
Schema Salad

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Salad is a schema language for describing JSON or YAML structured linked data documents. Salad schema describes rules for preprocessing, structural validation, and hyperlink checking for documents described by a Salad schema. Salad supports rich data modeling with inheritance, template specialization, object identifiers, object references, documentation generation, code generation, and transformation to [RDF](#). Salad provides a bridge between document and record oriented data modeling and the Semantic Web.

The Schema Salad library is Python 3.8+ only.

INSTALLATION

```
pip3 install schema_salad
```

If you intend to use the *schema-salad-tool --codegen=python* feature, please include the *[pycodegen]* extra:

```
pip3 install schema_salad[pycodegen]
```

To install from source:

```
git clone https://github.com/common-workflow-language/schema_salad
cd schema_salad
pip3 install .
# or pip3 install .[pycodegen] if needed
```


COMMANDS

Schema salad can be used as a command line tool or imported as a Python module:

```
$ schema-salad-tool
usage: schema-salad-tool [-h] [--rdf-serializer RDF_SERIALIZER] [--skip-schemas]
                        [--strict-foreign-properties] [--print-jsonld-context]
                        [--print-rdfs] [--print-avro] [--print-rdf] [--print-pre]
                        [--print-index] [--print-metadata] [--print-inheritance-dot]
                        [--print-fieldrefs-dot] [--codegen language] [--codegen-target
↳ CODEGEN_TARGET]
                        [--codegen-examples directory] [--codegen-package dotted.package]
                        [--codegen-copyright copyright_string] [--print-oneline]
                        [--print-doc] [--strict | --non-strict]
                        [--verbose | --quiet | --debug] [--only ONLY] [--redirect REDIRECT]
                        [--brand BRAND] [--brandlink BRANDLINK] [--brandstyle BRANDSTYLE]
                        [--brandinverse] [--primetype PRIMTYPE] [--version]
                        [schema] [document]

$ python
>>> import schema_salad
```

Validate a schema:

```
$ schema-salad-tool myschema.yml
```

Validate a document using a schema:

```
$ schema-salad-tool myschema.yml mydocument.yml
```

Generate HTML documentation:

```
$ schema-salad-tool --print-doc myschema.yml > myschema.html
$ # or
$ schema-salad-doc myschema.yml > myschema.html
```

Get JSON-LD context:

```
$ schema-salad-tool --print-jsonld-context myschema.yml mydocument.yml
```

Convert a document to JSON-LD:

```
$ schema-salad-tool --print-pre myschema.yml mydocument.yml > mydocument.jsonld
```

Generate Python classes for loading/generating documents described by the schema (Requires the *[pycodegen]* extra):

```
$ schema-salad-tool --codegen=python myschema.yml > myschema.py
```

Display inheritance relationship between classes as a graphviz 'dot' file and render as SVG:

```
$ schema-salad-tool --print-inheritance-dot myschema.yml | dot -Tsvg > myschema.svg
```

CODEGEN EXAMPLES

The examples in the tables below are helpful to see how to use the output of *schema-salad-tool --codegen* in different languages for loading and/or creating/editing/saving objects.

First set of examples is using the [CWL v1.2 schema](#):

| Lan- guage | Repository | Serialization Example Deserialization Example | |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------------------------------|
| Python | https://github.com/common-workflow-language/cwl-utils/ | <code>create_cwl_from_objects.py</code> | <code>load_document()</code> |
| Java | https://github.com/common-workflow-language/cwljava/ | (Not yet implemented) | <code>PackedWorkflow-ClassTest.java</code> |
| Type- Script | https://github.com/common-workflow-lab/cwl-ts-auto | Creating, editing, and saving CWL docs with TypeScript | Loading CWL documents with TypeScript |
| .Net | https://github.com/common-workflow-lab/CWLDotNet | Creating, editing, and saving CWL docs with .Net | Loading CWL documents with .Net |
| C++ | https://github.com/common-workflow-lab/cwl-cpp-auto | <code>cwl_output_example.cpp</code> | <code>cwl_input_example.cpp</code> |
| D | https://github.com/common-workflow-lab/cwl-d-auto | How to use | How to use |

Second set of examples is for the [Galaxy Workflow Format 2 schema](#):

| Language | Path |
|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Python | https://github.com/galaxyproject/gxformat2/blob/master/gxformat2/schema/v19_09.py |
| Java | https://github.com/galaxyproject/gxformat2/tree/master/java |
| TypeScript | https://github.com/galaxyproject/gxformat2/tree/master/typescript |

QUICK START

Let's say you have a 'basket' record that can contain items measured either by weight or by count. Here's an example:

```
basket:
- product: bananas
  price: 0.39
  per: pound
  weight: 1
- product: cucumbers
  price: 0.79
  per: item
  count: 3
```

We want to validate that all the expected fields are present, the measurement is known, and that “count” cannot be a fractional value. Here is an example schema to do that:

```
- name: Product
  doc: |
    The base type for a product. This is an abstract type, so it
    can't be used directly, but can be used to define other types.
  type: record
  abstract: true
  fields:
    product: string
    price: float

- name: ByWeight
  doc: |
    A product, sold by weight. Products may be sold by pound or by
    kilogram. Weights may be fractional.
  type: record
  extends: Product
  fields:
    per:
      type:
        type: enum
        symbols:
          - pound
          - kilogram
      jsonldPredicate: '#per'
    weight: float
```

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```
- name: ByCount
  doc: |
    A product, sold by count. The count must be a integer value.
  type: record
  extends: Product
  fields:
    per:
      type:
        type: enum
        symbols:
          - item
      jsonldPredicate: '#per'
    count: int

- name: Basket
  doc: |
    A basket of products. The 'documentRoot' field indicates it is a
    valid starting point for a document. The 'basket' field will
    validate subtypes of 'Product' (ByWeight and ByCount).
  type: record
  documentRoot: true
  fields:
    basket:
      type:
        type: array
        items: Product
```

You can check the schema and document in `schema_salad/tests/basket_schema.yml` and `schema_salad/tests/basket.yml`:

```
$ schema-salad-tool basket_schema.yml basket.yml
Document `basket.yml` is valid
```

DOCUMENTATION

See the [specification](#) and the [metaschema](#) (salad schema for itself). For an example application of Schema Salad see the Common Workflow [Language](#).

RATIONALE

The JSON data model is an popular way to represent structured data. It is attractive because of it's relative simplicity and is a natural fit with the standard types of many programming languages. However, this simplicity comes at the cost that basic JSON lacks expressive features useful for working with complex data structures and document formats, such as schemas, object references, and namespaces.

JSON-LD is a W3C standard providing a way to describe how to interpret a JSON document as Linked Data by means of a “context”. JSON-LD provides a powerful solution for representing object references and namespaces in JSON based on standard web URIs, but is not itself a schema language. Without a schema providing a well defined structure, it is difficult to process an arbitrary JSON-LD document as idiomatic JSON because there are many ways to express the same data that are logically equivalent but structurally distinct.

Several schema languages exist for describing and validating JSON data, such as JSON Schema and Apache Avro data serialization system, however none understand linked data. As a result, to fully take advantage of JSON-LD to build the next generation of linked data applications, one must maintain separate JSON schema, JSON-LD context, RDF schema, and human documentation, despite significant overlap of content and obvious need for these documents to stay synchronized.

Schema Salad is designed to address this gap. It provides a schema language and processing rules for describing structured JSON content permitting URI resolution and strict document validation. The schema language supports linked data through annotations that describe the linked data interpretation of the content, enables generation of JSON-LD context and RDF schema, and production of RDF triples by applying the JSON-LD context. The schema language also provides for robust support of inline documentation.

6.1 Command Line Options

6.1.1 schema-salad-tool

```
usage: schema-salad-tool [-h] [--rdf-serializer RDF_SERIALIZER]
                        [--skip-schemas] [--strict-foreign-properties]
                        [--print-jsonld-context] [--print-rdfs]
                        [--print-avro] [--print-rdf] [--print-pre]
                        [--print-index] [--print-metadata]
                        [--print-inheritance-dot] [--print-fieldrefs-dot]
                        [--codegen language]
                        [--codegen-target CODEGEN_TARGET]
                        [--codegen-examples directory]
                        [--codegen-package dotted.package]
                        [--codegen-copyright copyright_string]
                        [--codegen-spdx-copyright-text spdx_copyright_text [spdx_
```

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```

↪copyright_text ...]]
    [--codegen-spx-license-identifier spdx_license_identifier]
    [--codegen-parser-info parser_info] [--print-oneline]
    [--print-doc] [--strict | --non-strict]
    [--verbose | --quiet | --debug] [--only ONLY]
    [--redirect REDIRECT] [--brand BRAND]
    [--brandlink BRANDLINK] [--brandstyle BRANDSTYLE]
    [--brandinverse] [--primetype PRIMTYPE] [--version]
    [schema] [document ...]

```

schema

document

-h, --help

show this help message and exit

--rdf-serializer <rdf_serializer>

Output RDF serialization format used by `--print-rdf`(one of turtle (default), n3, nt, xml)

--skip-schemas

If specified, ignore \$schemas sections.

--strict-foreign-properties

Strict checking of foreign properties

--print-jsonld-context

Print JSON-LD context for schema

--print-rdfs

Print RDF schema

--print-avro

Print Avro schema

--print-rdf

Print corresponding RDF graph for document

--print-pre

Print document after preprocessing

--print-index

Print node index

--print-metadata

Print document metadata

--print-inheritance-dot

Print graphviz file of inheritance

--print-fieldrefs-dot

Print graphviz file of field refs

--codegen <language>

Generate classes in target language, currently supported: python, java, typescript, dotnet, cpp, dlang

--codegen-target <codegen_target>
 Defaults to sys.stdout for Python/C++/Dlang and ./ for Java/TypeScript/.Net

--codegen-examples <directory>
 Directory of example documents for test case generation (Java/TypeScript/.Net/Dlang only).

--codegen-package <dotted.package>
 Optional override of the package name which is other derived from the base URL (Java/TypeScript/.Net/Dlang only).

--codegen-copyright <copyright_string>
 Optional copyright of the input schema.

--codegen-spdx-copyright-text <spdx_copyright_text>
 List of copyright text. Each entry will show up as ‘SPDX-FileCopyrightText: ...’ (Currently c++ only)

--codegen-spdx-license-identifier <spdx_license_identifier>
 Optional spdx license identifier, e.g.: GPL-3.0-only (Currently c++ only)

--codegen-parser-info <parser_info>
 Optional parser name which is accessible via resulted parser API (Python and Dlang only)

--print-oneline
 Print each error message in oneline

--print-doc
 Print HTML schema documentation page

--strict
 Strict validation (unrecognized or out of place fields are error)

--non-strict
 Lenient validation (ignore unrecognized fields)

--verbose
 Default logging

--quiet
 Only print warnings and errors.

--debug
 Print even more logging

--only <only>
 Use with -print-doc, document only listed types

--redirect <redirect>
 Use with -print-doc, override default link for type

--brand <brand>
 Use with -print-doc, set the ‘brand’ text in nav bar

--brandlink <brandlink>
 Use with -print-doc, set the link for ‘brand’ in nav bar

--brandstyle <brandstyle>
 Use with -print-doc, HTML code to link to an external style sheet

--brandinverse

Use with `--print-doc`

--primetype <primetype>

Use with `--print-doc`, link to use for primitive types (string, int etc)

--version, -v

Print version

6.1.2 schema-salad-doc

```
usage: schema-salad-doc [-h] [--only ONLY] [--redirect REDIRECT]
                        [--brand BRAND] [--brandlink BRANDLINK]
                        [--brandstyle BRANDSTYLE] [--brandinverse]
                        [--primetype PRIMTYPE] [--debug]
                        schema
```

schema

-h, --help

show this help message and exit

--only <only>

--redirect <redirect>

--brand <brand>

--brandlink <brandlink>

--brandstyle <brandstyle>

--brandinverse

--primetype <primetype>

--debug

6.2 How to add new types to the local Typeshed

If when running `make mypy` you receive errors about modules that can't be found you may need to add type stubs for new modules to the `mypy-stubs/` directory.

```
stubgen -o mypy-stubs module_name
make mypy
```

Note: the module name is not always the name of the PyPI package (`CacheControl` vs `cachecontrol`).

Stubs are just that, you will still need to annotate whichever functions you call.

Oftentimes it is simpler to comment out imports in the `.pyi` stubs that are not needed yet. The goal is represent the public API, or at least the part we use.

6.3 API Reference

This page contains auto-generated API reference documentation¹.

6.3.1 schema_salad

A schema language for describing JSON or YAML structured linked data documents.

Subpackages

`schema_salad.avro`

Submodules

`schema_salad.avro.schema`

Contains the Schema classes.

A schema may be one of:

A record, mapping field names to field value data; An enum, containing one of a small set of symbols; An array of values, all of the same schema; A map of values, all of the same schema; A union of other schemas; A unicode string; A 32-bit signed int; A 64-bit signed long; A 32-bit floating-point float; A 64-bit floating-point double; A boolean; or Null.

Module Contents

Classes

| | |
|-------------------------|------------------------------------------------------|
| <i>Schema</i> | Base class for all Schema classes. |
| <i>Name</i> | Class to describe Avro name. |
| <i>Names</i> | Track name set and default namespace during parsing. |
| <i>NamedSchema</i> | Named Schemas specified in NAMED_TYPES. |
| <i>Field</i> | |
| <i>PrimitiveSchema</i> | Valid primitive types are in PRIMITIVE_TYPES. |
| <i>EnumSchema</i> | Named Schemas specified in NAMED_TYPES. |
| <i>ArraySchema</i> | Avro array schema class. |
| <i>MapSchema</i> | Avro map schema class. |
| <i>NamedMapSchema</i> | Avro named map schema class. |
| <i>UnionSchema</i> | Avro union schema class. |
| <i>NamedUnionSchema</i> | Avro named union schema class. |
| <i>RecordSchema</i> | Named Schemas specified in NAMED_TYPES. |

¹ Created with sphinx-autoapi

Functions

| | |
|----------------------------------------------------|-----------------------------------------------------------------------------|
| <i>get_other_props</i> (all_props, reserved_props) | Retrieve the non-reserved properties from a dictionary of properties. |
| <i>make_avsc_object</i> (json_data[, names]) | Build Avro Schema from data parsed out of JSON string. |
| <i>is_subtype</i> (types, existing, new) | Check if a new type specification is compatible with an existing type spec. |

Attributes

| |
|--------------------------------|
| <i>PRIMITIVE_TYPES</i> |
| <i>NAMED_TYPES</i> |
| <i>VALID_TYPES</i> |
| <i>SCHEMA_RESERVED_PROPS</i> |
| <i>JsonDataType</i> |
| <i>AtomicPropType</i> |
| <i>PropType</i> |
| <i>PropsType</i> |
| <i>FIELD_RESERVED_PROPS</i> |
| <i>VALID_FIELD_SORT_ORDERS</i> |

```
schema_salad.avro.schema.PRIMITIVE_TYPES = ('null', 'boolean', 'string', 'int', 'long',  
'float', 'double')
```

```
schema_salad.avro.schema.NAMED_TYPES = ('enum', 'record')
```

```
schema_salad.avro.schema.VALID_TYPES
```

```
schema_salad.avro.schema.SCHEMA_RESERVED_PROPS = ('type', 'name', 'namespace', 'fields',  
'items', 'names', 'symbols', 'values', 'doc')
```

```
schema_salad.avro.schema.JsonDataType
```

```
schema_salad.avro.schema.AtomicPropType
```

```
schema_salad.avro.schema.PropType
```

```
schema_salad.avro.schema.PropsType
```

```
schema_salad.avro.schema.FIELD_RESERVED_PROPS = ('default', 'name', 'doc', 'order',  
'type')
```

```
schema_salad.avro.schema.VALID_FIELD_SORT_ORDERS = ('ascending', 'descending', 'ignore')
```

```
exception schema_salad.avro.schema.AvroException(msg, sl=None, children=None,
                                                  bullet_for_children="")
```

Bases: [schema_salad.exceptions.SchemaException](#)

Indicates error with the provided schema definition.

Parameters

- **msg** (*str*) –
- **sl** (*Optional*[[schema_salad.sourceline.SourceLine](#)]) –
- **children** (*Optional*[*Sequence*[[SchemaSaladException](#)]]) –
- **bullet_for_children** (*str*) –

```
exception schema_salad.avro.schema.SchemaParseException(msg, sl=None, children=None,
                                                         bullet_for_children="")
```

Bases: [AvroException](#)

Indicates error with the provided schema definition.

Parameters

- **msg** (*str*) –
- **sl** (*Optional*[[schema_salad.sourceline.SourceLine](#)]) –
- **children** (*Optional*[*Sequence*[[SchemaSaladException](#)]]) –
- **bullet_for_children** (*str*) –

```
class schema_salad.avro.schema.Schema(atype, other_props=None)
```

Base class for all Schema classes.

Parameters

- **atype** (*str*) –
- **other_props** (*Optional*[*PropsType*]) –

```
property props: PropsType
```

Return type
PropsType

```
get_prop(key)
```

Parameters
key (*str*) –

Return type
Optional[*PropType*]

```
set_prop(key, value)
```

Parameters

- **key** (*str*) –
- **value** (*Optional*[*PropType*]) –

Return type

None

class schema_salad.avro.schema.**Name**(name_attr=None, space_attr=None, default_space=None)

Class to describe Avro name.

Parameters

- **name_attr** (Optional[str]) –
- **space_attr** (Optional[str]) –
- **default_space** (Optional[str]) –

property fullname: str | None

Return type

Optional[str]

get_space()

Back out a namespace from full name.

Return type

Optional[str]

class schema_salad.avro.schema.**Names**(default_namespace=None)

Track name set and default namespace during parsing.

Parameters

default_namespace (Optional[str]) –

has_name(name_attr, space_attr)

Parameters

- **name_attr** (str) –
- **space_attr** (Optional[str]) –

Return type

bool

get_name(name_attr, space_attr)

Fetch the stored schema for the given namespace.

Parameters

- **name_attr** (str) –
- **space_attr** (Optional[str]) –

Return type

Optional[NamedSchema]

add_name(name_attr, space_attr, new_schema)

Add a new schema object to the name set.

Parameters

- **name_attr** (str) – name value read in schema
- **space_attr** (Optional[str]) – namespace value read in schema.
- **new_schema** (NamedSchema) –

Returns

the Name that was just added.

Return type

Name

```
class schema_salad.avro.schema.NamedSchema(atype, name, namespace=None, names=None,
                                             other_props=None)
```

Bases: *Schema*

Named Schemas specified in NAMED_TYPES.

Parameters

- **atype** (*str*) –
- **name** (*str*) –
- **namespace** (*Optional[str]*) –
- **names** (*Optional[Names]*) –
- **other_props** (*Optional[PropsType]*) –

property **name**: *str*

Return type

str

```
class schema_salad.avro.schema.Field(atype, name, has_default, default=None, order=None, names=None,
                                      doc=None, other_props=None)
```

Parameters

- **atype** (*JsonDataType*) –
- **name** (*str*) –
- **has_default** (*bool*) –
- **default** (*Optional[Any]*) –
- **order** (*Optional[str]*) –
- **names** (*Optional[Names]*) –
- **doc** (*Optional[Union[str, List[str]]]*) –
- **other_props** (*Optional[PropsType]*) –

property **default**: *Any | None*

Return type

Optional[Any]

get_prop(*key*)

Parameters

- **key** (*str*) –

Return type

Optional[PropType]

set_prop(*key*, *value*)

Parameters

- **key** (*str*) –
- **value** (*Optional[PropType]*) –

Return type

None

class schema_salad.avro.schema.**PrimitiveSchema**(*atype*, *other_props=None*)

Bases: [Schema](#)

Valid primitive types are in PRIMITIVE_TYPES.

Parameters

- **atype** (*str*) –
- **other_props** (*Optional[PropsType]*) –

class schema_salad.avro.schema.**EnumSchema**(*name*, *namespace*, *symbols*, *names=None*, *doc=None*, *other_props=None*)

Bases: [NamedSchema](#)

Named Schemas specified in NAMED_TYPES.

Parameters

- **name** (*str*) –
- **namespace** (*Optional[str]*) –
- **symbols** (*List[str]*) –
- **names** (*Optional[Names]*) –
- **doc** (*Optional[Union[str, List[str]]]*) –
- **other_props** (*Optional[PropsType]*) –

property symbols: *List[str]*

Return type

List[str]

class schema_salad.avro.schema.**ArraySchema**(*items*, *names*, *other_props=None*)

Bases: [Schema](#)

Avro array schema class.

Parameters

- **items** (*JsonDataType*) –
- **names** (*Names*) –
- **other_props** (*Optional[PropsType]*) –

property items: [Schema](#)

Avro schema describing the array items' type.

Return type

[Schema](#)

class `schema_salad.avro.schema.MapSchema`(*values, names, other_props=None*)

Bases: [Schema](#)

Avro map schema class.

Parameters

- **values** (*JsonDataType*) –
- **names** (*Names*) –
- **other_props** (*Optional[PropsType]*) –

property values: [Schema](#)

Avro schema describing the map values' type.

Return type

[Schema](#)

class `schema_salad.avro.schema.NamedMapSchema`(*values, names, name, namespace=None, doc=None, other_props=None*)

Bases: [NamedSchema](#)

Avro named map schema class.

Parameters

- **values** (*JsonDataType*) –
- **names** (*Names*) –
- **name** (*str*) –
- **namespace** (*Optional[str]*) –
- **doc** (*Optional[Union[str, List[str]]]*) –
- **other_props** (*Optional[PropsType]*) –

property values: [Schema](#)

Avro schema describing the map values' type.

Return type

[Schema](#)

class `schema_salad.avro.schema.UnionSchema`(*schemas, names*)

Bases: [Schema](#)

Avro union schema class.

Parameters

- **schemas** (*List[JsonDataType]*) –

- **names** ([Names](#)) –

property schemas: [List\[Schema\]](#)

Avro schemas composing the Union type.

Return type

[List\[Schema\]](#)

```
class schema_salad.avro.schema.NamedUnionSchema(schemas, names, name, namespace=None,
                                                doc=None)
```

Bases: [NamedSchema](#)

Avro named union schema class.

Parameters

- **schemas** ([List\[JsonDataType\]](#)) –
- **names** ([Names](#)) –
- **name** ([str](#)) –
- **namespace** ([Optional\[str\]](#)) –
- **doc** ([Optional\[Union\[str, List\[str\]\]\]](#)) –

property schemas: [List\[Schema\]](#)

Return type

[List\[Schema\]](#)

```
class schema_salad.avro.schema.RecordSchema(name, namespace, fields, names, schema_type='record',
                                                doc=None, other_props=None)
```

Bases: [NamedSchema](#)

Named Schemas specified in NAMED_TYPES.

Parameters

- **name** ([str](#)) –
- **namespace** ([Optional\[str\]](#)) –
- **fields** ([List\[PropsType\]](#)) –
- **names** ([Names](#)) –
- **schema_type** ([str](#)) –
- **doc** ([Optional\[Union\[str, List\[str\]\]\]](#)) –
- **other_props** ([Optional\[PropsType\]](#)) –

property fields: [List\[Field\]](#)

Return type

[List\[Field\]](#)

```
static make_field_objects(field_data, names)
```

We're going to need to make message parameters too.

Parameters

- **field_data** (*List[PropType]*) –
- **names** (*Names*) –

Return type*List[Field]*

`schema_salad.avro.schema.get_other_props(all_props, reserved_props)`

Retrieve the non-reserved properties from a dictionary of properties.

Parameters

- **reserved_props** (*Tuple[str, Ellipsis]*) – The set of reserved properties to exclude
- **all_props** (*PropType*) –

Return type*Optional[PropType]*

`schema_salad.avro.schema.make_avsc_object(json_data, names=None)`

Build Avro Schema from data parsed out of JSON string.

Parameters

- **names** (*Optional[Names]*) – A Name object (tracks seen names and default space)
- **json_data** (*JsonDataType*) –

Return type*Schema*

`schema_salad.avro.schema.is_subtype(types, existing, new)`

Check if a new type specification is compatible with an existing type spec.

Parameters

- **types** (*Dict[str, Any]*) –
- **existing** (*PropType*) –
- **new** (*PropType*) –

Return type*bool*

`schema_salad.tests`

Submodules

`schema_salad.tests.conftest`

Module Contents**Functions**

`isolated_cache()`

Clear the schema_salad metaschema cache.

`schema_salad.tests.conftest.isolated_cache()`

Clear the `schema_salad` metaschema cache.

Auto-loaded (see `autouse`) fixture, loaded per test (function scope). Prevents issues when running multiple tests that load metaschemas multiple times or in parallel (*pytest-parallel*, *pytest-xdist*, etc).

Return type

None

`schema_salad.tests.matcher`

Module Contents

Classes

| | |
|------------------------|----------------------------------------------------------------------------------------------|
| <i>JsonDiffMatcher</i> | Raise <code>AssertionError</code> with a readable JSON diff when not <code>__eq__()</code> . |
|------------------------|----------------------------------------------------------------------------------------------|

Functions

| |
|-------------------------------|
| <i>StripYAMLComments(yml)</i> |
|-------------------------------|

class `schema_salad.tests.matcher.JsonDiffMatcher`(*expected*)

Raise `AssertionError` with a readable JSON diff when not `__eq__()`.

Used with `assert_called_with()` so it's possible for a human to see the differences between expected and actual call arguments that include non-trivial data structures.

Parameters

expected (*Any*) –

`__eq__`(*actual*)

Return `self==value`.

Parameters

actual (*Any*) –

Return type

`bool`

`schema_salad.tests.matcher.StripYAMLComments`(*yml*)

Parameters

yml (*str*) –

Return type

`Any`

`schema_salad.tests.test_avro_names`

Avro related tests.

Module Contents

Functions

| | |
|----------------------------------|--------------------------------------------------|
| <code>test_avro_loading()</code> | Confirm conversion of SALAD style names to avro. |
|----------------------------------|--------------------------------------------------|

`schema_salad.tests.test_avro_names.test_avro_loading()`

Confirm conversion of SALAD style names to avro.

Return type

None

`schema_salad.tests.test_cg`

Module Contents

Functions

| | |
|-----------------------------------------------------------|---------------------------------|
| <code>test_load()</code> | |
| <code>test_err()</code> | |
| <code>test_include()</code> | |
| <code>test_import()</code> | |
| <code>test_import2()</code> | |
| <code>test_err2()</code> | |
| <code>test_idmap()</code> | |
| <code>test_idmap2()</code> | |
| <code>test_load_pt()</code> | |
| <code>test_shortcode()</code> | Test shortcode() function. |
| <code>metaschema_pre()</code> | Prep-parsed schema for testing. |
| <code>test_load_metaschema(metaschema_pre)</code> | |
| <code>test_load_by_yaml_metaschema(metaschema_pre)</code> | |
| <code>test_load_cwlschema()</code> | |

Attributes

maxDiff

`schema_salad.tests.test_cg.test_load()`

Return type

None

`schema_salad.tests.test_cg.test_err()`

Return type

None

`schema_salad.tests.test_cg.test_include()`

Return type

None

`schema_salad.tests.test_cg.test_import()`

Return type

None

`schema_salad.tests.test_cg.maxDiff`

`schema_salad.tests.test_cg.test_import2()`

Return type

None

`schema_salad.tests.test_cg.test_err2()`

Return type

None

`schema_salad.tests.test_cg.test_idmap()`

Return type

None

`schema_salad.tests.test_cg.test_idmap2()`

Return type

None

`schema_salad.tests.test_cg.test_load_pt()`

Return type

None

`schema_salad.tests.test_cg.test_shortcode()`

Test shortcode() function.

Return type

None

`schema_salad.tests.test_cg.metaschema_pre()`

Prep-parsed schema for testing.

Return type

Any

`schema_salad.tests.test_cg.test_load_metaschema(metaschema_pre)`

Parameters

metaschema_pre (Any) –

Return type

None

`schema_salad.tests.test_cg.test_load_by_yaml_metaschema(metaschema_pre)`

Parameters

metaschema_pre (Any) –

Return type

None

`schema_salad.tests.test_cg.test_load_cwlschema()`

Return type

None

`schema_salad.tests.test_cli_args`

test different sets of command line arguments

Module Contents

Functions

`captured_output()`

`test_version()`

`test_empty_input()`

`schema_salad.tests.test_cli_args.captured_output()`

Return type

Iterator[Tuple[io.StringIO, io.StringIO]]

`schema_salad.tests.test_cli_args.test_version()`

Return type

None

`schema_salad.tests.test_cli_args.test_empty_input()`

Return type

None

`schema_salad.tests.test_codegen_errors`

Tests of helpful error messages.

Module Contents

Functions

| |
|-----------------------------------------------------------------------|
| <code>test_error_message1(tmp_path)</code> |
| <code>test_error_message2(tmp_path)</code> |
| <code>test_error_message4(tmp_path)</code> |
| <code>test_error_message5(tmp_path)</code> |
| <code>test_error_message6(tmp_path)</code> |
| <code>test_error_message7(tmp_path)</code> |
| <code>test_error_message8(tmp_path)</code> |
| <code>test_error_message9(tmp_path)</code> |
| <code>test_error_message10(tmp_path)</code> |
| <code>test_error_message11(tmp_path)</code> |
| <code>test_error_message15(tmp_path)</code> |
| <code>load_document_by_uri(tmp_path, path)</code> |
| <code>python_codegen(file_uri, target[, parser_info, package])</code> |

`schema_salad.tests.test_codegen_errors.test_error_message1(tmp_path)`

Parameters

tmp_path (*pathlib.Path*) –

Return type

None

`schema_salad.tests.test_codegen_errors.test_error_message2(tmp_path)`

Parameters

tmp_path (*pathlib.Path*) –

Return type

None

`schema_salad.tests.test_codegen_errors.test_error_message4(tmp_path)`

Parameters**tmp_path** (*pathlib.Path*) –**Return type**

None

`schema_salad.tests.test_codegen_errors.test_error_message5(tmp_path)`**Parameters****tmp_path** (*pathlib.Path*) –**Return type**

None

`schema_salad.tests.test_codegen_errors.test_error_message6(tmp_path)`**Parameters****tmp_path** (*pathlib.Path*) –**Return type**

None

`schema_salad.tests.test_codegen_errors.test_error_message7(tmp_path)`**Parameters****tmp_path** (*pathlib.Path*) –**Return type**

None

`schema_salad.tests.test_codegen_errors.test_error_message8(tmp_path)`**Parameters****tmp_path** (*pathlib.Path*) –**Return type**

None

`schema_salad.tests.test_codegen_errors.test_error_message9(tmp_path)`**Parameters****tmp_path** (*pathlib.Path*) –**Return type**

None

`schema_salad.tests.test_codegen_errors.test_error_message10(tmp_path)`**Parameters****tmp_path** (*pathlib.Path*) –**Return type**

None

`schema_salad.tests.test_codegen_errors.test_error_message11(tmp_path)`**Parameters****tmp_path** (*pathlib.Path*) –**Return type**

None

`schema_salad.tests.test_codegen_errors.test_error_message15(tmp_path)`

Parameters

`tmp_path` (*pathlib.Path*) –

Return type

None

`schema_salad.tests.test_codegen_errors.load_document_by_uri(tmp_path, path)`

Parameters

- `tmp_path` (*pathlib.Path*) –
- `path` (*Union[str, pathlib.Path]*) –

Return type

Any

`schema_salad.tests.test_codegen_errors.python_codegen(file_uri, target, parser_info=None, package=None)`

Parameters

- `file_uri` (*str*) –
- `target` (*pathlib.Path*) –
- `parser_info` (*Optional[str]*) –
- `package` (*Optional[str]*) –

Return type

None

`schema_salad.tests.test_cpp_codegen`

Test C++ code generation.

Module Contents

Functions

| | |
|------------------------------------------------------------------------|-------------------------------------------------------------|
| <code>test_cwl_cpp_gen(tmp_path)</code> | End to end test of C++ generator using the CWL v1.0 schema. |
| <code>test_cwl_cpp_generations(tmp_path, filename)</code> | End to end test of C++ generator using small scenarios. |
| <code>test_cwl_cpp_generations_with_spdx(tmp_path)</code> | End to end test of C++ generator checking for SPDX headers |
| <code>cpp_codegen(file_uri, target[, spdx_copyright_text, ...])</code> | Help using the C++ code generation function. |

`schema_salad.tests.test_cpp_codegen.test_cwl_cpp_gen(tmp_path)`

End to end test of C++ generator using the CWL v1.0 schema.

Parameters

`tmp_path` (*pathlib.Path*) –

Return type

None

`schema_salad.tests.test_cpp_codegen.test_cwl_cpp_generations(tmp_path, filename)`

End to end test of C++ generator using small scenarios.

Parameters

- **tmp_path** (*pathlib.Path*) –
- **filename** (*str*) –

Return type

None

`schema_salad.tests.test_cpp_codegen.test_cwl_cpp_generations_with_spdx(tmp_path)`

End to end test of C++ generator checking for SPDX headers

Parameters

tmp_path (*pathlib.Path*) –

Return type

None

`schema_salad.tests.test_cpp_codegen.cpp_codegen(file_uri, target, sdx_copyright_text=None, sdx_license_identifier=None)`

Help using the C++ code generation function.

Parameters

- **file_uri** (*str*) –
- **target** (*pathlib.Path*) –
- **sdx_copyright_text** (*Optional[List[str]*) –
- **sdx_license_identifier** (*Optional[str]*) –

Return type

None

`schema_salad.tests.test_cwl11`

Ensure codegen-produced parsers accept \$schemas directives

run individually as `py.test -k test_cwl11`

Module Contents**Functions**

`cwl_v1_2_schema(tmp_path_factory)`

`load_cwl(cwl_v1_2_schema, src)`

| | |
|---------------------------------------------------|-------------------|
| <code>test_secondaryFiles(cwl_v1_2_schema)</code> | secondaryFiles |
| <code>test_outputBinding(cwl_v1_2_schema)</code> | secondaryFiles |
| <code>test_yaml_tab_error(cwl_v1_2_schema)</code> | Tabs in the file. |

Attributes

| |
|----------------------------|
| <code>test_dir_name</code> |
| <code>SchemaType</code> |

```
schema_salad.tests.test_cwl11.test_dir_name = 'tests/'
```

```
schema_salad.tests.test_cwl11.SchemaType
```

```
schema_salad.tests.test_cwl11.cwl_v1_2_schema(tmp_path_factory)
```

Parameters

`tmp_path_factory` (`_pytest.tmpdir.TempPathFactory`) –

Return type

`Generator[SchemaType, None, None]`

```
schema_salad.tests.test_cwl11.load_cwl(cwl_v1_2_schema, src)
```

Parameters

- `cwl_v1_2_schema` (`SchemaType`) –

- `src` (`str`) –

Return type

`Tuple[Any, Dict[str, Any]]`

```
schema_salad.tests.test_cwl11.test_secondaryFiles(cwl_v1_2_schema)
```

`secondaryFiles`

Parameters

`cwl_v1_2_schema` (`SchemaType`) –

Return type

`None`

```
schema_salad.tests.test_cwl11.test_outputBinding(cwl_v1_2_schema)
```

`secondaryFiles`

Parameters

`cwl_v1_2_schema` (`SchemaType`) –

Return type

`None`

```
schema_salad.tests.test_cwl11.test_yaml_tab_error(cwl_v1_2_schema)
```

Tabs in the file.

Parameters

`cwl_v1_2_schema` (`SchemaType`) –

Return type

`None`

schema_salad.tests.test_dlang_codegen

Test D code generation.

Module Contents

Functions

| | |
|----------------------------------------------|-----------------------------------------------------------|
| <code>test_cwl_dlang_gen(tmp_path)</code> | End to end test of D generator using the CWL v1.0 schema. |
| <code>dlang_codegen(file_uri, target)</code> | Help using the D code generation function. |

schema_salad.tests.test_dlang_codegen.test_cwl_dlang_gen(tmp_path)

End to end test of D generator using the CWL v1.0 schema.

Parameters

tmp_path (*pathlib.Path*) –

Return type

None

schema_salad.tests.test_dlang_codegen.dlang_codegen(file_uri, target)

Help using the D code generation function.

Parameters

- **file_uri** (*str*) –
- **target** (*pathlib.Path*) –

Return type

None

schema_salad.tests.test_dotnet_codegen

Module Contents

Functions

| |
|-----------------------------------------------------------|
| <code>test_cwl_gen(tmp_path)</code> |
| <code>test_meta_schema_gen(tmp_path)</code> |
| <code>test_class_field(tmp_path)</code> |
| <code>get_data_uri(resource_path)</code> |
| <code>dotnet_codegen(file_uri, target[, examples])</code> |

Attributes

`cwl_file_uri`

`metaschema_file_uri`

`schema_salad.tests.test_dotnet_codegen.test_cwl_gen(tmp_path)`

Parameters

tmp_path (`pathlib.Path`) –

Return type

None

`schema_salad.tests.test_dotnet_codegen.test_meta_schema_gen(tmp_path)`

Parameters

tmp_path (`pathlib.Path`) –

Return type

None

`schema_salad.tests.test_dotnet_codegen.test_class_field(tmp_path)`

Parameters

tmp_path (`pathlib.Path`) –

Return type

None

`schema_salad.tests.test_dotnet_codegen.get_data_uri(resource_path)`

Parameters

resource_path (`str`) –

Return type

`str`

`schema_salad.tests.test_dotnet_codegen.cwl_file_uri`

`schema_salad.tests.test_dotnet_codegen.metaschema_file_uri`

`schema_salad.tests.test_dotnet_codegen.dotnet_codegen(file_uri, target, examples=None)`

Parameters

- **file_uri** (`str`) –
- **target** (`pathlib.Path`) –
- **examples** (`Optional[pathlib.Path]`) –

Return type

None

schema_salad.tests.test_errors

Tests of helpful error messages.

Module Contents**Functions**

| | |
|--------------------------------------------------------|------------------------------------------------------------------------------------------------|
| <code>test_errors()</code> | |
| <code>test_error_message1()</code> | |
| <code>test_error_message2()</code> | |
| <code>test_error_message3()</code> | |
| <code>test_error_message4()</code> | |
| <code>test_error_message5()</code> | |
| <code>test_error_message7()</code> | |
| <code>test_error_message8()</code> | |
| <code>test_error_message9()</code> | |
| <code>test_error_message10()</code> | |
| <code>test_error_message11()</code> | |
| <code>test_error_message15()</code> | |
| <code>test_errors_previously_defined_dict_key()</code> | |
| <code>test_bad_schema()</code> | |
| <code>test_bad_schema2()</code> | |
| <code>test_namespaces_type()</code> | Confirm helpful error message when \$namespaces is the wrong type. |
| <code>test_namespaces_undeclared(caplog)</code> | Confirm warning message a namespace is used but not declared. |
| <code>test_not_a_namespace1(caplog)</code> | Confirm no warning when relative id contains a colon but prefix doesn't look like a namespace. |
| <code>test_not_a_namespace2(caplog)</code> | Confirm no warning when relative id contains a colon but prefix doesn't look like a namespace. |
| <code>test_not_a_namespace3(caplog)</code> | Confirm no warning when relative id starts with a colon. |
| <code>test_schemas_type()</code> | Confirm helpful error message when \$schemas is the wrong type. |

`schema_salad.tests.test_errors.test_errors()`

Return type

None

`schema_salad.tests.test_errors.test_error_message1()`

Return type

None

`schema_salad.tests.test_errors.test_error_message2()`

Return type

None

`schema_salad.tests.test_errors.test_error_message3()`

Return type

None

`schema_salad.tests.test_errors.test_error_message4()`

Return type

None

`schema_salad.tests.test_errors.test_error_message5()`

Return type

None

`schema_salad.tests.test_errors.test_error_message7()`

Return type

None

`schema_salad.tests.test_errors.test_error_message8()`

Return type

None

`schema_salad.tests.test_errors.test_error_message9()`

Return type

None

`schema_salad.tests.test_errors.test_error_message10()`

Return type

None

`schema_salad.tests.test_errors.test_error_message11()`

Return type

None

`schema_salad.tests.test_errors.test_error_message15()`

Return type

None

`schema_salad.tests.test_errors.test_errors_previously_defined_dict_key()`

Return type

None

`schema_salad.tests.test_errors.test_bad_schema()`

Return type

None

`schema_salad.tests.test_errors.test_bad_schema2()`

Return type

None

`schema_salad.tests.test_errors.test_namespaces_type()`

Confirm helpful error message when \$namespaces is the wrong type.

Return type

None

`schema_salad.tests.test_errors.test_namespaces_undeclared(caplog)`

Confirm warning message a namespace is used but not declared.

Parameters

caplog (*pytest.LogCaptureFixture*) –

Return type

None

`schema_salad.tests.test_errors.test_not_a_namespace1(caplog)`

Confirm no warning when relative id contains a colon but prefix doesn't look like a namespace.

Parameters

caplog (*pytest.LogCaptureFixture*) –

Return type

None

`schema_salad.tests.test_errors.test_not_a_namespace2(caplog)`

Confirm no warning when relative id contains a colon but prefix doesn't look like a namespace.

Parameters

caplog (*pytest.LogCaptureFixture*) –

Return type

None

`schema_salad.tests.test_errors.test_not_a_namespace3(caplog)`

Confirm no warning when relative id starts with a colon.

Parameters

caplog (*pytest.LogCaptureFixture*) –

Return type

None

`schema_salad.tests.test_errors.test_schemas_type()`

Confirm helpful error message when \$schemas is the wrong type.

Return type

None

`schema_salad.tests.test_examples`

Test examples.

Module Contents

Functions

| | |
|----------------------------------------------------|------------------------------------------------------------------------|
| <code>test_schemas()</code> | |
| <code>test_bad_schemas(caplog)</code> | Test that bad \$schemas refs don't stop parsing. |
| <code>test_skip_bad_schemas(caplog)</code> | Test that (bad) \$schemas refs are properly skipped. |
| <code>test_self_validate()</code> | |
| <code>test_print_rdf()</code> | Test --print-rdf. |
| <code>test_print_rdf_invalid_external_ref()</code> | Test --print-rdf when document references unfetchable external schema. |
| <code>test_print_pre_schema()</code> | Test --print-pre only schema. |
| <code>test_print_pre()</code> | Test --print-pre. |
| <code>test_print_schema_index()</code> | Test --print-index only with a schema. |
| <code>test_print_index()</code> | Test --print-index. |
| <code>test_print_schema_metadata()</code> | Test --print-metadata only for a schema. |
| <code>test_print_metadata()</code> | Test --print-metadata. |
| <code>test_schema_salad_doc_online_doc()</code> | Test schema-salad-doc when the 1st type has only a single doc line. |
| <code>test_avro_regression()</code> | |
| <code>test_jsonld_ctx()</code> | |
| <code>test_idmap()</code> | |
| <code>test_scoped_ref()</code> | |
| <code>test_examples()</code> | |
| <code>test_yaml_float_test()</code> | |
| <code>test_typedsl_ref()</code> | |
| <code>test_nested_typedsl_ref()</code> | |
| <code>test_secondaryFile_dsl_ref()</code> | |
| <code>test_scoped_id()</code> | |
| <code>test_rdf_datetime()</code> | Affirm that datetime objects can be serialized in mak-erdf(). |
| <code>test_yaml_datetime()</code> | Affirm that yaml_no_ts prevents the creation of datetime objects. |

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Table 1 – continued from previous page

| | |
|------------------------------------|-----------------------------------|
| <code>test_subscoped_id()</code> | |
| <code>test_mixin()</code> | |
| <code>test_fragment()</code> | |
| <code>test_file_uri()</code> | |
| <code>test_sourceline()</code> | |
| <code>test_cmap()</code> | |
| <code>test_blank_node_id()</code> | |
| <code>test_can_use_Any()</code> | Test that 'type: Any' can be used |
| <code>test_nullable_links()</code> | |

`schema_salad.tests.test_examples.test_schemas()`

Return type

None

`schema_salad.tests.test_examples.test_bad_schemas(caplog)`

Test that bad \$schemas refs don't stop parsing.

Parameters

caplog (*pytest.LogCaptureFixture*) –

Return type

None

`schema_salad.tests.test_examples.test_skip_bad_schemas(caplog)`

Test that (bad) \$schemas refs are properly skipped.

Parameters

caplog (*pytest.LogCaptureFixture*) –

Return type

None

`schema_salad.tests.test_examples.test_self_validate()`

Return type

None

`schema_salad.tests.test_examples.test_print_rdf()`

Test -print-rdf.

Return type

None

`schema_salad.tests.test_examples.test_print_rdf_invalid_external_ref()`

Test -print-rdf when document references unfetchable external schema.

Return type

None

`schema_salad.tests.test_examples.test_print_pre_schema()`

Test `-print-pre` only schema.

Return type

None

`schema_salad.tests.test_examples.test_print_pre()`

Test `-print-pre`.

Return type

None

`schema_salad.tests.test_examples.test_print_schema_index()`

Test `-print-index` only with a schema.

Return type

None

`schema_salad.tests.test_examples.test_print_index()`

Test `-print-index`.

Return type

None

`schema_salad.tests.test_examples.test_print_schema_metadata()`

Test `-print-metadata` only for a schema.

Return type

None

`schema_salad.tests.test_examples.test_print_metadata()`

Test `-print-metadata`.

Return type

None

`schema_salad.tests.test_examples.test_schema_salad_doc_online_doc()`

Test `schema-salad-doc` when the 1st type has only a single doc line.

Return type

None

`schema_salad.tests.test_examples.test_avro_regression()`

Return type

None

`schema_salad.tests.test_examples.test_jsonld_ctx()`

Return type

None

`schema_salad.tests.test_examples.test_idmap()`

Return type

None

`schema_salad.tests.test_examples.test_scoped_ref()`

Return type

None

`schema_salad.tests.test_examples.test_examples()`

Return type

None

`schema_salad.tests.test_examples.test_yaml_float_test()`

Return type

None

`schema_salad.tests.test_examples.test_typedsl_ref()`

Return type

None

`schema_salad.tests.test_examples.test_nested_typedsl_ref()`

Return type

None

`schema_salad.tests.test_examples.test_secondaryFile_dsl_ref()`

Return type

None

`schema_salad.tests.test_examples.test_scoped_id()`

Return type

None

`schema_salad.tests.test_examples.test_rdf_datetime()`

Affirm that datetime objects can be serialized in makerdf().

Return type

None

`schema_salad.tests.test_examples.test_yaml_datetime()`

Affirm that `yaml_no_ts` prevents the creation of datetime objects.

Return type

None

`schema_salad.tests.test_examples.test_subscoped_id()`

Return type

None

`schema_salad.tests.test_examples.test_mixin()`

Return type

None

`schema_salad.tests.test_examples.test_fragment()`

Return type

None

`schema_salad.tests.test_examples.test_file_uri()`

Return type

None

`schema_salad.tests.test_examples.test_sourceline()`

Return type

None

`schema_salad.tests.test_examples.test_cmap()`

Return type

None

`schema_salad.tests.test_examples.test_blank_node_id()`

Return type

None

`schema_salad.tests.test_examples.test_can_use_Any()`

Test that ‘type: Any’ can be used

Return type

None

`schema_salad.tests.test_examples.test_nullable_links()`

Return type

None

`schema_salad.tests.test_fetch`

Module Contents

Classes

| | |
|-----------------------------|----------------------------|
| <code>testFetcher</code> | Fetch resources from URIs. |
| <code>CWLTestFetcher</code> | Fetch resources from URIs. |

Functions

| |
|-----------------------------|
| <code>test_fetcher()</code> |
| <code>test_cache()</code> |

class `schema_salad.tests.test_fetch.testFetcher(cache, session)`

Bases: `schema_salad.fetcher.Fetcher`

Fetch resources from URIs.

Parameters

- **cache** (`schema_salad.utils.CacheType`) –
- **session** (`Optional[requests.sessions.Session]`) –

fetch_text(*url*, *content_types*=None)

Retrieve the given resource as a string.

Parameters

- **url** (*str*) –
- **content_types** (*Optional[List[str]*) –

Return type

str

check_exists(*url*)

Check if the given resource exists.

Parameters

- **url** (*str*) –

Return type

bool

urljoin(*base*, *url*)

Construct a full (“absolute”) URL by combining a “base URL” with another URL.

Parameters

- **base** (*str*) –
- **url** (*str*) –

Return type

str

class `schema_salad.tests.test_fetch.CWLTestFetcher`(*cache*, *session*)

Bases: `schema_salad.fetcher.Fetcher`

Fetch resources from URIs.

Parameters

- **cache** (`schema_salad.utils.CacheType`) –
- **session** (*Optional[requests.sessions.Session]*) –

fetch_text(*url*, *content_types*=None)

Retrieve the given resource as a string.

Parameters

- **url** (*str*) –
- **content_types** (*Optional[List[str]*) –

Return type

str

check_exists(*url*)

Check if the given resource exists.

Parameters

- **url** (*str*) –

Return type

bool

urljoin(*base*, *url*)

Construct a full (“absolute”) URL by combining a “base URL” with another URL.

Parameters

- **base** (*str*) –
- **url** (*str*) –

Return type

str

`schema_salad.tests.test_fetch.test_fetcher()`

Return type

None

`schema_salad.tests.test_fetch.test_cache()`

Return type

None

`schema_salad.tests.test_fp`

Module Contents

Functions

test_fp()

`schema_salad.tests.test_fp.test_fp()`

Return type

None

`schema_salad.tests.test_java_codegen`

Module Contents

Functions

test_cwl_gen(tmp_path)

test_meta_schema_gen(tmp_path)

java_codegen(file_uri, target[, examples])

`schema_salad.tests.test_java_codegen.test_cwl_gen(tmp_path)`

Parameters

`tmp_path` (*pathlib.Path*) –

Return type

None

`schema_salad.tests.test_java_codegen.test_meta_schema_gen(tmp_path)`

Parameters

`tmp_path` (*pathlib.Path*) –

Return type

None

`schema_salad.tests.test_java_codegen.java_codegen(file_uri, target, examples=None)`

Parameters

- `file_uri` (*str*) –
- `target` (*pathlib.Path*) –
- `examples` (*Optional[pathlib.Path]*) –

Return type

None

`schema_salad.tests.test_makedoc`

Test schema-salad-doc.

(also known as `schema-salad-tool --print-doc`)

For convenience, tests are checking exact strings. In the event of changes in the “mistune” package, `makedoc.py`, or other changes, feel free to modify the test strings as long as the new HTML renders the same way in typical browsers.

Likewise, if the schema-salad metaschema changes and it is missing one or more of the features tested below, then please copy those old features to a new file and update the affected tests to use those new file(s).

Module Contents

Functions

| | |
|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| <code>test_schema_salad_inherit_docs()</code> | Test schema-salad-doc when types inherit and override values from parent types. |
| <code>generate_doc([schema_data])</code> | Avoid error when calling fixture directly. |
| <code>fixture metaschema_doc()</code> | Pytest Fixture of the rendered HTML for the metaschema schema. |
| <code>test_doc_fenced_code_contents_preserved()</code> | Fenced code contents are not interpreted as Markdown definitions and converted into erroneous HTML. |
| <code>test_doc_headings_target_anchor(metaschema_doc)</code> | Doc headers must have an id and section link. |
| <code>test_doc_render_table_of_contents(metaschema_doc)</code> | The special Table of Contents token must be replaced with a rendered table. |
| <code>test_plain_links_autolinked(metaschema_doc)</code> | Plain links should be treated as if they were wrapped in angle brackets. |
| <code>test_embedded_html_unescaped()</code> | Raw HTML shouldn't get escaped. |
| <code>test_multiline_list_entries_word_spacing(metaschema_doc)</code> | Hanging indents in Markdown lists don't lead to wordsmushing. |
| <code>test_multiline_list_entries_without_indentation(metaschema_doc)</code> | Hanging indents are not required in Markdown lists. |
| <code>test_detect_changes_in_html(metaschema_doc, tmp_path)</code> | Catch all for changes in HTML output, please adjust if the changes are innocent. |

`schema_salad.tests.test_makedoc.test_schema_salad_inherit_docs()`

Test schema-salad-doc when types inherit and override values from parent types.

Return type

None

`schema_salad.tests.test_makedoc.generate_doc(schema_data=None)`

Avoid error when calling fixture directly.

Parameters

`schema_data` (Optional[str]) –

Return type

str

`schema_salad.tests.test_makedoc.fixture_metaschema_doc()`

Pytest Fixture of the rendered HTML for the metaschema schema.

Return type

str

`schema_salad.tests.test_makedoc.test_doc_fenced_code_contents_preserved()`

Fenced code contents are not interpreted as Markdown definitions and converted into erroneous HTML.

An example of problem case is when a definition looks like a Markdown list (e.g.: a YAML array). It must not be converted into HTML contents with list tags. However, special characters (e.g.: <, >) must still be escaped, otherwise they will not be correctly rendered within an HTML <pre><code> block.

Return type

None

`schema_salad.tests.test_makedoc.test_doc_headings_target_anchor(metaschema_doc)`

Doc headers must have an id and section link.

Parameters

`metaschema_doc` (str) –

Return type

None

`schema_salad.tests.test_makedoc.test_doc_render_table_of_contents(metaschema_doc)`

The special Table of Contents token must be replaced with a rendered table.

Parameters

`metaschema_doc` (*str*) –

Return type

None

`schema_salad.tests.test_makedoc.test_plain_links_autolinked(metaschema_doc)`

Plan links should be treated as if they were wrapped in angle brackets.

Parameters

`metaschema_doc` (*str*) –

Return type

None

`schema_salad.tests.test_makedoc.test_embedded_html_unescaped()`

Raw HTML shouldn't get escaped.

Return type

None

`schema_salad.tests.test_makedoc.test_multiline_list_entries_word_spacing(metaschema_doc)`

Hanging indents in Markdown lists don't lead to wordsmushing.

Parameters

`metaschema_doc` (*str*) –

Return type

None

`schema_salad.tests.test_makedoc.test_multiline_list_entries_without_indentation(metaschema_doc)`

Hanging indents are not required in Markdown lists.

Parameters

`metaschema_doc` (*str*) –

Return type

None

`schema_salad.tests.test_makedoc.test_detect_changes_in_html(metaschema_doc, tmp_path)`

Catch all for changes in HTML output, please adjust if the changes are innocent.

Parameters

- **`metaschema_doc`** (*str*) –
- **`tmp_path`** (*pathlib.Path*) –

Return type

None

`schema_salad.tests.test_misc`

Module Contents

Functions

| |
|--------------------------|
| <code>test_misc()</code> |
|--------------------------|

| |
|---------------------------------------|
| <code>test_load_schema_cache()</code> |
|---------------------------------------|

`schema_salad.tests.test_misc.test_misc()`

Return type

None

`schema_salad.tests.test_misc.test_load_schema_cache()`

Return type

None

`schema_salad.tests.test_pickling`

Tests to ensure that mypyc compiled classes are still pickleable.

See https://mypy.readthedocs.io/en/latest/differences_from_python.html#pickling-and-copying-objects

Module Contents

Functions

| | |
|---------------------------------------------------------|-------------------------------------------|
| <code>test_recordschema_pickle()</code> | Targeted test of pickling a RecordSchema. |
| <code>test_extend_and_specialize_enums(tmp_path)</code> | |

`schema_salad.tests.test_pickling.test_recordschema_pickle()`

Targeted test of pickling a RecordSchema.

Return type

None

`schema_salad.tests.test_pickling.test_extend_and_specialize_enums(tmp_path)`

Parameters

tmp_path (*pathlib.Path*) –

Return type

None

`schema_salad.tests.test_print_online`

Module Contents

Functions

`test_print_online()`

`test_print_online_for_invalid_yaml()`

`test_print_online_for_errors_in_the_same_line()`

`test_print_online_for_errors_in_resolve_ref()`

`test_for_invalid_yaml1()`

`test_for_invalid_yaml2()`

`schema_salad.tests.test_print_online.test_print_online()`

Return type

None

`schema_salad.tests.test_print_online.test_print_online_for_invalid_yaml()`

Return type

None

`schema_salad.tests.test_print_online.test_print_online_for_errors_in_the_same_line()`

Return type

None

`schema_salad.tests.test_print_online.test_print_online_for_errors_in_resolve_ref()`

Return type

None

`schema_salad.tests.test_print_online.test_for_invalid_yaml1()`

Return type

None

`schema_salad.tests.test_print_online.test_for_invalid_yaml2()`

Return type

None

`schema_salad.tests.test_python_codegen`

Module Contents

Functions

| | |
|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| <code>test_safe_identifiers()</code> | Affirm correct construction of identifiers safe for Python. |
| <code>test_cwl_gen(tmp_path)</code> | |
| <code>test_meta_schema_gen(tmp_path)</code> | |
| <code>test_meta_schema_gen_up_to_date(tmp_path)</code> | |
| <code>test_meta_schema_gen_no_base(tmp_path)</code> | |
| <code>python_codegen(file_uri, target[, parser_info, package])</code> | |
| <code>test_default_parser_info(tmp_path)</code> | |
| <code>test_parser_info(tmp_path)</code> | |
| <code>test_use_of_package_for_parser_info(tmp_path)</code> | |
| <code>test_graph_property()</code> | Test the RDFLib Graph representation of the <i>\$schemas</i> directive. |
| <code>test_graph_property_cache()</code> | Test that LoadingOptions properly cache the <i>\$schemas</i> RDFLib Graph representations. |
| <code>test_graph_property_empty_schema()</code> | Test that an empty RDFLib Graph is returned when not <i>\$schemas</i> directive is present. |

`schema_salad.tests.test_python_codegen.test_safe_identifiers()`

Affirm correct construction of identifiers safe for Python.

Return type

None

`schema_salad.tests.test_python_codegen.test_cwl_gen(tmp_path)`

Parameters

tmp_path (*pathlib.Path*) –

Return type

None

`schema_salad.tests.test_python_codegen.test_meta_schema_gen(tmp_path)`

Parameters

tmp_path (*pathlib.Path*) –

Return type

None

`schema_salad.tests.test_python_codegen.test_meta_schema_gen_up_to_date(tmp_path)`

Parameters**tmp_path** (*pathlib.Path*) –**Return type**

None

`schema_salad.tests.test_python_codegen.test_meta_schema_gen_no_base(tmp_path)`**Parameters****tmp_path** (*pathlib.Path*) –**Return type**

None

`schema_salad.tests.test_python_codegen.python_codegen(file_uri, target, parser_info=None,
package=None)`**Parameters**

- **file_uri** (*str*) –
- **target** (*pathlib.Path*) –
- **parser_info** (*Optional[str]*) –
- **package** (*Optional[str]*) –

Return type

None

`schema_salad.tests.test_python_codegen.test_default_parser_info(tmp_path)`**Parameters****tmp_path** (*pathlib.Path*) –**Return type**

None

`schema_salad.tests.test_python_codegen.test_parser_info(tmp_path)`**Parameters****tmp_path** (*pathlib.Path*) –**Return type**

None

`schema_salad.tests.test_python_codegen.test_use_of_package_for_parser_info(tmp_path)`**Parameters****tmp_path** (*pathlib.Path*) –**Return type**

None

`schema_salad.tests.test_python_codegen.test_graph_property()`Test the RDFLib Graph representation of the *\$schemas* directive.**Return type**

None

`schema_salad.tests.test_python_codegen.test_graph_property_cache()`Test that LoadingOptions properly cache the *\$schemas* RDFLib Graph representations.

Return type

None

`schema_salad.tests.test_python_codegen.test_graph_property_empty_schema()`

Test that an empty RDFLib Graph is returned when not *\$schemas* directive is present.

Return type

None

`schema_salad.tests.test_real_cwl`

Checks loading of some real world tools and workflows found in the wild (e.g. dockstore)

run individually as `py.test -k tests/test_real_cwl.py`

Module Contents

Classes

TestRealWorldCWL

Attributes

test_dir_name

`schema_salad.tests.test_real_cwl.test_dir_name = 'tests/test_real_cwl/'`

`class schema_salad.tests.test_real_cwl.TestRealWorldCWL`

`document_loader: schema_salad.ref_resolver.Loader`

`avsc_names: schema_salad.avro.schema.Names |
schema_salad.avro.schema.SchemaParseException | None`

`schema_metadata: Dict[str, Any] | None`

`metaschema_loader: schema_salad.ref_resolver.Loader | None`

`classmethod setup_class()`

Return type

None

`load_cwl(src)`

Parameters

`src (str)` –

Return type

None

test_topmed_single_doc()

TOPMed Variant Calling Pipeline CWL1

Return type

None

test_h3agatk_WES()

H3ABioNet GATK Germline Workflow

Return type

None

test_h3agatk_SNP()

H3ABioNet SNPs Workflow

Return type

None

test_icgc_pancan()

ICGC PanCan

Return type

None

`schema_salad.tests.test_ref_resolver`

Test the ref_resolver module.

Module Contents

Functions

| | |
|-------------------------------------------------------------|-----------------------------------------------------------------|
| <code>is_fs_case_sensitive(path)</code> | |
| <code>tmp_dir_fixture(request)</code> | |
| <code>test_loader_initialisation_for_HOME_env_var(</code> | |
| <code>test_loader_initialisation_for_TMP_env_var(t</code> | |
| <code>test_loader_initialisation_with_neither_TMP_</code> | |
| <code>test_loader_initialisation_disable_doc_cache</code> | |
| <code>test_DefaultFetcher_urljoin_win32(tmp_dir_fixt</code> | |
| <code>test_DefaultFetcher_urljoin_linux(tmp_dir_fixt</code> | |
| <code>test_import_list()</code> | |
| <code>test_fetch_inject_id()</code> | |
| <code>test_attachments()</code> | |
| <code>test_check_exists_follows_redirects()</code> | |
| <code>test_resolve_missing_step_id(caplog)</code> | From issue #cwltool/issues/1635. A Workflow with a Step without |

`schema_salad.tests.test_ref_resolver.is_fs_case_sensitive(path)`

Parameters

path (*str*) –

Return type

bool

`schema_salad.tests.test_ref_resolver.tmp_dir_fixture(request)`

Parameters

request (*_pytest.fixtures.FixtureRequest*) –

Return type

str

`schema_salad.tests.test_ref_resolver.test_loader_initialisation_for_HOME_env_var(tmp_dir_fixture)`

Parameters

tmp_dir_fixture (*str*) –

Return type

None

`schema_salad.tests.test_ref_resolver.test_loader_initialisation_for_TMP_env_var(tmp_dir_fixture)`

Parameters**tmp_dir_fixture** (*str*) –**Return type**

None

`schema_salad.tests.test_ref_resolver.test_loader_initialisation_with_neither_TMP_HOME_set(tmp_dir_fixture)`**Parameters****tmp_dir_fixture** (*str*) –**Return type**

None

`schema_salad.tests.test_ref_resolver.test_loader_initialisation_disable_doc_cache(tmp_dir_fixture)`**Parameters****tmp_dir_fixture** (*str*) –**Return type**

None

`schema_salad.tests.test_ref_resolver.test_DefaultFetcher_urljoin_win32(tmp_dir_fixture)`**Parameters****tmp_dir_fixture** (*str*) –**Return type**

None

`schema_salad.tests.test_ref_resolver.test_DefaultFetcher_urljoin_linux(tmp_dir_fixture)`**Parameters****tmp_dir_fixture** (*str*) –**Return type**

None

`schema_salad.tests.test_ref_resolver.test_import_list()`**Return type**

None

`schema_salad.tests.test_ref_resolver.test_fetch_inject_id()`**Return type**

None

`schema_salad.tests.test_ref_resolver.test_attachments()`**Return type**

None

`schema_salad.tests.test_ref_resolver.test_check_exists_follows_redirects()`**Return type**

None

`schema_salad.tests.test_ref_resolver.test_resolve_missing_step_id(caplog)`

From issue #cwltool/issues/1635. A Workflow with a Step without the name attribute must raise a ValidationException that contains the SourceLine data.

Parameters

caplog (*Any*) –

Return type

None

`schema_salad.tests.test_schema`

Module Contents

Functions

| |
|---------------------------------------------------------|
| <code>test_extend_and_specialize_enums(tmp_path)</code> |
|---------------------------------------------------------|

Attributes

| |
|---------------------------|
| <code>cwl_file_uri</code> |
|---------------------------|

`schema_salad.tests.test_schema.cwl_file_uri`

`schema_salad.tests.test_schema.test_extend_and_specialize_enums(tmp_path)`

Parameters

tmp_path (*pathlib.Path*) –

Return type

None

`schema_salad.tests.test_schemas_directive`

Checks for accepting \$schemas directive

run individually as `py.test -k tests/test_schemas_directive.py`

Module Contents

Classes

| |
|-----------------------------------|
| <code>TestSchemasDirective</code> |
|-----------------------------------|

| |
|-------------------------------------------------------------|
| Ensure codegen-produced parsers accept \$schemas directives |
|-------------------------------------------------------------|

Attributes

test_dir_name

```
schema_salad.tests.test_schemas_directive.test_dir_name = 'tests/'
```

```
class schema_salad.tests.test_schemas_directive.TestSchemasDirective
```

Ensure codegen-produced parsers accept \$schemas directives

document_loader: *schema_salad.ref_resolver.Loader*

avsc_names: *schema_salad.avro.schema.Names* |
schema_salad.avro.schema.SchemaParseException | *None*

schema_metadata: Dict[str, Any] | *None*

metaschema_loader: *schema_salad.ref_resolver.Loader* | *None*

classmethod setup_class()

Return type

None

load_cwl(src)

Parameters

src (*str*) –

Return type

Tuple[Any, Dict[str, Any]]

test_dollarsign_schema()

EDAM.owl as a schema

Return type

None

schema_salad.tests.test_subtypes

Confirm subtypes.

Module Contents

Functions

| | |
|----------------------------------------------|--------------------------------------------------------------------|
| <code>test_subtypes(old, new, result)</code> | Test <code>is_subtype()</code> function. |
| <code>test_avro_loading_subtype()</code> | Confirm conversion of SALAD style names to avro when overriding. |
| <code>test_avro_loading_subtype_bad()</code> | Confirm subtype error when overriding incorrectly. |
| <code>test_subtypes_nested()</code> | Confirm correct subtype handling on a nested type definition. |
| <code>test_subtypes_nested_bad()</code> | Confirm subtype error when overriding incorrectly in nested types. |
| <code>test_subtypes_recursive()</code> | Confirm correct subtype handling on a recursive type definition. |
| <code>test_subtypes_union()</code> | Confirm correct subtype handling on an union type definition. |
| <code>test_subtypes_union_bad()</code> | Confirm subtype error when overriding incorrectly in array types. |

Attributes

| |
|--------------------|
| <code>types</code> |
|--------------------|

```
schema_salad.tests.test_subtypes.types = ([('int', 'float', 'double'], 'int', True),
[('int', 'float', 'double'], ['int'], True),...
```

```
schema_salad.tests.test_subtypes.test_subtypes(old, new, result)
```

Test `is_subtype()` function.

Parameters

- **old** (`schema_salad.avro.schema.PropType`) –
- **new** (`schema_salad.avro.schema.PropType`) –
- **result** (`bool`) –

Return type

None

```
schema_salad.tests.test_subtypes.test_avro_loading_subtype()
```

Confirm conversion of SALAD style names to avro when overriding.

Return type

None

```
schema_salad.tests.test_subtypes.test_avro_loading_subtype_bad()
```

Confirm subtype error when overriding incorrectly.

Return type

None

```
schema_salad.tests.test_subtypes.test_subtypes_nested()
```

Confirm correct subtype handling on a nested type definition.

Return type

None

`schema_salad.tests.test_subtypes.test_subtypes_nested_bad()`

Confirm subtype error when overriding incorrectly in nested types.

Return type

None

`schema_salad.tests.test_subtypes.test_subtypes_recursive()`

Confirm correct subtype handling on a recursive type definition.

Return type

None

`schema_salad.tests.test_subtypes.test_subtypes_union()`

Confirm correct subtype handling on an union type definition.

Return type

None

`schema_salad.tests.test_subtypes.test_subtypes_union_bad()`

Confirm subtype error when overriding incorrectly in array types.

Return type

None

`schema_salad.tests.test_typescript_codegen`**Module Contents****Functions**`test_cwl_gen(tmp_path)``test_meta_schema_gen(tmp_path)``test_class_field(tmp_path)``get_data_uri(resource_path)``typescript_codegen(file_uri, target[, examples])`

Attributes

| |
|----------------------------------|
| <code>cwl_file_uri</code> |
| <code>metaschema_file_uri</code> |

`schema_salad.tests.test_typescript_codegen.test_cwl_gen(tmp_path)`

Parameters

tmp_path (`pathlib.Path`) –

Return type

None

`schema_salad.tests.test_typescript_codegen.test_meta_schema_gen(tmp_path)`

Parameters

tmp_path (`pathlib.Path`) –

Return type

None

`schema_salad.tests.test_typescript_codegen.test_class_field(tmp_path)`

Parameters

tmp_path (`pathlib.Path`) –

Return type

None

`schema_salad.tests.test_typescript_codegen.get_data_uri(resource_path)`

Parameters

resource_path (`str`) –

Return type

`str`

`schema_salad.tests.test_typescript_codegen.cwl_file_uri`

`schema_salad.tests.test_typescript_codegen.metaschema_file_uri`

`schema_salad.tests.test_typescript_codegen.typescript_codegen(file_uri, target, examples=None)`

Parameters

- **file_uri** (`str`) –
- **target** (`pathlib.Path`) –
- **examples** (`Optional[pathlib.Path]`) –

Return type

None

schema_salad.tests.util

Shared test functions and attributes.

Module Contents**Functions**

| | |
|------------------------------------------|-------------------------------------------------|
| <code>get_data(filename)</code> | Get the file path for a given schema file name. |
| <code>get_data_uri(resource_path)</code> | Get the file URI for tests. |

Attributes

| |
|----------------------------------|
| <code>cwl_file_uri</code> |
| <code>metaschema_file_uri</code> |
| <code>basket_file_uri</code> |

`schema_salad.tests.util.get_data(filename)`

Get the file path for a given schema file name.

It is able to find file names in the `schema_salad` namespace, but also able to load schema files from the `tests` directory.

Parameters

filename (*str*) –

Return type

Optional[*str*]

`schema_salad.tests.util.get_data_uri(resource_path)`

Get the file URI for tests.

Parameters

resource_path (*str*) –

Return type

str

`schema_salad.tests.util.cwl_file_uri`

`schema_salad.tests.util.metaschema_file_uri`

`schema_salad.tests.util.basket_file_uri`

Submodules

`schema_salad.__main__`

Default entry point for the schema-salad module.

`schema_salad.codegen`

Generate language specific loaders for a particular SALAD schema.

Module Contents

Functions

| | |
|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| <code>codegen</code> (<i>lang</i> , <i>i</i> , <i>schema_metadata</i> , <i>loader</i> [, <i>target</i> , ...]) | Generate classes with loaders for the given Schema Salad description. |
|-----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|

Attributes

| |
|-------------------------------|
| <code>FIELD_SORT_ORDER</code> |
|-------------------------------|

`schema_salad.codegen.FIELD_SORT_ORDER = ['id', 'class', 'name']`

`schema_salad.codegen.codegen`(*lang*, *i*, *schema_metadata*, *loader*, *target*=None, *examples*=None, *package*=None, *copyright*=None, *spdx_copyright_text*=None, *spdx_license_identifier*=None, *parser_info*=None)

Generate classes with loaders for the given Schema Salad description.

Parameters

- **lang** (*str*) –
- **i** (*List*[*Dict*[*str*, *str*]]) –
- **schema_metadata** (*Dict*[*str*, *Any*]) –
- **loader** (`schema_salad.ref_resolver.Loader`) –
- **target** (*Optional*[*str*]) –
- **examples** (*Optional*[*str*]) –
- **package** (*Optional*[*str*]) –
- **copyright** (*Optional*[*str*]) –
- **spdx_copyright_text** (*Optional*[*List*[*str*]]) –
- **spdx_license_identifier** (*Optional*[*str*]) –
- **parser_info** (*Optional*[*str*]) –

Return type

None

schema_salad.codegen_base

Base class for the generation of loaders from schema-salad definitions.

Module Contents**Classes**

| | |
|--------------------|-------------------------------------------------------|
| <i>TypeDef</i> | Schema Salad type description. |
| <i>LazyInitDef</i> | Lazy initialization logic. |
| <i>CodeGenBase</i> | Abstract base class for schema salad code generators. |

```
class schema_salad.codegen_base.TypeDef(name, init, is_uri=False, scoped_id=False, ref_scope=0,
                                         loader_type=None, instance_type=None, abstract=False)
```

Schema Salad type description.

Parameters

- **name** (*str*) –
- **init** (*str*) –
- **is_uri** (*bool*) –
- **scoped_id** (*bool*) –
- **ref_scope** (*Optional[int]*) –
- **loader_type** (*Optional[str]*) –
- **instance_type** (*Optional[str]*) –
- **abstract** (*bool*) –

```
__slots__ = ['name', 'init', 'is_uri', 'scoped_id', 'ref_scope', 'loader_type',
             'instance_type', 'abstract']
```

```
class schema_salad.codegen_base.LazyInitDef(name, init)
```

Lazy initialization logic.

Parameters

- **name** (*str*) –
- **init** (*str*) –

```
__slots__ = ('name', 'init')
```

```
class schema_salad.codegen_base.CodeGenBase
```

Abstract base class for schema salad code generators.

declare_type(*declared_type*)

Add this type to our collection, if needed.

Parameters

declared_type (*TypeDef*) –

Return type

TypeDef

add_lazy_init(*lazy_init*)

Add lazy initialization logic for a given type.

Parameters

lazy_init (*LazyInitDef*) –

Return type

None

add_vocab(*name*, *uri*)

Add the given name as an abbreviation for the given URI.

Parameters

- **name** (*str*) –

- **uri** (*str*) –

Return type

None

abstract prologue()

Trigger to generate the prologue code.

Return type

None

abstract static safe_name(*name*)

Generate a safe version of the given name.

Parameters

name (*str*) –

Return type

str

abstract begin_class(*classname*, *extends*, *doc*, *abstract*, *field_names*, *idfield*, *optional_fields*)

Produce the header for the given class.

Parameters

- **classname** (*str*) –

- **extends** (*MutableSequence[str]*) –

- **doc** (*str*) –

- **abstract** (*bool*) –

- **field_names** (*MutableSequence[str]*) –

- **idfield** (*str*) –

- **optional_fields** (*Set[str]*) –

Return type

None

abstract end_class(*classname*, *field_names*)

Signal that we are done with this class.

Parameters

- **classname** (*str*) –
- **field_names** (*List[str]*) –

Return type

None

abstract type_loader(*type_declaration*, *container=None*, *no_link_check=None*)

Parse the given type declaration and declare its components.

Parameters

- **type_declaration** (*Union[List[Any], Dict[str, Any]]*) –
- **container** (*Optional[str]*) –
- **no_link_check** (*Optional[bool]*) –

Return type*TypeDef***abstract declare_field**(*name*, *fieldtype*, *doc*, *optional*, *subscope*)

Output the code to load the given field.

Parameters

- **name** (*str*) –
- **fieldtype** (*TypeDef*) –
- **doc** (*Optional[str]*) –
- **optional** (*bool*) –
- **subscope** (*Optional[str]*) –

Return type

None

abstract declare_id_field(*name*, *fieldtype*, *doc*, *optional*)

Output the code to handle the given ID field.

Parameters

- **name** (*str*) –
- **fieldtype** (*TypeDef*) –
- **doc** (*Optional[str]*) –
- **optional** (*bool*) –

Return type

None

abstract uri_loader(*inner*, *scoped_id*, *vocab_term*, *ref_scope*, *no_link_check=None*)

Construct the TypeDef for the given URI loader.

Parameters

- **inner** (*TypeDef*) –
- **scoped_id** (*bool*) –
- **vocab_term** (*bool*) –
- **ref_scope** (*Optional[int]*) –
- **no_link_check** (*Optional[bool]*) –

Return type

TypeDef

abstract idmap_loader(*field, inner, map_subject, map_predicate*)

Construct the TypeDef for the given mapped ID loader.

Parameters

- **field** (*str*) –
- **inner** (*TypeDef*) –
- **map_subject** (*str*) –
- **map_predicate** (*Optional[str]*) –

Return type

TypeDef

abstract typedsl_loader(*inner, ref_scope*)

Construct the TypeDef for the given DSL loader.

Parameters

- **inner** (*TypeDef*) –
- **ref_scope** (*Optional[int]*) –

Return type

TypeDef

abstract epilogue(*root_loader*)

Trigger to generate the epilogue code.

Parameters

root_loader (*TypeDef*) –

Return type

None

abstract secondaryfilesdsl_loader(*inner*)

Construct the TypeDef for secondary files.

Parameters

inner (*TypeDef*) –

Return type

TypeDef

schema_salad.cpp_codegen

C++17 code generator for a given Schema Salad definition.

Currently only supports emitting YAML from the C++ objects, not yet parsing YAML into C++ objects.

The generated code requires the libyaml-cpp library & headers

To see an example of usage, look at schema_salad/tests/codegen/cwl.cpp which can be combined with the CWL V1.0 schema as shown below:

```

schema-salad-tool --codegen cpp          schema_salad/tests/test_schema/
↪ CommonWorkflowLanguage.yml           > cwl_v1_0.h

g++ --std=c++20 -I. -lyaml-cpp schema_salad/tests/codegen/cwl.cpp -o cwl-v1_0-test
./cwl-v1_0-test

# g++ versions older than version 10 may need "--std=c++2a" instead of "--std=c++20"

```

Module Contents

Classes

| | |
|------------------------|-------------------------------------------------------------|
| <i>ClassDefinition</i> | Prototype of a class. |
| <i>FieldDefinition</i> | Prototype of a single field from a class definition. |
| <i>MapDefinition</i> | Prototype of a map. |
| <i>UnionDefinition</i> | Prototype of a union. |
| <i>EnumDefinition</i> | Prototype of an enum. |
| <i>CppCodeGen</i> | Generation of C++ code for a given Schema Salad definition. |

Functions

| | |
|-------------------------------|-------------------------------------------|
| <i>q(s)</i> | Put quotes around a string. |
| <i>replaceKeywords(s)</i> | Rename keywords that are reserved in C++. |
| <i>safename(name)</i> | Create a C++ safe name. |
| <i>safename2(name)</i> | Create a namespaced safename. |
| <i>split_name(s)</i> | Split url name into its components. |
| <i>split_field(s)</i> | Split field into its components. |
| <i>isPrimitiveType(v)</i> | Check if v is a primitive type. |
| <i>hasFieldValue(e, f, v)</i> | Check if e has a field f value. |
| <i>isRecordSchema(v)</i> | Check if v is of type record schema. |
| <i>isEnumSchema(v)</i> | Check if v is of type enum schema. |
| <i>isArray(v)</i> | Check if v is of type array. |
| <i>pred(i)</i> | Check if v is any of the simple types. |
| <i>isArraySchema(v)</i> | Check if v is of type array schema. |
| <i>isMapSchema(v)</i> | Check if v is of type map schema. |
| <i>isUnionSchema(v)</i> | Check if v is of type union schema. |

`schema_salad.cpp_codegen.q(s)`

Put quotes around a string.

Parameters

s (*str*) –

Return type

str

`schema_salad.cpp_codegen.replaceKeywords(s)`

Rename keywords that are reserved in C++.

Parameters

s (*str*) –

Return type

str

`schema_salad.cpp_codegen.safename(name)`

Create a C++ safe name.

Parameters

name (*str*) –

Return type

str

`schema_salad.cpp_codegen.safename2(name)`

Create a namespaced safename.

Parameters

name (*Dict*[*str*, *str*]) –

Return type

str

`schema_salad.cpp_codegen.split_name(s)`

Split url name into its components.

Splits names like <https://xyz.xyz/blub#cwl/class> into its class path and non class path

Parameters

s (*str*) –

Return type

Tuple[*str*, *str*]

`schema_salad.cpp_codegen.split_field(s)`

Split field into its components.

similar to `split_name` but for field names

Parameters

s (*str*) –

Return type

Tuple[*str*, *str*, *str*]

`class schema_salad.cpp_codegen.ClassDefinition(name)`

Prototype of a class.

Parameters

name (*str*) –

writeFwdDeclaration(*target*, *fullInd*, *ind*)

Write forward declaration.

Parameters

- **target** (*IO*[*str*]) –
- **fullInd** (*str*) –
- **ind** (*str*) –

Return type

None

writeDefinition(*target*, *fullInd*, *ind*)

Write definition of the class.

Parameters

- **target** (*IO*[*Any*]) –
- **fullInd** (*str*) –
- **ind** (*str*) –

Return type

None

writeImplDefinition(*target*, *fullInd*, *ind*)

Write definition with implementation.

Parameters

- **target** (*IO*[*str*]) –
- **fullInd** (*str*) –
- **ind** (*str*) –

Return type

None

class `schema_salad.cpp_codegen.FieldDefinition`(*name*, *typeStr*, *optional*, *remap*)

Prototype of a single field from a class definition.

Parameters

- **name** (*str*) –
- **typeStr** (*str*) –
- **optional** (*bool*) –
- **remap** (*str*) –

writeDefinition(*target*, *fullInd*, *ind*, *namespace*)

Write a C++ definition for the class field.

Parameters

- **target** (*IO*[*Any*]) –
- **fullInd** (*str*) –
- **ind** (*str*) –
- **namespace** (*str*) –

Return type

None

class schema_salad.cpp_codegen.**MapDefinition**(*name*, *values*)

Prototype of a map.

Parameters

- **name** (*str*) –
- **values** (*List[str]*) –

writeFwdDeclaration(*target*, *fullInd*, *ind*)

Write forward declaration.

Parameters

- **target** (*IO[str]*) –
- **fullInd** (*str*) –
- **ind** (*str*) –

Return type

None

writeDefinition(*target*, *ind*)

Write map definition to output.

Parameters

- **target** (*IO[str]*) –
- **ind** (*str*) –

Return type

None

writeImplDefinition(*target*, *fullInd*, *ind*)

Write definition with implementation.

Parameters

- **target** (*IO[str]*) –
- **fullInd** (*str*) –
- **ind** (*str*) –

Return type

None

class schema_salad.cpp_codegen.**UnionDefinition**(*name*, *types*)

Prototype of a union.

Parameters

- **name** (*str*) –
- **types** (*List[str]*) –

writeFwdDeclaration(*target*, *fullInd*, *ind*)

Write forward declaration.

Parameters

- **target** (*IO[str]*) –

- **fullInd** (*str*) –

- **ind** (*str*) –

Return type

None

writeDefinition(*target*, *ind*)

Write union definition to output.

Parameters

- **target** (*IO*[*str*]) –

- **ind** (*str*) –

Return type

None

writeImplDefinition(*target*, *fullInd*, *ind*)

Write definition with implementation.

Parameters

- **target** (*IO*[*str*]) –

- **fullInd** (*str*) –

- **ind** (*str*) –

Return type

None

class `schema_salad.cpp_codegen.EnumDefinition`(*name*, *values*)

Prototype of a enum.

Parameters

- **name** (*str*) –

- **values** (*List*[*str*]) –

writeDefinition(*target*, *ind*)

Write enum definition to output.

Parameters

- **target** (*IO*[*str*]) –

- **ind** (*str*) –

Return type

None

`schema_salad.cpp_codegen.isPrimitiveType`(*v*)

Check if *v* is a primitive type.

Parameters

v (*Any*) –

Return type

bool

`schema_salad.cpp_codegen.hasFieldValue(e, f, v)`

Check if *e* has a field *f* value.

Parameters

- ***e*** (*Any*) –
- ***f*** (*str*) –
- ***v*** (*Any*) –

Return type

bool

`schema_salad.cpp_codegen.isRecordSchema(v)`

Check if *v* is of type record schema.

Parameters

v (*Any*) –

Return type

bool

`schema_salad.cpp_codegen.isEnumSchema(v)`

Check if *v* is of type enum schema.

Parameters

v (*Any*) –

Return type

bool

`schema_salad.cpp_codegen.isArray(v)`

Check if *v* is of type array.

Parameters

v (*Any*) –

Return type

bool

`schema_salad.cpp_codegen.pred(i)`

Check if *v* is any of the simple types.

Parameters

i (*Any*) –

Return type

bool

`schema_salad.cpp_codegen.isArraySchema(v)`

Check if *v* is of type array schema.

Parameters

v (*Any*) –

Return type

bool

`schema_salad.cpp_codegen.isMapSchema(v)`

Check if *v* is of type map schema.

Parameters**v** (*Any*) –**Return type***bool*`schema_salad.cpp_codegen.isUnionSchema(v)`

Check if v is of type union schema.

Parameters**v** (*Any*) –**Return type***bool*

class `schema_salad.cpp_codegen.CppCodeGen`(*base*, *target*, *examples*, *package*, *copyright*,
spdx_copyright_text, *spdx_license_identifier*)

Bases: *schema_salad.codegen_base.CodeGenBase*

Generation of C++ code for a given Schema Salad definition.

Parameters

- **base** (*str*) –
- **target** (*IO[str]*) –
- **examples** (*Optional[str]*) –
- **package** (*str*) –
- **copyright** (*Optional[str]*) –
- **spdx_copyright_text** (*Optional[List[str]]*) –
- **spdx_license_identifier** (*Optional[str]*) –

convertTypeToCpp(*type_declaration*)

Convert a Schema Salad type to a C++ type.

Parameters**type_declaration** (*Union[List[Any], Dict[str, Any], str]*) –**Return type***str***epilogue**(*root_loader*)

Generate final part of our cpp file.

Parameters**root_loader** (*Optional[schema_salad.codegen_base.TypeDef]*) –**Return type***None***parseRecordField**(*field*)

Parse a record field.

Parameters**field** (*Dict[str, Any]*) –**Return type***FieldDefinition*

parseRecordSchema(*stype*)

Parse a record schema.

Parameters

stype (*Dict*[*str*, *Any*]) –

Return type

None

parseMapSchema(*stype*)

Parse a map schema.

Parameters

stype (*Dict*[*str*, *Any*]) –

Return type

str

parseUnionSchema(*stype*)

Parse a union schema.

Parameters

stype (*Dict*[*str*, *Any*]) –

Return type

str

parseEnum(*stype*)

Parse a schema salad enum.

Parameters

stype (*Dict*[*str*, *Any*]) –

Return type

str

parse(*items*)

Parse sechema salad items.

This function is being called from the outside and drives the whole code generation.

Parameters

items (*List*[*Dict*[*str*, *Any*]]) –

Return type

None

schema_salad.dlang_codegen

D code generator for a given schema salad definition.

Module Contents

Classes

| | |
|---------------------|-----------------------------------------------------------|
| <i>DlangCodeGen</i> | Generation of D code for a given Schema Salad definition. |
|---------------------|-----------------------------------------------------------|

class `schema_salad.dlang_codegen.DlangCodeGen`(*base*, *target*, *examples*, *package*, *copyright_*, *parser_info*, *salad_version*)

Bases: `schema_salad.codegen_base.CodeGenBase`

Generation of D code for a given Schema Salad definition.

Parameters

- **base** (*str*) –
- **target** (*IO[str]*) –
- **examples** (*Optional[str]*) –
- **package** (*str*) –
- **copyright_** (*Optional[str]*) –
- **parser_info** (*Optional[str]*) –
- **salad_version** (*str*) –

prologue()

Trigger to generate the prologue code.

Return type

None

epilogue(*root_loader*)

Trigger to generate the epilouge code.

Parameters

root_loader (`schema_salad.codegen_base.TypeDef`) –

Return type

None

static safe_name(*name*)

Generate a safe version of the given name.

Parameters

name (*str*) –

Return type

str

to_doc_comment(*doc*)

Return an embedded documentation comments for a given string.

Parameters

doc (`Union[None, str, List[str]]`) –

Return type`str`**parse_record_field_type**(*type_*, *jsonld_pred*)

Return an annotation string and a type string.

Parameters

- **type_** (*Any*) –
- **jsonld_pred** (*Union[None, str, Dict[str, Any]]*) –

Return type`Tuple[str, str]`**parse_record_field**(*field*, *parent_name=None*)

Return a declaration string for a given record field.

Parameters

- **field** (*Dict[str, Any]*) –
- **parent_name** (*Optional[str]*) –

Return type`str`**parse_record_schema**(*stype*)

Return a declaration string for a given record schema.

Parameters**stype** (*Dict[str, Any]*) –**Return type**`str`**parse_enum**(*stype*)

Return a declaration string for a given enum schema.

Parameters**stype** (*Dict[str, Any]*) –**Return type**`str`**parse**(*items*)

Generate D code from items and write it to target.

Parameters**items** (*List[Dict[str, Any]]*) –**Return type**`None`

schema_salad.dotnet_codegen

DotNet code generator for a given schema salad definition.

Module Contents

Classes

| | |
|----------------------|--------------------------------------------------------------------|
| <i>DotNetCodeGen</i> | Generation of TypeScript code for a given Schema Salad definition. |
|----------------------|--------------------------------------------------------------------|

Functions

| | |
|------------------------------------------------|----------------------------------------------------------------|
| <i>doc_to_doc_string</i> (doc[, indent_level]) | Generate a documentation string from a schema salad doc field. |
|------------------------------------------------|----------------------------------------------------------------|

Attributes

| | |
|--------------|--|
| <i>prims</i> | |
|--------------|--|

schema_salad.dotnet_codegen.**doc_to_doc_string**(doc, indent_level=0)

Generate a documentation string from a schema salad doc field.

Parameters

- **doc** (*Optional*[*str*]) –
- **indent_level** (*int*) –

Return type

str

schema_salad.dotnet_codegen.**prims**

class schema_salad.dotnet_codegen.**DotNetCodeGen**(base, examples, target, package)

Bases: *schema_salad.codegen_base.CodeGenBase*

Generation of TypeScript code for a given Schema Salad definition.

Parameters

- **base** (*str*) –
- **examples** (*Optional*[*str*]) –
- **target** (*Optional*[*str*]) –
- **package** (*str*) –

prologue()

Trigger to generate the prologue code.

Return type

None

static safe_name(name)

Generate a safe version of the given name.

Parameters

name (*str*) –

Return type

str

begin_class(classname, extends, doc, abstract, field_names, idfield, optional_fields)

Produce the header for the given class.

Parameters

- **classname** (*str*) –
- **extends** (*MutableSequence[str]*) –
- **doc** (*str*) –
- **abstract** (*bool*) –
- **field_names** (*MutableSequence[str]*) –
- **idfield** (*str*) –
- **optional_fields** (*Set[str]*) –

Return type

None

end_class(classname, field_names)

Signal that we are done with this class.

Parameters

- **classname** (*str*) –
- **field_names** (*List[str]*) –

Return type

None

type_loader(type_declaration, container=None, no_link_check=None)

Parse the given type declaration and declare its components.

Parameters

- **type_declaration** (*Union[List[Any], Dict[str, Any], str]*) –
- **container** (*Optional[str]*) –
- **no_link_check** (*Optional[bool]*) –

Return type

schema_salad.codegen_base.TypeDef

type_loader_enum(*type_declaration*)

Parameters

type_declaration (*Dict*[*str*, *Any*]) –

Return type

schema_salad.codegen_base.TypeDef

declare_field(*name*, *fieldtype*, *doc*, *optional*, *subscope*)

Output the code to load the given field.

Parameters

- **name** (*str*) –
- **fieldtype** (*schema_salad.codegen_base.TypeDef*) –
- **doc** (*Optional*[*str*]) –
- **optional** (*bool*) –
- **subscope** (*Optional*[*str*]) –

Return type

None

declare_id_field(*name*, *fieldtype*, *doc*, *optional*)

Output the code to handle the given ID field.

Parameters

- **name** (*str*) –
- **fieldtype** (*schema_salad.codegen_base.TypeDef*) –
- **doc** (*Optional*[*str*]) –
- **optional** (*bool*) –

Return type

None

to_dotnet(*val*)

Convert a Python keyword to a DotNet keyword.

Parameters

val (*Any*) –

Return type

Any

uri_loader(*inner*, *scoped_id*, *vocab_term*, *ref_scope*, *no_link_check=None*)

Construct the TypeDef for the given URI loader.

Parameters

- **inner** (*schema_salad.codegen_base.TypeDef*) –
- **scoped_id** (*bool*) –
- **vocab_term** (*bool*) –
- **ref_scope** (*Optional*[*int*]) –
- **no_link_check** (*Optional*[*bool*]) –

Return type

schema_salad.codegen_base.TypeDef

idmap_loader(*field*, *inner*, *map_subject*, *map_predicate*)

Construct the TypeDef for the given mapped ID loader.

Parameters

- **field** (*str*) –
- **inner** (*schema_salad.codegen_base.TypeDef*) –
- **map_subject** (*str*) –
- **map_predicate** (*Optional[str]*) –

Return type

schema_salad.codegen_base.TypeDef

typedsl_loader(*inner*, *ref_scope*)

Construct the TypeDef for the given DSL loader.

Parameters

- **inner** (*schema_salad.codegen_base.TypeDef*) –
- **ref_scope** (*Optional[int]*) –

Return type

schema_salad.codegen_base.TypeDef

epilogue(*root_loader*)

Trigger to generate the epilogue code.

Parameters

root_loader (*schema_salad.codegen_base.TypeDef*) –

Return type

None

secondaryfilesdsl_loader(*inner*)

Construct the TypeDef for secondary files.

Parameters

inner (*schema_salad.codegen_base.TypeDef*) –

Return type

schema_salad.codegen_base.TypeDef

schema_salad.exceptions

Shared Exception classes.

Module Contents

Functions

`to_one_line_messages(exc)`

exception `schema_salad.exceptions.SchemaSaladException(msg, sl=None, children=None, bullet_for_children="")`

Bases: `Exception`

Base class for all schema-salad exceptions.

Parameters

- **msg** (*str*) –
- **sl** (*Optional[schema_salad.sourceline.SourceLine]*) –
- **children** (*Optional[Sequence[SchemaSaladException]]*) –
- **bullet_for_children** (*str*) –

propagate_sourceline()

Return type

`None`

as_warning()

Return type

SchemaSaladException

with_sourceline(sl)

Parameters

- sl** (*Optional[schema_salad.sourceline.SourceLine]*) –

Return type

SchemaSaladException

leaves()

Return type

`List[SchemaSaladException]`

prefix()

Return type

`str`

summary(level=0, with_bullet=False)

Parameters

- **level** (*int*) –
- **with_bullet** (*bool*) –

Return type`str``__str__()`

Convert to a string using `pretty_str()`.

Return type`str``pretty_str(level=0)`**Parameters**`level (int) –`**Return type**`str`

exception `schema_salad.exceptions.SchemaException(msg, sl=None, children=None, bullet_for_children="")`

Bases: `SchemaSaladException`

Indicates error with the provided schema definition.

Parameters

- `msg (str) –`
- `sl (Optional[schema_salad.sourceline.SourceLine]) –`
- `children (Optional[Sequence[SchemaSaladException]]) –`
- `bullet_for_children (str) –`

exception `schema_salad.exceptions.ValidationException(msg, sl=None, children=None, bullet_for_children="")`

Bases: `SchemaSaladException`

Indicates error with document against the provided schema.

Parameters

- `msg (str) –`
- `sl (Optional[schema_salad.sourceline.SourceLine]) –`
- `children (Optional[Sequence[SchemaSaladException]]) –`
- `bullet_for_children (str) –`

exception `schema_salad.exceptions.ClassValidationException(msg, sl=None, children=None, bullet_for_children="")`

Bases: `ValidationException`

Indicates error with document against the provided schema.

Parameters

- `msg (str) –`
- `sl (Optional[schema_salad.sourceline.SourceLine]) –`

- **children** (*Optional*[*Sequence*[*SchemaSaladException*]]) –
- **bullet_for_children** (*str*) –

`schema_salad.exceptions.to_one_line_messages(exc)`

Parameters

exc (*SchemaSaladException*) –

Return type

str

`schema_salad.fetcher`

Resource fetching.

Module Contents

Classes

| | |
|-----------------------------|----------------------------------------------------------|
| <i>Fetcher</i> | Fetch resources from URIs. |
| <i>MemoryCachingFetcher</i> | Fetcher that caches resources in memory after retrieval. |
| <i>DefaultFetcher</i> | The default Fetcher implementation. |

class `schema_salad.fetcher.Fetcher`

Bases: `abc.ABC`

Fetch resources from URIs.

schemes = ['file', 'http', 'https', 'mailto']

abstract **fetch_text**(*url*, *content_types=None*)

Retrieve the given resource as a string.

Parameters

- **url** (*str*) –
- **content_types** (*Optional*[*List*[*str*]]) –

Return type

str

abstract **check_exists**(*url*)

Check if the given resource exists.

Parameters

url (*str*) –

Return type

bool

abstract urljoin(*base_url*, *url*)

Construct a full (“absolute”) URL by combining a “base URL” with another URL.

Parameters

- **base_url** (*str*) –
- **url** (*str*) –

Return type

str

supported_schemes()

Return the list of supported URI schemes.

Return type

List[*str*]

class `schema_salad.fetcher.MemoryCachingFetcher`(*cache*)

Bases: *Fetcher*

Fetcher that caches resources in memory after retrieval.

Parameters

cache (`schema_salad.utils.CacheType`) –

class `schema_salad.fetcher.DefaultFetcher`(*cache*, *session*)

Bases: *MemoryCachingFetcher*

The default Fetcher implementation.

Parameters

- **cache** (`schema_salad.utils.CacheType`) –
- **session** (*Optional*[*requests.sessions.Session*]) –

fetch_text(*url*, *content_types=None*)

Retrieve the given resource as a string.

Parameters

- **url** (*str*) –
- **content_types** (*Optional*[List[*str*]]) –

Return type

str

check_exists(*url*)

Check if the given resource exists.

Parameters

url (*str*) –

Return type

bool

urljoin(*base_url*, *url*)

Construct a full (“absolute”) URL by combining a “base URL” with another URL.

Parameters

- **base_url** (*str*) –
- **url** (*str*) –

Return type

str

schema_salad.java_codegen

Java code generator for a given schema salad definition.

Module Contents

Classes

JavaCodeGen

Abstract base class for schema salad code generators.

Functions

doc_to_doc_string(*doc*[, *indent_level*])

Attributes

USE_ONE_OR_LIST_OF_TYPES

BASIC_JAVA_IDENTIFIER_RE

prims

schema_salad.java_codegen.USE_ONE_OR_LIST_OF_TYPES = False

schema_salad.java_codegen.BASIC_JAVA_IDENTIFIER_RE

schema_salad.java_codegen.doc_to_doc_string(*doc*, *indent_level*=0)

Parameters

- **doc** (*Optional[str]*) –
- **indent_level** (*int*) –

Return type

`str`

`schema_salad.java_codegen.prim`s

class `schema_salad.java_codegen.JavaCodeGen`(*base, target, examples, package, copyright*)

Bases: `schema_salad.codegen_base.CodeGenBase`

Abstract base class for schema salad code generators.

Parameters

- **base** (`str`) –
- **target** (`Optional[str]`) –
- **examples** (`Optional[str]`) –
- **package** (`str`) –
- **copyright** (`Optional[str]`) –

prologue()

Trigger to generate the prologue code.

Return type

`None`

static `property_name`(*name*)

Parameters

- **name** (`str`) –

Return type

`str`

static `safe_name`(*name*)

Generate a safe version of the given name.

Parameters

- **name** (`str`) –

Return type

`str`

interface_name(*n*)

Parameters

- **n** (`str`) –

Return type

`str`

begin_class(*classname, extends, doc, abstract, field_names, idfield, optional_fields*)

Produce the header for the given class.

Parameters

- **classname** (`str`) –
- **extends** (`MutableSequence[str]`) –
- **doc** (`str`) –

- **abstract** (*bool*) –
- **field_names** (*MutableSequence[str]*) –
- **idfield** (*str*) –
- **optional_fields** (*Set[str]*) –

Return type

None

end_class(*classname, field_names*)

Finish this class.

Parameters

- **classname** (*str*) –
- **field_names** (*List[str]*) –

Return type

None

type_loader(*type_declaration, container=None, no_link_check=None*)

Parse the given type declaration and declare its components.

Parameters

- **type_declaration** (*Union[List[Any], Dict[str, Any], str]*) –
- **container** (*Optional[str]*) –
- **no_link_check** (*Optional[bool]*) –

Return type*schema_salad.codegen_base.TypeDef***type_loader_enum**(*type_declaration*)**Parameters****type_declaration** (*Dict[str, Any]*) –**Return type***schema_salad.codegen_base.TypeDef***declare_field**(*name, fieldtype, doc, optional, subscope*)

Output the code to load the given field.

Parameters

- **name** (*str*) –
- **fieldtype** (*schema_salad.codegen_base.TypeDef*) –
- **doc** (*Optional[str]*) –
- **optional** (*bool*) –
- **subscope** (*Optional[str]*) –

Return type

None

declare_id_field(*name, fieldtype, doc, optional*)

Output the code to handle the given ID field.

Parameters

- **name** (*str*) –
- **fieldtype** (*schema_salad.codegen_base.TypeDef*) –
- **doc** (*Optional[str]*) –
- **optional** (*bool*) –

Return type

None

uri_loader(*inner, scoped_id, vocab_term, ref_scope, no_link_check=None*)

Construct the TypeDef for the given URI loader.

Parameters

- **inner** (*schema_salad.codegen_base.TypeDef*) –
- **scoped_id** (*bool*) –
- **vocab_term** (*bool*) –
- **ref_scope** (*Optional[int]*) –
- **no_link_check** (*Optional[bool]*) –

Return type

schema_salad.codegen_base.TypeDef

idmap_loader(*field, inner, map_subject, map_predicate*)

Construct the TypeDef for the given mapped ID loader.

Parameters

- **field** (*str*) –
- **inner** (*schema_salad.codegen_base.TypeDef*) –
- **map_subject** (*str*) –
- **map_predicate** (*Optional[str]*) –

Return type

schema_salad.codegen_base.TypeDef

typedsl_loader(*inner, ref_scope*)

Construct the TypeDef for the given DSL loader.

Parameters

- **inner** (*schema_salad.codegen_base.TypeDef*) –
- **ref_scope** (*Union[int, None]*) –

Return type

schema_salad.codegen_base.TypeDef

to_java(*val*)

Parameters

val (*Any*) –

Return type

Any

epilogue(*root_loader*)

Trigger to generate the epilouge code.

Parameters

root_loader (*schema_salad.codegen_base.TypeDef*) –

Return type

None

secondaryfilesdsl_loader(*inner*)

Construct the TypeDef for secondary files.

Parameters

inner (*schema_salad.codegen_base.TypeDef*) –

Return type

schema_salad.codegen_base.TypeDef

`schema_salad.jsonld_context`

Module Contents**Functions**

pred(datatype, field, name, context, defaultBase, ...)

process_type(t, g, context, defaultBase, namespaces, ...)

salad_to_jsonld_context(j, schema_ctx)

fix_jsonld_ids(obj, ids)

Add missing identity entries.

makerdf(workflow, wf, ctx[, graph])

`schema_salad.jsonld_context.pred`(*datatype, field, name, context, defaultBase, namespaces*)

Parameters

- **datatype** (*MutableMapping*[*str*, *Union*[*Dict*[*str*, *str*], *str*]]) –
- **field** (*Optional*[*Dict*[*str*, *Any*]]) –
- **name** (*str*) –
- **context** (*schema_salad.utils.ContextType*) –
- **defaultBase** (*str*) –
- **namespaces** (*Dict*[*str*, *rdflib.namespace.Namespace*]) –

Return type

Union[*Dict*[*str*, *Optional*[*str*]], *str*]

`schema_salad.jsonld_context.process_type`(*t, g, context, defaultBase, namespaces, defaultPrefix*)

Parameters

- **t** (*MutableMapping*[*str*, *Any*]) –

- **g** (*rdflib.Graph*) –
- **context** (*schema_salad.utils.ContextType*) –
- **defaultBase** (*str*) –
- **namespaces** (*Dict[str, rdflib.namespace.Namespace]*) –
- **defaultPrefix** (*str*) –

Return type

None

`schema_salad.jsonld_context.salat_to_jsonld_context(j, schema_ctx)`

Parameters

- **j** (*Iterable[MutableMapping[str, Any]]*) –
- **schema_ctx** (*MutableMapping[str, Any]*) –

Return type

Tuple[[schema_salad.utils.ContextType](#), [rdflib.Graph](#)]

`schema_salad.jsonld_context.fix_jsonld_ids(obj, ids)`

Add missing identity entries.

Parameters

- **obj** (*Union[[ruamel.yaml.comments.CommentMap](#), [float](#), [str](#), [ruamel.yaml.comments.CommentSeq](#)]*) –
- **ids** (*List[str]*) –

Return type

None

`schema_salad.jsonld_context.makerdf(workflow, wf, ctx, graph=None)`

Parameters

- **workflow** (*Optional[str]*) –
- **wf** (*Union[[ruamel.yaml.comments.CommentMap](#), [float](#), [str](#), [ruamel.yaml.comments.CommentSeq](#)]*) –
- **ctx** (*schema_salad.utils.ContextType*) –
- **graph** (*Optional[[rdflib.Graph](#)]*) –

Return type

[rdflib.Graph](#)

`schema_salad.main`

Command line interface to schema-salad.

Module Contents

Functions

```
printrdf(workflow, wf, ctx, sr)
```

```
arg_parser()
```

Build the argument parser.

```
main([argsl])
```

```
schema_salad.main.printrdf(workflow, wf, ctx, sr)
```

Parameters

- **workflow** (*str*) –
- **wf** (*Union[ruamel.yaml.comments.CommentedException, ruamel.yaml.comments.CommentedException]*) –
- **ctx** (*Dict[str, Any]*) –
- **sr** (*str*) –

Return type

None

```
schema_salad.main.arg_parser()
```

Build the argument parser.

Return type

argparse.ArgumentParser

```
schema_salad.main.main(argsl=None)
```

Parameters

argsl (*Optional[List[str]]*) –

Return type

int

```
schema_salad.makedoc
```

Module Contents

Classes

```
MyRenderer
```

Custom renderer with different representations of selected HTML tags.

```
ToC
```

```
RenderType
```

Functions

| | |
|------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| <i>escape_html</i> (s) | Escape HTML but otherwise preserve single quotes. |
| <i>vocab_type_name</i> (url) | Remove the avro namespace, if any. |
| <i>has_types</i> (items) | |
| <i>linkto</i> (item) | |
| <i>patch_fenced_code</i> (original_markdown_text, ...) | Reverts fenced code fragments found in the modified contents back to their original definition. |
| <i>to_id</i> (text) | |
| <i>number_headings</i> (toc, maindoc) | |
| <i>fix_doc</i> (doc) | |
| <i>avrold_doc</i> (j, outdoc, renderlist, redirects, brand, ...) | |
| <i>arg_parser</i> () | Build the argument parser. |
| <i>main</i> () | Shortcut entrypoint. |
| <i>makedoc</i> (stdout, schema[, redirects, only, brand, ...]) | Emit HTML representation of a given schema. |

Attributes

| |
|-------------------|
| <i>PluginName</i> |
| <i>basicTypes</i> |

schema_salad.makedoc.**PluginName**

schema_salad.makedoc.**escape_html**(s)

Escape HTML but otherwise preserve single quotes.

Parameters

s (*str*) –

Return type

str

schema_salad.makedoc.**vocab_type_name**(url)

Remove the avro namespace, if any.

Parameters

url (*str*) –

Return type

str

schema_salad.makedoc.**has_types**(items)

Parameters

items (*Any*) –

Return type

List[str]

schema_salad.makedoc.**linkto**(*item*)**Parameters****item** (str) –**Return type**

str

class schema_salad.makedoc.**MyRenderer**(*escape=True, allow_harmful_protocols=None*)

Bases: mistune.renderers.html.HTMLRenderer

Custom renderer with different representations of selected HTML tags.

heading(*text, level, **attrs*)

Override HTML heading creation with text IDs.

Parameters

- **text** (str) –
- **level** (int) –
- **attrs** (Any) –

Return type

str

text(*text*)

Don't escape quotation marks.

Parameters**text** (str) –**Return type**

str

inline_html(*html*)

Don't escape characters in predefined HTML within paragraph tags.

Parameters**html** (str) –**Return type**

str

block_html(*html*)

Don't escape characters nor wrap predefined HTML within paragraph tags.

Parameters**html** (str) –**Return type**

str

block_code(*code, info=None*)

Don't escape quotation marks.

Parameters

- **code** (*str*) –
- **info** (*Optional[str]*) –

Return type

str

`schema_salad.makedoc.patch_fenced_code(original_markdown_text, modified_markdown_text)`

Reverts fenced code fragments found in the modified contents back to their original definition.

Parameters

- **original_markdown_text** (*str*) –
- **modified_markdown_text** (*str*) –

Return type

str

`schema_salad.makedoc.to_id(text)`

Parameters

text (*str*) –

Return type

str

`class schema_salad.makedoc.ToC`

add_entry(*thisdepth, title*)

Add an entry to the table of contents.

Parameters

- **thisdepth** (*int*) –
- **title** (*str*) –

Return type

str

contents(*idn*)

Parameters

idn (*str*) –

Return type

str

`schema_salad.makedoc.basicTypes = ('https://w3id.org/cwl/salad#null',
'http://www.w3.org/2001/XMLSchema#boolean', ...`

`schema_salad.makedoc.number_headings(toc, maindoc)`

Parameters

- **toc** (*ToC*) –
- **maindoc** (*str*) –

Return type

str

```
schema_salad.makedoc.fix_doc(doc)
```

Parameters

doc (*Union*[*List*[*str*], *str*]) –

Return type

str

```
class schema_salad.makedoc.RenderType(toc, j, renderlist, redirects, primitiveType)
```

Parameters

- **toc** (*ToC*) –
- **j** (*List*[*Dict*[*str*, *Any*]]) –
- **renderlist** (*List*[*str*]) –
- **redirects** (*Dict*[*str*, *str*]) –
- **primitiveType** (*str*) –

```
typefmt(tp, redirects, nbsp=False, jsonldPredicate=None)
```

Parameters

- **tp** (*Any*) –
- **redirects** (*Dict*[*str*, *str*]) –
- **nbsp** (*bool*) –
- **jsonldPredicate** (*Optional*[*Union*[*Dict*[*str*, *str*], *str*]]) –

Return type

str

```
render_type(f, depth)
```

Parameters

- **f** (*Dict*[*str*, *Any*]) –
- **depth** (*int*) –

Return type

None

```
schema_salad.makedoc.avrold_doc(j, outdoc, renderlist, redirects, brand, brandlink, primtype,
                                brandstyle=None, brandinverse=False)
```

Parameters

- **j** (*List*[*Dict*[*str*, *Any*]]) –
- **outdoc** (*IO*[*Any*]) –
- **renderlist** (*List*[*str*]) –
- **redirects** (*Dict*[*str*, *str*]) –
- **brand** (*str*) –
- **brandlink** (*str*) –
- **primtype** (*str*) –
- **brandstyle** (*Optional*[*str*]) –

- **brandinverse** (*Optional[bool]*) –

Return type

None

`schema_salad.makedoc.arg_parser()`

Build the argument parser.

Return type

`argparse.ArgumentParser`

`schema_salad.makedoc.main()`

Shortcut entrypoint.

Return type

None

`schema_salad.makedoc.makedoc(stdout, schema, redirects=None, only=None, brand=None, brandlink=None, printype=None, brandstyle=None, brandinverse=False)`

Emit HTML representation of a given schema.

Parameters

- **stdout** (*IO[Any]*) –
- **schema** (*str*) –
- **redirects** (*Optional[List[str]]*) –
- **only** (*Optional[List[str]]*) –
- **brand** (*Optional[str]*) –
- **brandlink** (*Optional[str]*) –
- **printype** (*Optional[str]*) –
- **brandstyle** (*Optional[str]*) –
- **brandinverse** (*Optional[bool]*) –

Return type

None

`schema_salad.metaschema`

Module Contents

Classes

| | |
|--------------------------|---------------------------------------------------------------------------------|
| <i>LoadingOptions</i> | |
| <i>Saveable</i> | Mark classes than have a save() and fromDoc() function. |
| <i>Documented</i> | Mark classes than have a save() and fromDoc() function. |
| <i>RecordField</i> | A field of a record. |
| <i>RecordSchema</i> | Mark classes than have a save() and fromDoc() function. |
| <i>EnumSchema</i> | Define an enumerated type. |
| <i>ArraySchema</i> | Mark classes than have a save() and fromDoc() function. |
| <i>MapSchema</i> | Mark classes than have a save() and fromDoc() function. |
| <i>UnionSchema</i> | Mark classes than have a save() and fromDoc() function. |
| <i>JsonldPredicate</i> | Attached to a record field to define how the parent record field is handled for |
| <i>SpecializeDef</i> | Mark classes than have a save() and fromDoc() function. |
| <i>NamedType</i> | Mark classes than have a save() and fromDoc() function. |
| <i>DocType</i> | Mark classes than have a save() and fromDoc() function. |
| <i>SchemaDefinedType</i> | Abstract base for schema-defined types. |
| <i>SaladRecordField</i> | A field of a record. |
| <i>SaladRecordSchema</i> | Mark classes than have a save() and fromDoc() function. |
| <i>SaladEnumSchema</i> | Define an enumerated type. |
| <i>SaladMapSchema</i> | Define a map type. |
| <i>SaladUnionSchema</i> | Define a union type. |
| <i>Documentation</i> | A documentation section. This type exists to facilitate self-documenting |

Functions

| | |
|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| <i>load_field</i> (val, fieldtype, baseuri, loadingOptions[, lc]) | Load field. |
| <i>extract_type</i> (val_type) | Take a type of value, and extracts the value as a string. |
| <i>convert_typing</i> (val_type) | Normalize type names to schema-salad types. |
| <i>parse_errors</i> (error_message) | Parse error messages from several loaders into one error message. |
| <i>save</i> (val[, top, base_url, relative_uris]) | |
| <i>save_with_metadata</i> (val, valLoadingOpts[, top, ...]) | Save and set \$namespaces, \$schemas, \$base and any other metadata fields at the top level. |
| <i>expand_url</i> (url, base_url, loadingOptions[, scoped_id, ...]) | |
| <i>file_uri</i> (path[, split_frag]) | Transform a file path into a URL with file scheme. |
| <i>prefix_url</i> (url, namespaces) | Expand short forms into full URLs using the given namespace dictionary. |
| <i>save_relative_uri</i> (uri, base_url, scoped_id, ref_scope, ...) | Convert any URI to a relative one, obeying the scoping rules. |
| <i>shortname</i> (inputid) | Compute the shortname of a fully qualified identifier. |
| <i>parser_info</i> () | |
| <i>load_document</i> (doc[, baseuri, loadingOptions]) | |
| <i>load_document_with_metadata</i> (doc[, baseuri, ...]) | |
| <i>load_document_by_string</i> (string, uri[, loadingOptions]) | |
| <i>load_document_by_yaml</i> (yaml, uri[, loadingOptions]) | Shortcut to load via a YAML object. |

Attributes

| |
|------------------|
| <i>IdxType</i> |
| <i>save_type</i> |
| <i>strtype</i> |
| <i>inttype</i> |
| <i>floattype</i> |
| <i>booltype</i> |
| <i>None_type</i> |
| <i>Any_type</i> |

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| | |
|-----------------------------------------------------|----------------------------------------------------------------|
| <i>PrimitiveTypeLoader</i> | Names of salad data types (based on Avro schema declarations). |
| <i>AnyLoader</i> | The Any type validates for any non-null value. |
| <i>RecordFieldLoader</i> | |
| <i>RecordSchemaLoader</i> | |
| <i>EnumSchemaLoader</i> | |
| <i>ArraySchemaLoader</i> | |
| <i>MapSchemaLoader</i> | |
| <i>UnionSchemaLoader</i> | |
| <i>JsonldPredicateLoader</i> | |
| <i>SpecializeDefLoader</i> | |
| <i>SaladRecordFieldLoader</i> | |
| <i>SaladRecordSchemaLoader</i> | |
| <i>SaladEnumSchemaLoader</i> | |
| <i>SaladMapSchemaLoader</i> | |
| <i>SaladUnionSchemaLoader</i> | |
| <i>DocumentationLoader</i> | |
| <i>array_of_strtype</i> | |
| <i>union_of_None_type_or_strtype_or_array_of_si</i> | |
| <i>uri_strtype_True_False_None_None</i> | |
| <i>union_of_PrimitiveTypeLoader_or_RecordSchema</i> | <i>der_or_MapSche</i> |
| <i>array_of_union_of_PrimitiveTypeLoader_or_Re</i> | <i>SchemaLoader_o</i> |
| <i>union_of_PrimitiveTypeLoader_or_RecordSchema</i> | <i>der_or_MapSche</i> |
| <i>typedsl_union_of_PrimitiveTypeLoader_or_Reco</i> | <i>chemaLoader_or</i> |
| <i>array_of_RecordFieldLoader</i> | |
| <i>union_of_None_type_or_array_of_RecordFieldLo</i> | |
| <i>idmap_fields_union_of_None_type_or_array_of_</i> | |

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| |
|-----------------------------------------------------|
| <i>Record_nameLoader</i> |
| <i>typedsl_Record_nameLoader_2</i> |
| <i>union_of_None_type_or_strtype</i> |
| <i>uri_union_of_None_type_or_strtype_True_False</i> |
| <i>uri_array_of_strtype_True_False_None_None</i> |
| <i>Enum_nameLoader</i> |
| <i>typedsl_Enum_nameLoader_2</i> |
| <i>uri_union_of_PrimitiveTypeLoader_or_RecordSc</i> |
| <i>Array_nameLoader</i> |
| <i>typedsl_Array_nameLoader_2</i> |
| <i>Map_nameLoader</i> |
| <i>typedsl_Map_nameLoader_2</i> |
| <i>Union_nameLoader</i> |
| <i>typedsl_Union_nameLoader_2</i> |
| <i>union_of_None_type_or_booltype</i> |
| <i>union_of_None_type_or_inttype</i> |
| <i>uri_strtype_False_False_1_None</i> |
| <i>uri_union_of_None_type_or_strtype_False_Fals</i> |
| <i>uri_union_of_None_type_or_strtype_or_array_</i> |
| <i>union_of_None_type_or_strtype_or_JsonldPredi</i> |
| <i>union_of_None_type_or_Any_type</i> |
| <i>array_of_SaladRecordFieldLoader</i> |
| <i>union_of_None_type_or_array_of_SaladRecordFi</i> |
| <i>idmap_fields_union_of_None_type_or_array_of_</i> |
| <i>uri_union_of_None_type_or_strtype_or_array_</i> |
| <i>array_of_SpecializeDefLoader</i> |

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| | |
|-----------------------------------------------------------|-----------------------------|
| <code>union_of_None_type_or_array_of_SpecializeDe</code> | |
| <code>idmap_specialize_union_of_None_type_or_array</code> | |
| <code>Documentation_nameLoader</code> | |
| <code>typedsl_Documentation_nameLoader_2</code> | |
| <code>union_of_SaladRecordSchemaLoader_or_SaladEn</code> | <code>adUnionSchemaL</code> |
| <code>array_of_union_of_SaladRecordSchemaLoader_or</code> | <code>er_or_SaladUni</code> |
| <code>union_of_SaladRecordSchemaLoader_or_SaladEn</code> | <code>adUnionSchemaL</code> |

`schema_salad.metaschema.IdxType`

class `schema_salad.metaschema.LoadingOptions`(*fetcher=None, namespaces=None, schemas=None, fileuri=None, copyfrom=None, original_doc=None, addl_metadata=None, baseuri=None, idx=None, imports=None, includes=None, no_link_check=None, container=None*)

Parameters

- **fetcher** (*Optional[`schema_salad.fetcher.Fetcher`]*) –
- **namespaces** (*Optional[`Dict[str, str]`]*) –
- **schemas** (*Optional[`List[str]`]*) –
- **fileuri** (*Optional[`str`]*) –
- **copyfrom** (*Optional[`LoadingOptions`]*) –
- **original_doc** (*Optional[`Any`]*) –
- **addl_metadata** (*Optional[`Dict[str, str]`]*) –
- **baseuri** (*Optional[`str`]*) –
- **idx** (*Optional[`IdxType`]*) –
- **imports** (*Optional[`List[str]`]*) –
- **includes** (*Optional[`List[str]`]*) –
- **no_link_check** (*Optional[`bool`]*) –
- **container** (*Optional[`str`]*) –

property graph: `rdflib.Graph`

Generate a merged `rdflib.Graph` from all entries in `self.schemas`.

Return type

`rdflib.Graph`

idx: `IdxType`

fileuri: `str | None`

```
baseuri: str
namespaces: MutableMapping[str, str]
schemas: MutableSequence[str]
original_doc: Any | None
addl_metadata: MutableMapping[str, Any]
fetcher: schema_salad.fetcher.Fetcher
vocab: Dict[str, str]
rvocab: Dict[str, str]
cache: schema_salad.utils.CacheType
imports: List[str]
includes: List[str]
no_link_check: bool | None
container: str | None
```

```
class schema_salad.metaschema.Saveable
    Bases: abc.ABC

    Mark classes than have a save() and fromDoc() function.

    abstract classmethod fromDoc(_doc, baseuri, loadingOptions, docRoot=None)
        Construct this object from the result of yaml.load().

        Parameters
            • _doc (Any) –
            • baseuri (str) –
            • loadingOptions (LoadingOptions) –
            • docRoot (Optional[str]) –

        Return type
            Saveable

    abstract save(top=False, base_url="", relative_uris=True)
        Convert this object to a JSON/YAML friendly dictionary.

        Parameters
            • top (bool) –
            • base_url (str) –
            • relative_uris (bool) –

        Return type
            Dict[str, Any]
```

`schema_salad.metaschema.load_field(val, fieldtype, baseuri, loadingOptions, lc=None)`

Load field.

Parameters

- **val** (`Union[str, Dict[str, str]]`) –
- **fieldtype** (`_Loader`) –
- **baseuri** (`str`) –
- **loadingOptions** (`LoadingOptions`) –
- **lc** (`Optional[List[Any]]`) –

Return type

`Any`

`schema_salad.metaschema.save_type`

`schema_salad.metaschema.extract_type(val_type)`

Take a type of value, and extracts the value as a string.

Parameters

val_type (`Type[Any]`) –

Return type

`str`

`schema_salad.metaschema.convert_typing(val_type)`

Normalize type names to schema-salad types.

Parameters

val_type (`str`) –

Return type

`str`

`schema_salad.metaschema.parse_errors(error_message)`

Parse error messages from several loaders into one error message.

Parameters

error_message (`str`) –

Return type

`Tuple[str, str, str]`

`schema_salad.metaschema.save(val, top=True, base_url="", relative_uris=True)`

Parameters

- **val** (`Any`) –
- **top** (`bool`) –
- **base_url** (`str`) –
- **relative_uris** (`bool`) –

Return type

`save_type`

`schema_salad.metaschema.save_with_metadata(val, valLoadingOpts, top=True, base_url="", relative_uris=True)`

Save and set \$namespaces, \$schemas, \$base and any other metadata fields at the top level.

Parameters

- **val** (*Any*) –
- **valLoadingOpts** (*LoadingOptions*) –
- **top** (*bool*) –
- **base_url** (*str*) –
- **relative_uris** (*bool*) –

Return type

save_type

`schema_salad.metaschema.expand_url(url, base_url, loadingOptions, scoped_id=False, vocab_term=False, scoped_ref=None)`

Parameters

- **url** (*str*) –
- **base_url** (*str*) –
- **loadingOptions** (*LoadingOptions*) –
- **scoped_id** (*bool*) –
- **vocab_term** (*bool*) –
- **scoped_ref** (*Optional[int]*) –

Return type

str

`schema_salad.metaschema.file_uri(path, split_frag=False)`

Transform a file path into a URL with file scheme.

Parameters

- **path** (*str*) –
- **split_frag** (*bool*) –

Return type

str

`schema_salad.metaschema.prefix_url(url, namespaces)`

Expand short forms into full URLs using the given namespace dictionary.

Parameters

- **url** (*str*) –
- **namespaces** (*Dict[str, str]*) –

Return type

str

`schema_salad.metaschema.save_relative_uri(uri, base_url, scoped_id, ref_scope, relative_uris)`

Convert any URI to a relative one, obeying the scoping rules.

Parameters

- **uri** (*Any*) –
- **base_url** (*str*) –
- **scoped_id** (*bool*) –
- **ref_scope** (*Optional[int]*) –
- **relative_uris** (*bool*) –

Return type

Any

`schema_salad.metaschema.shortname(inputid)`

Compute the shortname of a fully qualified identifier.

See https://w3id.org/cwl/v1.2/SchemaSalad.html#Short_names.

Parameters

inputid (*str*) –

Return type

str

`schema_salad.metaschema.parser_info()`

Return type

str

class `schema_salad.metaschema.Documented`

Bases: *Saveable*

Mark classes than have a `save()` and `fromDoc()` function.

class `schema_salad.metaschema.RecordField(name, type_, doc=None, extension_fields=None, loadingOptions=None)`

Bases: *Documented*

A field of a record.

Parameters

- **name** (*Any*) –
- **type_** (*Any*) –
- **doc** (*Optional[Any]*) –
- **extension_fields** (*Optional[Dict[str, Any]]*) –
- **loadingOptions** (*Optional>LoadingOptions*) –

attrs

__eq__(*other*)

Return self==value.

Parameters

other (*Any*) –

Return type

bool

__hash__()

Return hash(self).

Return type

int

classmethod **fromDoc**(*doc*, *baseuri*, *loadingOptions*, *docRoot=None*)

Construct this object from the result of `yaml.load()`.

Parameters

- **doc** (*Any*) –
- **baseuri** (*str*) –
- **loadingOptions** (*LoadingOptions*) –
- **docRoot** (*Optional[str]*) –

Return type

RecordField

save(*top=False*, *base_url=""*, *relative_uris=True*)

Convert this object to a JSON/YAML friendly dictionary.

Parameters

- **top** (*bool*) –
- **base_url** (*str*) –
- **relative_uris** (*bool*) –

Return type

Dict[str, Any]

class `schema_salad.metaschema.RecordSchema`(*type_*, *fields=None*, *extension_fields=None*,
loadingOptions=None)

Bases: *Saveable*

Mark classes than have a `save()` and `fromDoc()` function.

Parameters

- **type_** (*Any*) –
- **fields** (*Optional[Any]*) –
- **extension_fields** (*Optional[Dict[str, Any]]*) –
- **loadingOptions** (*Optional>LoadingOptions*) –

attrs

__eq__(*other*)

Return self==value.

Parameters

other (*Any*) –

Return type

bool

__hash__()

Return hash(self).

Return type

int

classmethod **fromDoc**(*doc*, *baseuri*, *loadingOptions*, *docRoot=None*)

Construct this object from the result of `yaml.load()`.

Parameters

- **doc** (*Any*) –
- **baseuri** (*str*) –
- **loadingOptions** (*LoadingOptions*) –
- **docRoot** (*Optional[str]*) –

Return type

RecordSchema

save(*top=False*, *base_url=""*, *relative_uris=True*)

Convert this object to a JSON/YAML friendly dictionary.

Parameters

- **top** (*bool*) –
- **base_url** (*str*) –
- **relative_uris** (*bool*) –

Return type

Dict[str, Any]

class `schema_salad.metaschema.EnumSchema`(*symbols*, *type_*, *name=None*, *extension_fields=None*, *loadingOptions=None*)

Bases: *Saveable*

Define an enumerated type.

Parameters

- **symbols** (*Any*) –
- **type_** (*Any*) –
- **name** (*Optional[Any]*) –
- **extension_fields** (*Optional[Dict[str, Any]]*) –
- **loadingOptions** (*Optional>LoadingOptions*) –

attrs

__eq__(*other*)

Return self==value.

Parameters

other (*Any*) –

Return type

bool

__hash__()

Return hash(self).

Return type

int

classmethod fromDoc(*doc*, *baseuri*, *loadingOptions*, *docRoot=None*)

Construct this object from the result of `yaml.load()`.

Parameters

- **doc** (*Any*) –
- **baseuri** (*str*) –
- **loadingOptions** (*LoadingOptions*) –
- **docRoot** (*Optional[str]*) –

Return type

EnumSchema

save(*top=False*, *base_url=""*, *relative_uris=True*)

Convert this object to a JSON/YAML friendly dictionary.

Parameters

- **top** (*bool*) –
- **base_url** (*str*) –
- **relative_uris** (*bool*) –

Return type

Dict[str, Any]

class `schema_salad.metaschema.ArraySchema`(*items*, *type_*, *extension_fields=None*, *loadingOptions=None*)

Bases: *Saveable*

Mark classes than have a `save()` and `fromDoc()` function.

Parameters

- **items** (*Any*) –
- **type_** (*Any*) –
- **extension_fields** (*Optional[Dict[str, Any]]*) –
- **loadingOptions** (*Optional>LoadingOptions*) –

attrs

__eq__(*other*)

Return self==value.

Parameters

other (*Any*) –

Return type

bool

__hash__()

Return hash(self).

Return type

int

classmethod fromDoc(*doc*, *baseuri*, *loadingOptions*, *docRoot=None*)

Construct this object from the result of `yaml.load()`.

Parameters

- **doc** (*Any*) –
- **baseuri** (*str*) –
- **loadingOptions** (*LoadingOptions*) –
- **docRoot** (*Optional[str]*) –

Return type

ArraySchema

save(*top=False*, *base_url=""*, *relative_uris=True*)

Convert this object to a JSON/YAML friendly dictionary.

Parameters

- **top** (*bool*) –
- **base_url** (*str*) –
- **relative_uris** (*bool*) –

Return type

Dict[str, Any]

class `schema_salad.metaschema.MapSchema`(*type_*, *values*, *extension_fields=None*, *loadingOptions=None*)

Bases: *Saveable*

Mark classes than have a `save()` and `fromDoc()` function.

Parameters

- **type_** (*Any*) –
- **values** (*Any*) –
- **extension_fields** (*Optional[Dict[str, Any]]*) –
- **loadingOptions** (*Optional>LoadingOptions*) –

attrs

__eq__(*other*)

Return self==value.

Parameters

other (*Any*) –

Return type

bool

__hash__()

Return hash(self).

Return type

int

classmethod fromDoc(*doc*, *baseuri*, *loadingOptions*, *docRoot=None*)

Construct this object from the result of `yaml.load()`.

Parameters

- **doc** (*Any*) –
- **baseuri** (*str*) –
- **loadingOptions** (*LoadingOptions*) –
- **docRoot** (*Optional[str]*) –

Return type

MapSchema

save(*top=False*, *base_url=""*, *relative_uris=True*)

Convert this object to a JSON/YAML friendly dictionary.

Parameters

- **top** (*bool*) –
- **base_url** (*str*) –
- **relative_uris** (*bool*) –

Return type

Dict[str, Any]

class `schema_salad.metaschema.UnionSchema`(*names*, *type_*, *extension_fields=None*, *loadingOptions=None*)

Bases: *Saveable*

Mark classes than have a `save()` and `fromDoc()` function.

Parameters

- **names** (*Any*) –
- **type_** (*Any*) –
- **extension_fields** (*Optional[Dict[str, Any]]*) –
- **loadingOptions** (*Optional>LoadingOptions*) –

attrs

__eq__(*other*)

Return self==value.

Parameters

other (*Any*) –

Return type

bool

__hash__()

Return hash(self).

Return type

int

classmethod fromDoc(*doc*, *baseuri*, *loadingOptions*, *docRoot=None*)

Construct this object from the result of `yaml.load()`.

Parameters

- **doc** (*Any*) –
- **baseuri** (*str*) –
- **loadingOptions** (*LoadingOptions*) –
- **docRoot** (*Optional[str]*) –

Return type

UnionSchema

save(*top=False*, *base_url=""*, *relative_uris=True*)

Convert this object to a JSON/YAML friendly dictionary.

Parameters

- **top** (*bool*) –
- **base_url** (*str*) –
- **relative_uris** (*bool*) –

Return type

Dict[str, Any]

class `schema_salad.metaschema.JsonldPredicate`(*_id=None*, *_type=None*, *_container=None*,
identity=None, *noLinkCheck=None*, *mapSubject=None*,
mapPredicate=None, *refScope=None*, *typeDSL=None*,
secondaryFilesDSL=None, *subscope=None*,
extension_fields=None, *loadingOptions=None*)

Bases: *Saveable*

Attached to a record field to define how the parent record field is handled for URI resolution and JSON-LD context generation.

Parameters

- **_id** (*Optional[Any]*) –
- **_type** (*Optional[Any]*) –
- **_container** (*Optional[Any]*) –

- **identity** (*Optional*[*Any*]) –
- **noLinkCheck** (*Optional*[*Any*]) –
- **mapSubject** (*Optional*[*Any*]) –
- **mapPredicate** (*Optional*[*Any*]) –
- **refScope** (*Optional*[*Any*]) –
- **typeDSL** (*Optional*[*Any*]) –
- **secondaryFilesDSL** (*Optional*[*Any*]) –
- **subscope** (*Optional*[*Any*]) –
- **extension_fields** (*Optional*[*Dict*[*str*, *Any*]]) –
- **loadingOptions** (*Optional*[*LoadingOptions*]) –

attrs

__eq__(*other*)

Return self==value.

Parameters

other (*Any*) –

Return type

bool

__hash__()

Return hash(self).

Return type

int

classmethod fromDoc(*doc*, *baseuri*, *loadingOptions*, *docRoot=None*)

Construct this object from the result of `yaml.load()`.

Parameters

- **doc** (*Any*) –
- **baseuri** (*str*) –
- **loadingOptions** (*LoadingOptions*) –
- **docRoot** (*Optional*[*str*]) –

Return type

JsonldPredicate

save(*top=False*, *base_url=""*, *relative_uris=True*)

Convert this object to a JSON/YAML friendly dictionary.

Parameters

- **top** (*bool*) –
- **base_url** (*str*) –
- **relative_uris** (*bool*) –

Return type

Dict[*str*, *Any*]

```
class schema_salad.metaschema.SpecializeDef(specializeFrom, specializeTo, extension_fields=None,  
                                           loadingOptions=None)
```

Bases: [Saveable](#)

Mark classes than have a save() and fromDoc() function.

Parameters

- **specializeFrom** (*Any*) –
- **specializeTo** (*Any*) –
- **extension_fields** (*Optional[Dict[str, Any]]*) –
- **loadingOptions** (*Optional[LoadingOptions]*) –

attrs

__eq__(*other*)

Return self==value.

Parameters

- **other** (*Any*) –

Return type

[bool](#)

__hash__()

Return hash(self).

Return type

[int](#)

classmethod fromDoc(*doc, baseuri, loadingOptions, docRoot=None*)

Construct this object from the result of yaml.load().

Parameters

- **doc** (*Any*) –
- **baseuri** ([str](#)) –
- **loadingOptions** ([LoadingOptions](#)) –
- **docRoot** (*Optional[str]*) –

Return type

[SpecializeDef](#)

save(*top=False, base_url="", relative_uris=True*)

Convert this object to a JSON/YAML friendly dictionary.

Parameters

- **top** ([bool](#)) –
- **base_url** ([str](#)) –
- **relative_uris** ([bool](#)) –

Return type

[Dict\[str, Any\]](#)

class schema_salad.metaschema.NamedType

Bases: *Saveable*

Mark classes than have a save() and fromDoc() function.

class schema_salad.metaschema.DocType

Bases: *Documented*

Mark classes than have a save() and fromDoc() function.

class schema_salad.metaschema.SchemaDefinedType

Bases: *DocType*

Abstract base for schema-defined types.

class schema_salad.metaschema.SaladRecordField(*name, type_, doc=None, jsonldPredicate=None, default=None, extension_fields=None, loadingOptions=None*)

Bases: *RecordField*

A field of a record.

Parameters

- **name** (*Any*) –
- **type_** (*Any*) –
- **doc** (*Optional[Any]*) –
- **jsonldPredicate** (*Optional[Any]*) –
- **default** (*Optional[Any]*) –
- **extension_fields** (*Optional[Dict[str, Any]]*) –
- **loadingOptions** (*Optional[LoadingOptions]*) –

attrs

__eq__(*other*)

Return self==value.

Parameters

- **other** (*Any*) –

Return type

bool

__hash__()

Return hash(self).

Return type

int

classmethod `fromDoc(doc, baseuri, loadingOptions, docRoot=None)`

Construct this object from the result of `yaml.load()`.

Parameters

- **doc** (*Any*) –
- **baseuri** (*str*) –
- **loadingOptions** (*LoadingOptions*) –
- **docRoot** (*Optional[str]*) –

Return type

SaladRecordField

save(*top=False, base_url="", relative_uris=True*)

Convert this object to a JSON/YAML friendly dictionary.

Parameters

- **top** (*bool*) –
- **base_url** (*str*) –
- **relative_uris** (*bool*) –

Return type

Dict[str, Any]

class `schema_salad.metaschema.SaladRecordSchema(name, type_, inVocab=None, fields=None, doc=None, docParent=None, docChild=None, docAfter=None, jsonldPredicate=None, documentRoot=None, abstract=None, extends=None, specialize=None, extension_fields=None, loadingOptions=None)`

Bases: *NamedType, RecordSchema, SchemaDefinedType*

Mark classes than have a `save()` and `fromDoc()` function.

Parameters

- **name** (*Any*) –
- **type_** (*Any*) –
- **inVocab** (*Optional[Any]*) –
- **fields** (*Optional[Any]*) –
- **doc** (*Optional[Any]*) –
- **docParent** (*Optional[Any]*) –
- **docChild** (*Optional[Any]*) –
- **docAfter** (*Optional[Any]*) –
- **jsonldPredicate** (*Optional[Any]*) –
- **documentRoot** (*Optional[Any]*) –
- **abstract** (*Optional[Any]*) –
- **extends** (*Optional[Any]*) –
- **specialize** (*Optional[Any]*) –

- **extension_fields** (*Optional*[*Dict*[*str*, *Any*]]) –
- **loadingOptions** (*Optional*[*LoadingOptions*]) –

attrs

__eq__(*other*)

Return self==value.

Parameters

other (*Any*) –

Return type

bool

__hash__()

Return hash(self).

Return type

int

classmethod **fromDoc**(*doc*, *baseuri*, *loadingOptions*, *docRoot=None*)

Construct this object from the result of `yaml.load()`.

Parameters

- **doc** (*Any*) –
- **baseuri** (*str*) –
- **loadingOptions** (*LoadingOptions*) –
- **docRoot** (*Optional*[*str*]) –

Return type

SaladRecordSchema

save(*top=False*, *base_url=""*, *relative_uris=True*)

Convert this object to a JSON/YAML friendly dictionary.

Parameters

- **top** (*bool*) –
- **base_url** (*str*) –
- **relative_uris** (*bool*) –

Return type

Dict[*str*, *Any*]

class `schema_salad.metaschema.SaladEnumSchema`(*symbols*, *type_*, *name=None*, *inVocab=None*, *doc=None*, *docParent=None*, *docChild=None*, *docAfter=None*, *jsonldPredicate=None*, *documentRoot=None*, *extends=None*, *extension_fields=None*, *loadingOptions=None*)

Bases: *NamedType*, *EnumSchema*, *SchemaDefinedType*

Define an enumerated type.

Parameters

- **symbols** (*Any*) –

- **type_** (*Any*) –
- **name** (*Optional[Any]*) –
- **inVocab** (*Optional[Any]*) –
- **doc** (*Optional[Any]*) –
- **docParent** (*Optional[Any]*) –
- **docChild** (*Optional[Any]*) –
- **docAfter** (*Optional[Any]*) –
- **jsonldPredicate** (*Optional[Any]*) –
- **documentRoot** (*Optional[Any]*) –
- **extends** (*Optional[Any]*) –
- **extension_fields** (*Optional[Dict[str, Any]]*) –
- **loadingOptions** (*Optional[LoadingOptions]*) –

attrs

__eq__(*other*)

Return self==value.

Parameters

other (*Any*) –

Return type

bool

__hash__()

Return hash(self).

Return type

int

classmethod fromDoc(*doc, baseuri, loadingOptions, docRoot=None*)

Construct this object from the result of `yaml.load()`.

Parameters

- **doc** (*Any*) –
- **baseuri** (*str*) –
- **loadingOptions** (*LoadingOptions*) –
- **docRoot** (*Optional[str]*) –

Return type

SaladEnumSchema

save(*top=False, base_url="", relative_uris=True*)

Convert this object to a JSON/YAML friendly dictionary.

Parameters

- **top** (*bool*) –
- **base_url** (*str*) –
- **relative_uris** (*bool*) –

Return type

Dict[str, Any]

```
class schema_salad.metaschema.SaladMapSchema(name, type_, values, inVocab=None, doc=None,
                                              docParent=None, docChild=None, docAfter=None,
                                              jsonldPredicate=None, documentRoot=None,
                                              extension_fields=None, loadingOptions=None)
```

Bases: *NamedType*, *MapSchema*, *SchemaDefinedType*

Define a map type.

Parameters

- **name** (Any) –
- **type_** (Any) –
- **values** (Any) –
- **inVocab** (Optional[Any]) –
- **doc** (Optional[Any]) –
- **docParent** (Optional[Any]) –
- **docChild** (Optional[Any]) –
- **docAfter** (Optional[Any]) –
- **jsonldPredicate** (Optional[Any]) –
- **documentRoot** (Optional[Any]) –
- **extension_fields** (Optional[Dict[str, Any]]) –
- **loadingOptions** (Optional[LoadingOptions]) –

attrs**__eq__**(other)

Return self==value.

Parameters**other** (Any) –**Return type**

bool

__hash__()

Return hash(self).

Return type

int

```
classmethod fromDoc(doc, baseuri, loadingOptions, docRoot=None)
```

Construct this object from the result of yaml.load().

Parameters

- **doc** (Any) –
- **baseuri** (str) –
- **loadingOptions** (LoadingOptions) –

- **docRoot** (*Optional*[*str*]) –

Return type*SaladMapSchema***save**(*top=False*, *base_url=""*, *relative_uris=True*)

Convert this object to a JSON/YAML friendly dictionary.

Parameters

- **top** (*bool*) –
- **base_url** (*str*) –
- **relative_uris** (*bool*) –

Return typeDict[*str*, *Any*]

```
class schema_salad.metaschema.SaladUnionSchema(name, names, type_, inVocab=None, doc=None,
docParent=None, docChild=None, docAfter=None,
documentRoot=None, extension_fields=None,
loadingOptions=None)
```

Bases: *NamedType*, *UnionSchema*, *DocType*

Define a union type.

Parameters

- **name** (*Any*) –
- **names** (*Any*) –
- **type_** (*Any*) –
- **inVocab** (*Optional*[*Any*]) –
- **doc** (*Optional*[*Any*]) –
- **docParent** (*Optional*[*Any*]) –
- **docChild** (*Optional*[*Any*]) –
- **docAfter** (*Optional*[*Any*]) –
- **documentRoot** (*Optional*[*Any*]) –
- **extension_fields** (*Optional*[Dict[*str*, *Any*]]) –
- **loadingOptions** (*Optional*[*LoadingOptions*]) –

attrs**__eq__**(*other*)

Return self==value.

Parameters

- **other** (*Any*) –

Return type*bool*

__hash__()

Return hash(self).

Return type

`int`

classmethod fromDoc(*doc*, *baseuri*, *loadingOptions*, *docRoot=None*)

Construct this object from the result of `yaml.load()`.

Parameters

- **doc** (*Any*) –
- **baseuri** (*str*) –
- **loadingOptions** (*LoadingOptions*) –
- **docRoot** (*Optional[str]*) –

Return type

SaladUnionSchema

save(*top=False*, *base_url=""*, *relative_uris=True*)

Convert this object to a JSON/YAML friendly dictionary.

Parameters

- **top** (*bool*) –
- **base_url** (*str*) –
- **relative_uris** (*bool*) –

Return type

`Dict[str, Any]`

class `schema_salad.metaschema.Documentation`(*name*, *type_*, *inVocab=None*, *doc=None*, *docParent=None*, *docChild=None*, *docAfter=None*, *extension_fields=None*, *loadingOptions=None*)

Bases: *NamedType*, *DocType*

A documentation section. This type exists to facilitate self-documenting schemas but has no role in formal validation.

Parameters

- **name** (*Any*) –
- **type_** (*Any*) –
- **inVocab** (*Optional[Any]*) –
- **doc** (*Optional[Any]*) –
- **docParent** (*Optional[Any]*) –
- **docChild** (*Optional[Any]*) –
- **docAfter** (*Optional[Any]*) –
- **extension_fields** (*Optional[Dict[str, Any]]*) –
- **loadingOptions** (*Optional>LoadingOptions*) –

attrs

__eq__(*other*)

Return self==value.

Parameters

other (*Any*) –

Return type

bool

__hash__()

Return hash(self).

Return type

int

classmethod fromDoc(*doc*, *baseuri*, *loadingOptions*, *docRoot=None*)

Construct this object from the result of `yaml.load()`.

Parameters

- **doc** (*Any*) –
- **baseuri** (*str*) –
- **loadingOptions** (*LoadingOptions*) –
- **docRoot** (*Optional[str]*) –

Return type

Documentation

save(*top=False*, *base_url=""*, *relative_uris=True*)

Convert this object to a JSON/YAML friendly dictionary.

Parameters

- **top** (*bool*) –
- **base_url** (*str*) –
- **relative_uris** (*bool*) –

Return type

`Dict[str, Any]`

`schema_salad.metaschema.strtype`

`schema_salad.metaschema.inttype`

`schema_salad.metaschema.floattype`

`schema_salad.metaschema.booltype`

`schema_salad.metaschema.None_type`

`schema_salad.metaschema.Any_type`

`schema_salad.metaschema.PrimitiveTypeLoader`

Names of salad data types (based on Avro schema declarations).

Refer to the [Avro schema declaration documentation](<https://avro.apache.org/docs/current/spec.html#schemas>) for detailed information.

null: no value boolean: a binary value int: 32-bit signed integer long: 64-bit signed integer float: single precision (32-bit) IEEE 754 floating-point number double: double precision (64-bit) IEEE 754 floating-point number string: Unicode character sequence

`schema_salad.metaschema.AnyLoader`

The **Any** type validates for any non-null value.

`schema_salad.metaschema.RecordFieldLoader`

`schema_salad.metaschema.RecordSchemaLoader`

`schema_salad.metaschema.EnumSchemaLoader`

`schema_salad.metaschema.ArraySchemaLoader`

`schema_salad.metaschema.MapSchemaLoader`

`schema_salad.metaschema.UnionSchemaLoader`

`schema_salad.metaschema.JsonldPredicateLoader`

`schema_salad.metaschema.SpecializeDefLoader`

`schema_salad.metaschema.SaladRecordFieldLoader`

`schema_salad.metaschema.SaladRecordSchemaLoader`

`schema_salad.metaschema.SaladEnumSchemaLoader`

`schema_salad.metaschema.SaladMapSchemaLoader`

`schema_salad.metaschema.SaladUnionSchemaLoader`

`schema_salad.metaschema.DocumentationLoader`

`schema_salad.metaschema.array_of_strtype`

`schema_salad.metaschema.union_of_None_type_or_strtype_or_array_of_strtype`

`schema_salad.metaschema.uri_strtype_True_False_None_None`

`schema_salad.metaschema.`

`union_of_PrimitiveTypeLoader_or_RecordSchemaLoader_or_EnumSchemaLoader_or_ArraySchemaLoader_or_MapSchemaLoader`

`schema_salad.metaschema.`

`array_of_union_of_PrimitiveTypeLoader_or_RecordSchemaLoader_or_EnumSchemaLoader_or_ArraySchemaLoader_or_MapSchemaLoader`

`schema_salad.metaschema.`

`union_of_PrimitiveTypeLoader_or_RecordSchemaLoader_or_EnumSchemaLoader_or_ArraySchemaLoader_or_MapSchemaLoader`

`schema_salad.metaschema.`

`typedsl_union_of_PrimitiveTypeLoader_or_RecordSchemaLoader_or_EnumSchemaLoader_or_ArraySchemaLoader_or_MapSchemaLoader`

`schema_salad.metaschema.array_of_RecordFieldLoader`

schema_salad.metaschema.union_of_None_type_or_array_of_RecordFieldLoader
schema_salad.metaschema.idmap_fields_union_of_None_type_or_array_of_RecordFieldLoader
schema_salad.metaschema.Record_nameLoader
schema_salad.metaschema.typedsl_Record_nameLoader_2
schema_salad.metaschema.union_of_None_type_or_strtype
schema_salad.metaschema.uri_union_of_None_type_or_strtype_True_False_None_None
schema_salad.metaschema.uri_array_of_strtype_True_False_None_None
schema_salad.metaschema.Enum_nameLoader
schema_salad.metaschema.typedsl_Enum_nameLoader_2
schema_salad.metaschema.
uri_union_of_PrimitiveTypeLoader_or_RecordSchemaLoader_or_EnumSchemaLoader_or_ArraySchemaLoader_or_MapS
schema_salad.metaschema.Array_nameLoader
schema_salad.metaschema.typedsl_Array_nameLoader_2
schema_salad.metaschema.Map_nameLoader
schema_salad.metaschema.typedsl_Map_nameLoader_2
schema_salad.metaschema.Union_nameLoader
schema_salad.metaschema.typedsl_Union_nameLoader_2
schema_salad.metaschema.union_of_None_type_or_booltype
schema_salad.metaschema.union_of_None_type_or_inttype
schema_salad.metaschema.uri_strtype_False_False_1_None
schema_salad.metaschema.uri_union_of_None_type_or_strtype_False_False_None_None
schema_salad.metaschema.
uri_union_of_None_type_or_strtype_or_array_of_strtype_False_False_None_None
schema_salad.metaschema.union_of_None_type_or_strtype_or_JsonldPredicateLoader
schema_salad.metaschema.union_of_None_type_or_Any_type
schema_salad.metaschema.array_of_SaladRecordFieldLoader
schema_salad.metaschema.union_of_None_type_or_array_of_SaladRecordFieldLoader
schema_salad.metaschema.
idmap_fields_union_of_None_type_or_array_of_SaladRecordFieldLoader
schema_salad.metaschema.
uri_union_of_None_type_or_strtype_or_array_of_strtype_False_False_1_None
schema_salad.metaschema.array_of_SpecializeDefLoader

`schema_salad.metaschema.union_of_None_type_or_array_of_SpecializeDefLoader`

`schema_salad.metaschema.`

`idmap_specialize_union_of_None_type_or_array_of_SpecializeDefLoader`

`schema_salad.metaschema.Documentation_nameLoader`

`schema_salad.metaschema.typedsl_Documentation_nameLoader_2`

`schema_salad.metaschema.`

`union_of_SaladRecordSchemaLoader_or_SaladEnumSchemaLoader_or_SaladMapSchemaLoader_or_SaladUnionSchemaLo`

`schema_salad.metaschema.`

`array_of_union_of_SaladRecordSchemaLoader_or_SaladEnumSchemaLoader_or_SaladMapSchemaLoader_or_SaladUnion`

`schema_salad.metaschema.`

`union_of_SaladRecordSchemaLoader_or_SaladEnumSchemaLoader_or_SaladMapSchemaLoader_or_SaladUnionSchemaLo`

`schema_salad.metaschema.load_document(doc, baseuri=None, loadingOptions=None)`

Parameters

- **doc** (*Any*) –
- **baseuri** (*Optional* [*str*]) –
- **loadingOptions** (*Optional* [*LoadingOptions*]) –

Return type

Any

`schema_salad.metaschema.load_document_with_metadata(doc, baseuri=None, loadingOptions=None, addl_metadata_fields=None)`

Parameters

- **doc** (*Any*) –
- **baseuri** (*Optional* [*str*]) –
- **loadingOptions** (*Optional* [*LoadingOptions*]) –
- **addl_metadata_fields** (*Optional* [*MutableSequence* [*str*]]) –

Return type

Any

`schema_salad.metaschema.load_document_by_string(string, uri, loadingOptions=None)`

Parameters

- **string** (*Any*) –
- **uri** (*str*) –
- **loadingOptions** (*Optional* [*LoadingOptions*]) –

Return type

Any

`schema_salad.metaschema.load_document_by_yaml(yaml, uri, loadingOptions=None)`

Shortcut to load via a YAML object. `yaml`: must be from `ruamel.yaml.main.YAML.load` with `preserve_quotes=True`

Parameters

- **yaml** (*Any*) –
- **uri** (*str*) –
- **loadingOptions** (*Optional*[*LoadingOptions*]) –

Return type

Any

schema_salad.python_codegen

Python code generator for a given schema salad definition.

Module Contents**Classes**

| | |
|----------------------|----------------------------------------------------------------|
| <i>PythonCodeGen</i> | Generation of Python code for a given Schema Salad definition. |
|----------------------|----------------------------------------------------------------|

Functions

| | |
|---------------------------|-----------------------------------|
| <i>fmt</i> (text, indent) | Use black to format this snippet. |
|---------------------------|-----------------------------------|

Attributes

| |
|--------------|
| <i>black</i> |
| <i>prims</i> |

schema_salad.python_codegen.**black**

schema_salad.python_codegen.**prims**

schema_salad.python_codegen.**fmt**(text, indent)

Use black to format this snippet.

:param indent the indent level for the current context

Parameters

- **text** (*str*) –
- **indent** (*int*) –

Return type

str

class `schema_salad.python_codegen.PythonCodeGen`(*out*, *copyright*, *parser_info*, *salad_version*)

Bases: `schema_salad.codegen_base.CodeGenBase`

Generation of Python code for a given Schema Salad definition.

Parameters

- **out** (*IO*[*str*]) –
- **copyright** (*Optional*[*str*]) –
- **parser_info** (*str*) –
- **salad_version** (*str*) –

static `safe_name`(*name*)

Generate a safe version of the given name.

Parameters

- name** (*str*) –

Return type

str

`prologue`()

Trigger to generate the prologue code.

Return type

None

begin_class(*classname*, *extends*, *doc*, *abstract*, *field_names*, *idfield*, *optional_fields*)

Produce the header for the given class.

Parameters

- **classname** (*str*) –
- **extends** (*MutableSequence*[*str*]) –
- **doc** (*str*) –
- **abstract** (*bool*) –
- **field_names** (*MutableSequence*[*str*]) –
- **idfield** (*str*) –
- **optional_fields** (*Set*[*str*]) –

Return type

None

end_class(*classname*, *field_names*)

Signal that we are done with this class.

Parameters

- **classname** (*str*) –
- **field_names** (*List*[*str*]) –

Return type

None

type_loader(*type_declaration*, *container*=None, *no_link_check*=None)

Parse the given type declaration and declare its components.

Parameters

- **type_declaration** (Union[List[Any], Dict[str, Any], str]) –
- **container** (Optional[str]) –
- **no_link_check** (Optional[bool]) –

Return type

schema_salad.codegen_base.TypeDef

declare_id_field(*name*, *fieldtype*, *doc*, *optional*)

Output the code to handle the given ID field.

Parameters

- **name** (str) –
- **fieldtype** (*schema_salad.codegen_base.TypeDef*) –
- **doc** (Optional[str]) –
- **optional** (bool) –

Return type

None

declare_field(*name*, *fieldtype*, *doc*, *optional*, *subscope*)

Output the code to load the given field.

Parameters

- **name** (str) –
- **fieldtype** (*schema_salad.codegen_base.TypeDef*) –
- **doc** (Optional[str]) –
- **optional** (bool) –
- **subscope** (Optional[str]) –

Return type

None

uri_loader(*inner*, *scoped_id*, *vocab_term*, *ref_scope*, *no_link_check*=None)

Construct the TypeDef for the given URI loader.

Parameters

- **inner** (*schema_salad.codegen_base.TypeDef*) –
- **scoped_id** (bool) –
- **vocab_term** (bool) –
- **ref_scope** (Optional[int]) –
- **no_link_check** (Optional[bool]) –

Return type

schema_salad.codegen_base.TypeDef

idmap_loader(*field*, *inner*, *map_subject*, *map_predicate*)

Construct the TypeDef for the given mapped ID loader.

Parameters

- **field** (*str*) –
- **inner** (*schema_salad.codegen_base.TypeDef*) –
- **map_subject** (*str*) –
- **map_predicate** (*Optional[str]*) –

Return type

schema_salad.codegen_base.TypeDef

typedsl_loader(*inner*, *ref_scope*)

Construct the TypeDef for the given DSL loader.

Parameters

- **inner** (*schema_salad.codegen_base.TypeDef*) –
- **ref_scope** (*Optional[int]*) –

Return type

schema_salad.codegen_base.TypeDef

secondaryfilesdsl_loader(*inner*)

Construct the TypeDef for secondary files.

Parameters

inner (*schema_salad.codegen_base.TypeDef*) –

Return type

schema_salad.codegen_base.TypeDef

epilogue(*root_loader*)

Trigger to generate the epilogue code.

Parameters

root_loader (*schema_salad.codegen_base.TypeDef*) –

Return type

None

schema_salad.python_codegen_support

Template code used by python_codegen.py.

Module Contents

Classes

LoadingOptions

Saveable

Mark classes than have a save() and fromDoc() function.

Functions

| | |
|--------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| <code>load_field(val, fieldtype, baseuri, loadingOptions[, lc])</code> | Load field. |
| <code>extract_type(val_type)</code> | Take a type of value, and extracts the value as a string. |
| <code>convert_typing(val_type)</code> | Normalize type names to schema-salad types. |
| <code>parse_errors(error_message)</code> | Parse error messages from several loaders into one error message. |
| <code>save(val[, top, base_url, relative_uris])</code> | |
| <code>save_with_metadata(val, valLoadingOpts[, top, ...])</code> | Save and set \$namespaces, \$schemas, \$base and any other metadata fields at the top level. |
| <code>expand_url(url, base_url, loadingOptions[, scoped_id, ...])</code> | |
| <code>file_uri(path[, split_frag])</code> | Transform a file path into a URL with file scheme. |
| <code>prefix_url(url, namespaces)</code> | Expand short forms into full URLs using the given namespace dictionary. |
| <code>save_relative_uri(uri, base_url, scoped_id, ref_scope, ...)</code> | Convert any URI to a relative one, obeying the scoping rules. |
| <code>shortname(inputid)</code> | Compute the shortname of a fully qualified identifier. |

Attributes

| |
|------------------------|
| <code>IdxType</code> |
| <code>save_type</code> |

`schema_salad.python_codegen_support.IdxType`

```
class schema_salad.python_codegen_support.LoadingOptions(fetcher=None, namespaces=None,
                                                         schemas=None, fileuri=None,
                                                         copyfrom=None, original_doc=None,
                                                         addl_metadata=None, baseuri=None,
                                                         idx=None, imports=None,
                                                         includes=None, no_link_check=None,
                                                         container=None)
```

Parameters

- **fetcher** (*Optional[schema_salad.fetcher.Fetcher]*) –
- **namespaces** (*Optional[Dict[str, str]]*) –
- **schemas** (*Optional[List[str]]*) –
- **fileuri** (*Optional[str]*) –
- **copyfrom** (*Optional[LoadingOptions]*) –
- **original_doc** (*Optional[Any]*) –
- **addl_metadata** (*Optional[Dict[str, str]]*) –

- **baseuri** (*Optional*[*str*]) –
- **idx** (*Optional*[*IdxType*]) –
- **imports** (*Optional*[*List*[*str*]]) –
- **includes** (*Optional*[*List*[*str*]]) –
- **no_link_check** (*Optional*[*bool*]) –
- **container** (*Optional*[*str*]) –

property graph: **rdflib.Graph**

Generate a merged rdflib.Graph from all entries in self.schemas.

Return type

rdflib.Graph

idx: **IdxType**

fileuri: **str** | **None**

baseuri: **str**

namespaces: **MutableMapping**[**str**, **str**]

schemas: **MutableSequence**[**str**]

original_doc: **Any** | **None**

addl_metadata: **MutableMapping**[**str**, **Any**]

fetcher: *schema_salad.fetcher.Fetcher*

vocab: **Dict**[**str**, **str**]

rvocab: **Dict**[**str**, **str**]

cache: *schema_salad.utils.CacheType*

imports: **List**[**str**]

includes: **List**[**str**]

no_link_check: **bool** | **None**

container: **str** | **None**

class *schema_salad.python_codegen_support.Saveable*

Bases: *abc.ABC*

Mark classes than have a *save()* and *fromDoc()* function.

abstract classmethod **fromDoc**(*_doc*, *baseuri*, *loadingOptions*, *docRoot=None*)

Construct this object from the result of *yaml.load()*.

Parameters

- **_doc** (*Any*) –
- **baseuri** (*str*) –
- **loadingOptions** (*LoadingOptions*) –

- **docRoot** (*Optional*[*str*]) –

Return type*Saveable*

abstract save(*top=False*, *base_url=""*, *relative_uris=True*)

Convert this object to a JSON/YAML friendly dictionary.

Parameters

- **top** (*bool*) –
- **base_url** (*str*) –
- **relative_uris** (*bool*) –

Return typeDict[*str*, Any]

schema_salad.python_codegen_support.**load_field**(*val*, *fieldtype*, *baseuri*, *loadingOptions*, *lc=None*)

Load field.

Parameters

- **val** (*Union*[*str*, Dict[*str*, *str*]]) –
- **fieldtype** (*_Loader*) –
- **baseuri** (*str*) –
- **loadingOptions** (*LoadingOptions*) –
- **lc** (*Optional*[List[*Any*]]) –

Return type

Any

schema_salad.python_codegen_support.**save_type**

schema_salad.python_codegen_support.**extract_type**(*val_type*)

Take a type of value, and extracts the value as a string.

Parameters

val_type (*Type*[*Any*]) –

Return type*str*

schema_salad.python_codegen_support.**convert_typing**(*val_type*)

Normalize type names to schema-salad types.

Parameters

val_type (*str*) –

Return type*str*

schema_salad.python_codegen_support.**parse_errors**(*error_message*)

Parse error messages from several loaders into one error message.

Parameters

error_message (*str*) –

Return typeTuple[*str*, *str*, *str*]

`schema_salad.python_codegen_support.save(val, top=True, base_url="", relative_uris=True)`

Parameters

- **val** (*Any*) –
- **top** (*bool*) –
- **base_url** (*str*) –
- **relative_uris** (*bool*) –

Return type

save_type

`schema_salad.python_codegen_support.save_with_metadata(val, valLoadingOpts, top=True, base_url="", relative_uris=True)`

Save and set \$namespaces, \$schemas, \$base and any other metadata fields at the top level.

Parameters

- **val** (*Any*) –
- **valLoadingOpts** (*LoadingOptions*) –
- **top** (*bool*) –
- **base_url** (*str*) –
- **relative_uris** (*bool*) –

Return type

save_type

`schema_salad.python_codegen_support.expand_url(url, base_url, loadingOptions, scoped_id=False, vocab_term=False, scoped_ref=None)`

Parameters

- **url** (*str*) –
- **base_url** (*str*) –
- **loadingOptions** (*LoadingOptions*) –
- **scoped_id** (*bool*) –
- **vocab_term** (*bool*) –
- **scoped_ref** (*Optional[int]*) –

Return type

str

`schema_salad.python_codegen_support.file_uri(path, split_frag=False)`

Transform a file path into a URL with file scheme.

Parameters

- **path** (*str*) –
- **split_frag** (*bool*) –

Return type

str

`schema_salad.python_codegen_support.prefix_url(url, namespaces)`

Expand short forms into full URLs using the given namespace dictionary.

Parameters

- **url** (*str*) –
- **namespaces** (*Dict[str, str]*) –

Return type

str

`schema_salad.python_codegen_support.save_relative_uri(uri, base_url, scoped_id, ref_scope, relative_uris)`

Convert any URI to a relative one, obeying the scoping rules.

Parameters

- **uri** (*Any*) –
- **base_url** (*str*) –
- **scoped_id** (*bool*) –
- **ref_scope** (*Optional[int]*) –
- **relative_uris** (*bool*) –

Return type

Any

`schema_salad.python_codegen_support.shortname(inputid)`

Compute the shortname of a fully qualified identifier.

See https://w3id.org/cwl/v1.2/SchemaSalad.html#Short_names.

Parameters

inputid (*str*) –

Return type

str

`schema_salad.ref_resolver`

Module Contents

Classes

| | |
|-----------------|-------------------------------------------------------------------|
| <i>NormDict</i> | A Dict where all keys are normalized using the provided function. |
| <i>Loader</i> | |

Functions

file_uri(path[, split_frag])

uri_file_path(url)

to_validation_exception(e)

Convert ruamel.yaml exception to our type.

SubLoader(loader)

schema_salad.ref_resolver.**file_uri**(path, split_frag=False)

Parameters

- **path** (*str*) –
- **split_frag** (*bool*) –

Return type

str

schema_salad.ref_resolver.**uri_file_path**(url)

Parameters

url (*str*) –

Return type

str

schema_salad.ref_resolver.**to_validation_exception**(e)

Convert ruamel.yaml exception to our type.

Parameters

e (*ruamel.yaml.error.MarkedYAMLError*) –

Return type

schema_salad.exceptions.ValidationException

class schema_salad.ref_resolver.**NormDict**(normalize=str)

Bases: Dict[*str*, Union[ruamel.yaml.comments.CommentMap, ruamel.yaml.comments.CommentSeq, *str*, None]]

A Dict where all keys are normalized using the provided function.

Parameters

normalize (*Callable[[str], str]*) –

__eq__(*other*)

Return self==value.

Parameters

other (*Any*) –

Return type

bool

__getitem__(*key*)

$x._\text{getitem}__(y) \iff x[y]$

Parameters

key (*Any*) –

Return type

Any

__setitem__(*key*, *value*)

Set self[*key*] to *value*.

Parameters

- **key** (*Any*) –
- **value** (*Any*) –

Return type

Any

__delitem__(*key*)

Delete self[*key*].

Parameters

key (*Any*) –

Return type

Any

__contains__(*key*)

True if the dictionary has the specified key, else False.

Parameters

key (*Any*) –

Return type

bool

__del__()

Return type

None

`schema_salad.ref_resolver.SubLoader(loader)`

Parameters

loader (*Loader*) –

Return type

Loader

```
class schema_salad.ref_resolver.Loader(ctx, schemagraph=None, foreign_properties=None, idx=None,
                                       cache=None, session=None, fetcher_constructor=None,
                                       skip_schemas=None, url_fields=None, allow_attachments=None,
                                       doc_cache=True, salad_version=None)
```

Parameters

- **ctx** (*schema_salad.utils.ContextType*) –
- **schemagraph** (*Optional[rdfliib.graph.Graph]*) –
- **foreign_properties** (*Optional[Set[str]]*) –

- **idx** (*Optional*[*schema_salad.utils.IdxType*]) –
- **cache** (*Optional*[*schema_salad.utils.CacheType*]) –
- **session** (*Optional*[*requests.sessions.Session*]) –
- **fetcher_constructor** (*Optional*[*schema_salad.utils.FetcherCallableType*]) –
- **skip_schemas** (*Optional*[*bool*]) –
- **url_fields** (*Optional*[*Set*[*str*]]) –
- **allow_attachments** (*Optional*[*schema_salad.utils.AttachmentsType*]) –
- **doc_cache** (*Union*[*str*, *bool*]) –
- **salad_version** (*Optional*[*str*]) –

expand_url(*url*, *base_url*, *scoped_id=False*, *vocab_term=False*, *scoped_ref=None*)

Parameters

- **url** (*str*) –
- **base_url** (*str*) –
- **scoped_id** (*bool*) –
- **vocab_term** (*bool*) –
- **scoped_ref** (*Optional*[*int*]) –

Return type

str

add_namespaces(*ns*)

Parameters

- **ns** (*Dict*[*str*, *str*]) –

Return type

None

add_schemas(*ns*, *base_url*)

Parameters

- **ns** (*Union*[*List*[*str*], *str*]) –
- **base_url** (*str*) –

Return type

None

add_context(*newcontext*)

Parameters

- **newcontext** (*schema_salad.utils.ContextType*) –

Return type

None

resolve_ref(*ref*, *base_url=None*, *checklinks=True*, *strict_foreign_properties=False*, *content_types=None*)

Parameters

- **ref** (*schema_salad.utils.ResolveType*) –

- **base_url** (*Optional*[*str*]) –
- **checklinks** (*bool*) –
- **strict_foreign_properties** (*bool*) –
- **content_types** (*Optional*[*List*[*str*]]) –

Return type

`schema_salad.utils.ResolvedRefType`

resolve_all(*document*, *base_url*, *file_base*=None, *checklinks*=True, *strict_foreign_properties*=False)

Parameters

- **document** (`schema_salad.utils.ResolveType`) –
- **base_url** (*str*) –
- **file_base** (*Optional*[*str*]) –
- **checklinks** (*bool*) –
- **strict_foreign_properties** (*bool*) –

Return type

`schema_salad.utils.ResolvedRefType`

fetch(*url*, *inject_ids*=True, *content_types*=None)

Parameters

- **url** (*str*) –
- **inject_ids** (*bool*) –
- **content_types** (*Optional*[*List*[*str*]]) –

Return type

`schema_salad.utils.IdxResultType`

validate_scoped(*field*, *link*, *docid*)

Parameters

- **field** (*str*) –
- **link** (*str*) –
- **docid** (*str*) –

Return type

str

validate_link(*field*, *link*, *docid*, *all_doc_ids*)

Parameters

- **field** (*str*) –
- **link** (*Union*[*str*, `ruamel.yaml.comments.CommentatedSeq`, `ruamel.yaml.comments.CommentatedMap`]) –
- **docid** (*str*) –
- **all_doc_ids** (*Dict*[*str*, *str*]) –

Return type

`Union`[*str*, `ruamel.yaml.comments.CommentatedSeq`, `ruamel.yaml.comments.CommentatedMap`]

getid(*d*)

Parameters

d (*Any*) –

Return type

Optional[*str*]

validate_links(*document*, *base_url*, *all_doc_ids*, *strict_foreign_properties=False*)

Parameters

- **document** (*schema_salad.utils.ResolveType*) –
- **base_url** (*str*) –
- **all_doc_ids** (*Dict[str, str]*) –
- **strict_foreign_properties** (*bool*) –

Return type

None

schema_salad.schema

Functions to process Schema Salad schemas.

Module Contents

Functions

| | |
|-------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| <code>get_metaschema()</code> | Instantiate the metaschema. |
| <code>add_namespaces(metadata, namespaces)</code> | Collect the provided namespaces, checking for conflicts. |
| <code>collect_namespaces(metadata)</code> | Walk through the metadata object, collecting namespace declarations. |
| <code>load_schema(schema_ref[, cache])</code> | Load a schema that can be used to validate documents using <code>load_and_validate</code> . |
| <code>load_and_validate(document_loader, avsc_names, ...[, ...])</code> | Load a document and validate it with the provided schema. |
| <code>validate_doc(schema_names, doc, loader, strict[, ...])</code> | Validate a document using the provided schema. |
| <code>get_anon_name(rec)</code> | Calculate a reproducible name for anonymous types. |
| <code>replace_type(items, spec, loader, found[, ...])</code> | Go through and replace types in the 'spec' mapping. |
| <code>avro_field_name(url)</code> | Turn a URL into an Avro-safe name. |
| <code>make_valid_avro(items, alltypes, found[, union, ...])</code> | Convert our schema to be more avro like. |
| <code>deepcopy_strip(item)</code> | Make a deep copy of list and dict objects. |
| <code>extend_and_specialize(items, loader)</code> | Apply 'extend' and 'specialize' to fully materialize derived record types. |
| <code>make_avro(i, loader[, metaschema_vocab])</code> | |
| <code>make_avro_schema(i, loader[, metaschema_vocab])</code> | All in one convenience function. |
| <code>make_avro_schema_from_avro(avro)</code> | |
| <code>shortname(inputid)</code> | Return the last segment of the provided fragment or path. |
| <code>print_inheritance(doc, stream)</code> | Write a Grapviz inheritance graph for the supplied document. |
| <code>print_fieldrefs(doc, loader, stream)</code> | Write a GraphViz graph of the relationships between the fields. |

Attributes

| |
|--------------------------------|
| <code>SALAD_FILES</code> |
| <code>saladp</code> |
| <code>cached_metaschema</code> |
| <code>schema_type</code> |
| <code>Avro</code> |

```
schema_salad.schema.SALAD_FILES = ('metaschema.yml', 'metaschema_base.yml', 'salad.md',
'field_name.yml', 'import_include.md',...
```

```
schema_salad.schema.saladp = 'https://w3id.org/cwl/salad#'
```

```
schema_salad.schema.cached_metaschema: Tuple[schema_salad.avro.schema.Names,
List[Dict[str, str]], schema_salad.ref_resolver.Loader] | None
```

`schema_salad.schema.get_metaschema()`

Instantiate the metaschema.

Return type

Tuple[*schema_salad.avro.schema.Names*, List[Dict[str, str]],
schema_salad.ref_resolver.Loader]

`schema_salad.schema.add_namespaces(metadata, namespaces)`

Collect the provided namespaces, checking for conflicts.

Parameters

- **metadata** (*Mapping*[str, Any]) –
- **namespaces** (*MutableMapping*[str, str]) –

Return type

None

`schema_salad.schema.collect_namespaces(metadata)`

Walk through the metadata object, collecting namespace declarations.

Parameters

metadata (*Mapping*[str, Any]) –

Return type

Dict[str, str]

`schema_salad.schema.schema_type`

`schema_salad.schema.load_schema(schema_ref, cache=None)`

Load a schema that can be used to validate documents using `load_and_validate`.

Returns

document_loader, avsc_names, schema_metadata, metaschema_loader

Parameters

- **schema_ref** (*schema_salad.utils.ResolveType*) –
- **cache** (*Optional*[*schema_salad.utils.CacheType*]) –

Return type

schema_type

`schema_salad.schema.load_and_validate(document_loader, avsc_names, document, strict, strict_foreign_properties=False)`

Load a document and validate it with the provided schema.

return data, metadata

Parameters

- **document_loader** (*schema_salad.ref_resolver.Loader*) –
- **avsc_names** (*schema_salad.avro.schema.Names*) –
- **document** (*Union*[*ruamel.yaml.comments.CommentMap*, str]) –
- **strict** (*bool*) –
- **strict_foreign_properties** (*bool*) –

Return type

Tuple[Any, Dict[str, Any]]

`schema_salad.schema.validate_doc(schema_names, doc, loader, strict, strict_foreign_properties=False)`

Validate a document using the provided schema.

Parameters

- **schema_names** (`schema_salad.avro.schema.Names`) –
- **doc** (`schema_salad.utils.ResolveType`) –
- **loader** (`schema_salad.ref_resolver.Loader`) –
- **strict** (`bool`) –
- **strict_foreign_properties** (`bool`) –

Return type

None

`schema_salad.schema.get_anon_name(rec)`

Calculate a reproducible name for anonymous types.

Parameters

rec (`MutableMapping[str, Union[str, Dict[str, str], List[str]]]`) –

Return type

`str`

`schema_salad.schema.replace_type(items, spec, loader, found, find_embeds=True, deepen=True)`

Go through and replace types in the ‘spec’ mapping.

Parameters

- **items** (`Any`) –
- **spec** (`Dict[str, Any]`) –
- **loader** (`schema_salad.ref_resolver.Loader`) –
- **found** (`Set[str]`) –
- **find_embeds** (`bool`) –
- **deepen** (`bool`) –

Return type

Any

`schema_salad.schema.avro_field_name(url)`

Turn a URL into an Avro-safe name.

If the URL has no fragment, return this plain URL.

Extract either the last part of the URL fragment past the slash, otherwise the whole fragment.

Parameters

url (`str`) –

Return type

`str`

`schema_salad.schema.Avro`

`schema_salad.schema.make_valid_avro(items, alltypes, found, union=False, fielddef=False, vocab=None)`

Convert our schema to be more avro like.

Parameters

- **items** (*Avro*) –
- **alltypes** (*Dict[str, Dict[str, Any]]*) –
- **found** (*Set[str]*) –
- **union** (*bool*) –
- **fielddef** (*bool*) –
- **vocab** (*Optional[Dict[str, str]]*) –

Return type

Union[Avro, MutableMapping[str, str], str, List[Union[Any, MutableMapping[str, str], str]]]

`schema_salad.schema.deepcopy_strip(item)`

Make a deep copy of list and dict objects.

Intentionally do not copy attributes. This is to discard CommentedMap and CommentedSeq metadata which is very expensive with regular copy.deepcopy.

Parameters

item (*Any*) –

Return type

Any

`schema_salad.schema.extend_and_specialize(items, loader)`

Apply ‘extend’ and ‘specialize’ to fully materialize derived record types.

Parameters

- **items** (*List[Dict[str, Any]]*) –
- **loader** (`schema_salad.ref_resolver.Loader`) –

Return type

List[Dict[str, Any]]

`schema_salad.schema.make_avro(i, loader, metaschema_vocab=None)`

Parameters

- **i** (*List[Dict[str, Any]]*) –
- **loader** (`schema_salad.ref_resolver.Loader`) –
- **metaschema_vocab** (*Optional[Dict[str, str]]*) –

Return type

List[Any]

`schema_salad.schema.make_avro_schema(i, loader, metaschema_vocab=None)`

All in one convenience function.

Call `make_avro()` and `make_avro_schema_from_avro()` separately if you need the intermediate result for diagnostic output.

Parameters

- **i** (*List[Any]*) –
- **loader** (`schema_salad.ref_resolver.Loader`) –
- **metaschema_vocab** (*Optional[Dict[str, str]]*) –

Return type*schema_salad.avro.schema.Names*`schema_salad.schema.make_avro_schema_from_avro(avro)`**Parameters**`avro` (*List*[*Union*[*Avro*, *Dict*[*str*, *str*], *str*]]) –**Return type***schema_salad.avro.schema.Names*`schema_salad.schema.shortname(inputid)`

Return the last segment of the provided fragment or path.

Parameters`inputid` (*str*) –**Return type***str*`schema_salad.schema.print_inheritance(doc, stream)`

Write a Grapviz inheritance graph for the supplied document.

Parameters

- `doc` (*List*[*Dict*[*str*, *Any*]]) –
- `stream` (*IO*[*Any*]) –

Return type

None

`schema_salad.schema.print_fieldrefs(doc, loader, stream)`

Write a GraphViz graph of the relationships between the fields.

Parameters

- `doc` (*List*[*Dict*[*str*, *Any*]]) –
- `loader` (`schema_salad.ref_resolver.Loader`) –
- `stream` (*IO*[*Any*]) –

Return type

None

`schema_salad.sourceline`**Module Contents****Classes***SourceLine*

Functions

rename(source)

add_lc_filename(r, source)

reflow_all(text[, maxline])

reflow(text, maxline[, shift])

indent(v[, nolead, shift, bullet])

bullets(textlist, bul)

strip_duplicated_lineno(text)

Strip duplicated line numbers.

strip_dup_lineno(text[, maxline])

cmap(d[, lc, fn])

Attributes

lineno_re

schema_salad.sourceline.lineno_re

schema_salad.sourceline.rename(*source*)

Parameters

source (*str*) –

Return type

str

schema_salad.sourceline.add_lc_filename(*r*, *source*)

Parameters

- **r** (*ruamel.yaml.comments.CommentedException*) –
- **source** (*str*) –

Return type

None

schema_salad.sourceline.reflow_all(*text*, *maxline*=None)

Parameters

- **text** (*str*) –
- **maxline** (*Optional[int]*) –

Return type`str``schema_salad.sourceline.reflow(text, maxline, shift="")`**Parameters**

- **text** (`str`) –
- **maxline** (`int`) –
- **shift** (`Optional[str]`) –

Return type`str``schema_salad.sourceline.indent(v, nolead=False, shift=' ', bullet=' ')`**Parameters**

- **v** (`str`) –
- **nolead** (`bool`) –
- **shift** (`str`) –
- **bullet** (`str`) –

Return type`str``schema_salad.sourceline.bullets(textlist, bul)`**Parameters**

- **textlist** (`List[str]`) –
- **bul** (`str`) –

Return type`str``schema_salad.sourceline.strip_duplicated_lineno(text)`

Strip duplicated line numbers.

Same as `strip_dup_lineno()` but without reflow.**Parameters****text** (`str`) –**Return type**`str``schema_salad.sourceline.strip_dup_lineno(text, maxline=None)`**Parameters**

- **text** (`str`) –
- **maxline** (`Optional[int]`) –

Return type`str`

`schema_salad.sourceline.cmap(d, lc=None, fn=None)`

Parameters

- **d** (`Union[int, float, str, MutableMapping[str, Any], MutableSequence[Any], None]`) –
- **lc** (`Optional[List[int]]`) –
- **fn** (`Optional[str]`) –

Return type

`Union[int, float, str, ruamel.yaml.comments.CommentMap, ruamel.yaml.comments.CommentSeq, None]`

class `schema_salad.sourceline.SourceLine`(*item*, *key=None*, *raise_type=str*, *include_traceback=False*)

Parameters

- **item** (*Any*) –
- **key** (`Optional[Any]`) –
- **raise_type** (`Callable[[str], Any]`) –
- **include_traceback** (*bool*) –

`__enter__()`

Return type

SourceLine

`__exit__(exc_type, exc_value, tb)`

Parameters

- **exc_type** (*Any*) –
- **exc_value** (*Any*) –
- **tb** (*Any*) –

Return type

`None`

`file()`

Return type

`Optional[str]`

`start()`

Return type

`Optional[Tuple[int, int]]`

`end()`

Return type

`Optional[Tuple[int, int]]`

`makeLead()`

Return type

str

makeError(*msg*)

Parameters

msg (*str*) –

Return type

Any

`schema_salad.typescript_codegen`

TypeScript code generator for a given schema salad definition.

Module Contents

Classes

| | |
|--------------------------|--------------------------------------------------------------------|
| <i>TypeScriptCodeGen</i> | Generation of TypeScript code for a given Schema Salad definition. |
|--------------------------|--------------------------------------------------------------------|

Functions

| | |
|------------------------------------------------|----------------------------------------------------------------|
| <i>doc_to_doc_string</i> (doc[, indent_level]) | Generate a documentation string from a schema salad doc field. |
|------------------------------------------------|----------------------------------------------------------------|

Attributes

| |
|--------------|
| <i>prims</i> |
|--------------|

`schema_salad.typescript_codegen.doc_to_doc_string(doc, indent_level=0)`

Generate a documentation string from a schema salad doc field.

Parameters

- **doc** (*Optional[str]*) –
- **indent_level** (*int*) –

Return type

str

`schema_salad.typescript_codegen.prims`

class `schema_salad.typescript_codegen.TypeScriptCodeGen`(*base, examples, target, package*)

Bases: `schema_salad.codegen_base.CodeGenBase`

Generation of TypeScript code for a given Schema Salad definition.

Parameters

- **base** (*str*) –
- **examples** (*Optional[str]*) –
- **target** (*Optional[str]*) –
- **package** (*str*) –

prologue()

Trigger to generate the prologue code.

Return type

None

static safe_name(name)

Generate a safe version of the given name.

Parameters

name (*str*) –

Return type

str

begin_class(classname, extends, doc, abstract, field_names, idfield, optional_fields)

Produce the header for the given class.

Parameters

- **classname** (*str*) –
- **extends** (*MutableSequence[str]*) –
- **doc** (*str*) –
- **abstract** (*bool*) –
- **field_names** (*MutableSequence[str]*) –
- **idfield** (*str*) –
- **optional_fields** (*Set[str]*) –

Return type

None

end_class(classname, field_names)

Signal that we are done with this class.

Parameters

- **classname** (*str*) –
- **field_names** (*List[str]*) –

Return type

None

type_loader(type_declaration, container=None, no_link_check=None)

Parse the given type declaration and declare its components.

Parameters

- **type_declaration** (*Union[List[Any], Dict[str, Any], str]*) –
- **container** (*Optional[str]*) –

- **no_link_check** (*Optional*[*bool*]) –

Return type

schema_salad.codegen_base.TypeDef

type_loader_enum(*type_declaration*)

Parameters

type_declaration (*Dict*[*str*, *Any*]) –

Return type

schema_salad.codegen_base.TypeDef

declare_field(*name*, *fieldtype*, *doc*, *optional*, *subscope*)

Output the code to load the given field.

Parameters

- **name** (*str*) –
- **fieldtype** (*schema_salad.codegen_base.TypeDef*) –
- **doc** (*Optional*[*str*]) –
- **optional** (*bool*) –
- **subscope** (*Optional*[*str*]) –

Return type

None

declare_id_field(*name*, *fieldtype*, *doc*, *optional*)

Output the code to handle the given ID field.

Parameters

- **name** (*str*) –
- **fieldtype** (*schema_salad.codegen_base.TypeDef*) –
- **doc** (*Optional*[*str*]) –
- **optional** (*bool*) –

Return type

None

to_typescript(*val*)

Convert a Python keyword to a TypeScript keyword.

Parameters

val (*Any*) –

Return type

Any

uri_loader(*inner*, *scoped_id*, *vocab_term*, *ref_scope*, *no_link_check=None*)

Construct the TypeDef for the given URI loader.

Parameters

- **inner** (*schema_salad.codegen_base.TypeDef*) –
- **scoped_id** (*bool*) –
- **vocab_term** (*bool*) –

- **ref_scope** (*Optional[int]*) –
- **no_link_check** (*Optional[bool]*) –

Return type*schema_salad.codegen_base.TypeDef***idmap_loader**(*field, inner, map_subject, map_predicate*)

Construct the TypeDef for the given mapped ID loader.

Parameters

- **field** (*str*) –
- **inner** (*schema_salad.codegen_base.TypeDef*) –
- **map_subject** (*str*) –
- **map_predicate** (*Optional[str]*) –

Return type*schema_salad.codegen_base.TypeDef***typedsl_loader**(*inner, ref_scope*)

Construct the TypeDef for the given DSL loader.

Parameters

- **inner** (*schema_salad.codegen_base.TypeDef*) –
- **ref_scope** (*Optional[int]*) –

Return type*schema_salad.codegen_base.TypeDef***epilogue**(*root_loader*)

Trigger to generate the epilogue code.

Parameters**root_loader** (*schema_salad.codegen_base.TypeDef*) –**Return type**

None

secondaryfilesdsl_loader(*inner*)

Construct the TypeDef for secondary files.

Parameters**inner** (*schema_salad.codegen_base.TypeDef*) –**Return type***schema_salad.codegen_base.TypeDef*

`schema_salad.utils`

`schema_salad.validate`

Module Contents

Functions

| | |
|----------------------------------------------------------------------|--------------------------------------------------------------------------------|
| <code>validate(expected_schema, datum[, identifiers, ...])</code> | |
| <code>avro_shortcode(name)</code> | Produce an avro friendly short name. |
| <code>avro_type_name(url)</code> | Turn a URL into an Avro-safe name. |
| <code>friendly(v)</code> | Format an Avro schema into a pretty-printed representation. |
| <code>vpformat(datum)</code> | Truncate a pretty-printed representation of a Python object to 160 characters. |
| <code>validate_ex(expected_schema, datum[, identifiers, ...])</code> | Determine if a python datum is an instance of a schema. |

Attributes

| |
|-----------------------------|
| <code>INT_MIN_VALUE</code> |
| <code>INT_MAX_VALUE</code> |
| <code>LONG_MIN_VALUE</code> |
| <code>LONG_MAX_VALUE</code> |
| <code>saladp</code> |
| <code>primitives</code> |

`schema_salad.validate.validate(expected_schema, datum, identifiers=None, strict=False, foreign_properties=None, vocab=None)`

Parameters

- **expected_schema** (`schema_salad.avro.schema.Schema`) –
- **datum** (*Any*) –
- **identifiers** (*Optional*[`List`[*str*]]) –
- **strict** (*bool*) –
- **foreign_properties** (*Optional*[`Set`[*str*]]) –
- **vocab** (*Optional*[`Mapping`[*str*, *str*]]) –

Return type

`bool`

`schema_salad.validate.INT_MIN_VALUE`

`schema_salad.validate.INT_MAX_VALUE`

`schema_salad.validate.LONG_MIN_VALUE`

`schema_salad.validate.LONG_MAX_VALUE`

`schema_salad.validate.avro_shortcode(name)`

Produce an avro friendly short name.

Parameters

name (*str*) –

Return type

`str`

`schema_salad.validate.saladp = 'https://w3id.org/cwl/salad#'`

`schema_salad.validate.primitives`

`schema_salad.validate.avro_type_name(url)`

Turn a URL into an Avro-safe name.

If the URL has no fragment, return this plain URL.

Extract either the last part of the URL fragment past the slash, otherwise the whole fragment.

Parameters

url (*str*) –

Return type

`str`

`schema_salad.validate.friendly(v)`

Format an Avro schema into a pretty-printed representation.

Parameters

v (*Any*) –

Return type

`Any`

`schema_salad.validate.vpformat(datum)`

Truncate a pretty-printed representation of a Python object to 160 characters.

Parameters

datum (*Any*) –

Return type

`str`

`schema_salad.validate.validate_ex(expected_schema, datum, identifiers=None, strict=False,
foreign_properties=None, raise_ex=True,
strict_foreign_properties=False, logger=_logger,
skip_foreign_properties=False, vocab=None)`

Determine if a python datum is an instance of a schema.

Parameters

- **expected_schema** (`schema_salad.avro.schema.Schema`) –
- **datum** (`Any`) –
- **identifiers** (`Optional[List[str]]`) –
- **strict** (`bool`) –
- **foreign_properties** (`Optional[Set[str]]`) –
- **raise_ex** (`bool`) –
- **strict_foreign_properties** (`bool`) –
- **logger** (`logging.Logger`) –
- **skip_foreign_properties** (`bool`) –
- **vocab** (`Optional[Mapping[str, str]]`) –

Return type

`bool`

Package Contents

```
schema_salad.__author__ = 'peter.amstutz@curoverse.com'
```

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