DoJSON Documentation

Release 1.2.0

Invenio collaboration

March 21, 2016
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DoJSON is a simple Pythonic JSON to JSON converter.
Installation

DoJSON is on PyPI so all you need is:

```
$ pip install dojson
```
Documentation

Documentation is readable at https://pythonhosted.org/dojson/ or it can be built using Sphinx:

```
$ pip install dojson[docs]
$ python setup.py build_sphinx
```
CHAPTER 4

Testing

Running the test suite is as simple as:

```
$ python setup.py test
```
A simple example on how to convert MARCXML to JSON:

```python
from dojson.contrib.marc21.utils import create_record, split_stream
from dojson.contrib.marc21 import marc21
[marc21.do(create_record(data)) for data in split_stream(open('/tmp/data.xml', 'r'))]
```

5.1 User’s Guide

This part of the documentation will show you how to get started in using DoJSON.

5.1.1 Usage

DoJSON is a simple Pythonic JSON to JSON converter.

The main goal of this package is to help with managing a set of rules for manipulation of Python dictionaries with focus on JSON serialization. Each rule is associated with regular expression and key. The regular expression has to match a key in the source mapping and produces a new value that is added to the output mapping under the new key.

Initialization

First create an `Overdo` object that is holding the index with rules.

```python
>>> import dojson
>>> simple = dojson.Overdo()
```

Next step is to create rules that will manipulate a source object.

```python
>>> @simple.over('first', '^.*st$')
... def first(self, key, value):
...     return value + 1
>>> @simple.over('second', '^.*nd$')
... def second(self, key, value):
...     return value + 2
```

And now we can try to match the source object and produce new data.

```python
>>> data = simple.do({'1st': 1, '2nd': 2})
>>> assert 2 == data['first']
>>> assert 4 == data['second']
```
Command line interface

Command line interface script is installed as dojson.

The easiest way to get started by applying already registered rule to a JSON data.

{"245__": {"a": "Test title"}}

DoJSON comes with set of rules for processing MARC21 fields.

$ echo '{"245__": {"a": "Test title"}}' | dojson do marc21
{"title_statement": {"title": "Test title"}}

Sometimes one can get input with fields that does not match any rule. To get such a list of fields one can use the missing command.

$ echo '{"999__": {"a": "Test title"}}' | dojson missing marc21
999__

The usual problem comes with reading different file formats such as XML.

```xml
<?xml version='1.0' encoding='UTF-8'?>
<collection xmlns="http://www.loc.gov/MARC21/slim">
  <record>
    <datafield tag="245" ind1=" " ind2=" ">
      <subfield code="a">Test title</subfield>
    </datafield>
  </record>
</collection>
```

You can specify registered loader using -l <NAME> argument. Save the above example as example.xml and check following command.

```bash
$ dojson -i example.xml -l marcxml do marc21
{"title_statement": {"title": "Test title"}}
```

In similar way it is possible to specify different output serializer (-d).

```bash
$ echo '{"title_statement": {"title": "Test title"}}' | dojson -d marcxml do marc21
<?xml version='1.0' encoding='UTF-8'?>
<collection xmlns="http://www.loc.gov/MARC21/slim">
  <record>
    <datafield tag="245" ind1=" " ind2=" ">
      <subfield code="a">Test title</subfield>
    </datafield>
  </record>
</collection>
```

Command chaining

This makes JSON manipulation even easier. For first example see schema command that accept string argument containing URL of JSON-Schema that should be added to $schema field.

```bash
$ dojson -i example.xml -l marcxml do marc21 \
   schema http://example.org/schema/marc21.json
..."schema": "http://example.org/schema/marc21.json"
```

Second example shows easy verification that rules produce an identity function.
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```bash
$ dojson -l marcxml -d marcxml do marc21 do to_marc21 < example.xml | \
    diff - example.xml
```

### Extensibility

New commands, loaders, dumpers, or rules can be provided via entry points.

- `dojson.cli` commands that return a processor accepting an iterator;
- `dojson.cli.load` functions expecting a stream and returning Python dict or iterator;
- `dojson.cli.dump` functions expecting a Python object and returning str;
- `dojson.cli.rule` instances of `dojson.overdo.Overdo` with loaded rules.

### 5.2 API Reference

If you are looking for information on a specific function, class or method, this part of the documentation is for you.

#### 5.2.1 API

Do JSON translation.

```python
class dojson.overdo.Index(rules=None, flags=0, branch_size=99)
    Index implementation based on build-in Python SRE module.

    query(key)
    Return data matching the key.

class dojson.overdo.Overdo(bases=None, entry_point_group=None)
    Translation index.

    build()
    Build.

    do(blob, ignore_missing=True, exception_handlers=None)
    Translate blob values and instantiate new model instance.
    Raises MissingRule when no rule matched and ignore_missing is False.

    Parameters
    - blob -- dict-like object on which the matching rules are going to be applied.
    - ignore_missing -- Set to False if you prefer to raise an exception MissingRule for the first key that it is not matching any rule.
    - exception_handlers -- Give custom exception handlers to take care of non-standard codes that are installation specific.

    New in version 1.0.0: ignore_missing allows to specify if the function should raise an exception.
    New in version 1.1.0: exception_handlers allows to set custom handlers for non-standard MARC codes.

    missing(blob)
    Return keys with missing rules.
```

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over (name, *source_tags)
  Register creator rule.

CLI

Define chainable commands for processing loaded data.

dojson.cli.command.process_do = <click.core.Command object>
  Process data using given rule.

dojson.cli.command.process_missing = <click.core.Command object>
  List fields with missing rules.

dojson.cli.command.process_schema = <click.core.Command object>
  Add $schema to an item.

Utility function to manage CLI entry points

dojson.cli.utils.open_entry_point (group_name)
  Open entry point.

dojson.cli.utils.with_plugins (group_name)
  Register external CLI commands.

Contrib

There are set of rules to manage translation from other formats.

MARC21

MARC standards based on www.loc.gov/marc/.

5.3 Additional Notes

Notes on how to contribute, legal information and changes are here for the interested.

5.3.1 Contributing

Bug reports, feature requests, and other contributions are welcome. If you find a demonstrable problem that is caused by the code of this library, please:

1. Search for already reported problems.
2. Check if the issue has been fixed or is still reproducible on the latest master branch.
3. Create an issue with a test case.

If you create a feature branch, you can run the tests to ensure everything is operating correctly:

```
$ python setup.py test
...
======= 31 passed, 23 skipped in 1.37 seconds ======
```
You can also test your feature branch using Docker:

```bash
$ docker-compose build
$ docker-compose run web python setup.py test
$ docker-compose run web python setup.py build_sphinx
$ docker-compose run web pep257 --match-dir='dojson'
```

## 5.3.2 Changes

### Version 1.2.0 (released 2016-03-21):

#### Incompatible changes

- Removes automatic wrapping to `<collection/>` for single record passed to `dumps_etree`.

#### Improved features

- Adds new argument to specify namespace prefix in generated MARCXML.

### Version 1.1.1 (released 2016-03-15):

#### Bug fixes

- Adds missing schemas for fields bd388, bd370, bd348, bd884.

### Version 1.1.0 (released 2016-03-10):

#### Incompatible changes

- Moves `–load` and `–dump` options to global group.

#### New features

- Adds `schema` command to enhance JSON with ‘$schema’ field. (#73)
- Adds rules and schemas for MARC 21 Format for Authority Data. (#7)
- Adds rules and schemas for MARC 21 Format for Holdings Data. (#21)
- Adds support for parsing `<leader/>` tag in MARCXML.
- Adds new parameter `exception_handlers` to `dojson.Overdo.do` and `dojson.contrib.to_marc21.model.Underdo.do`. It can be given to the translation process to deal with non-standard fields in a custom way (#26).
- Adds new utility `map_order` function to ease renaming of subfields.
Improved features

- Adds more detailed usage examples. (#117)
- Refactors CLI to allow commands chaining.
- Adds support preserving the order of subfields.

Bug fixes

- Fixes support for Python 3.5.1.

Version 1.0.0 (released 2016-01-14):

Incompatible changes

- Removes support for single key matching multiple rules. Please make your rules mutually exclusive!
- controlfields 00x are expected to be the element or a list of multiple elements.

New features

- Adds new keyword argument `ignore_missing` to `Overdo.do` method to specify if method should raise `MissingRule` exception when there is no matching rule for a key.
- Adds new CLI option `–strict` to the `do` command that sets the `ignore_missing` argument to `False`. (#51)
- MARC XML serialization from to_marc21.

Improved features

- Adds support for Python 3+.
- Uses an OrderedDict to let the external tools working on `dict` (like `json`) behave correctly.
- All results from rules using `for_each_value` decoractor are being automatically extended. This is useful for repeatable MARC21 fields with different indicators. (#53)
- Record are stored in an immutable sorted structure which enables to keep the intended order while offering easy ways to access, index and manipulate.
- Adds two records to be tested.
- Reorders some of the assertion: `expected == actual`.

Version 0.4.0 (released 2015-11-18):

New features

- Improves `dojson.contrib.marc2.utils.load()` to read the input by iterating of the open stream, rather than loading it all in memory in one go. (#45) (#46)
- Renames `OverUndo` to `Underdo` following same name convention as for `Overdo`. 
Bug fixes

• Fixes indicator extraction from value in Underdo model.

Version 0.3.0 (released 2015-11-09):

New features

• Adds experimental rules for converting human readable JSON into a JSON representation of the MARC21 Format.
  • Adds do and missing commands for dojson command line interface (see dojson –help for more information).

Improved features

• Adds missing mapping for the first indicator of field 856.

Version 0.2.0 (released 2015-10-07):

New features

• Adds the possibility to use base DoJSON model so the rules are “inherited” from them.
  • Adds new decorator ignore_value that remove the key in the resulting json for None value.

Improved features

• Uses entry points instead of plain imports to load the creator rules.

Bug fixes

• Removes calls to PluginManager consider_setuptools_entrypoints() removed in PyTest 2.8.0.

Version 0.1.1 (released 2015-07-27):

• Sorts and removes duplicated enum values.
  • Swaps wrongly defined repeatable and non-repeatable subfields. (#23)
  • Addresses issue when allowed indicators where defined as a range. (#22)

Version 0.1.0 (released 2015-07-03):

• Initial public release.
5.3.3 License

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