

Report for Assignment 1 resit

Project chosen : flask-sqlalchemy

Name: Melih Şengül

URL: <https://github.com/melotelo/flask-sqlalchemy>

Number of lines of code and the tool used to count it: I have used lizard to count the lines and the languages were %100 python thus it was suitable to use lizard. The counting tool was run through the command **lizard** on the terminal.

Here were the results:

```
77 26 387 5 160 make_numbered_dir@1277-1436@.\.venv\Lib\site-packages\pytest\_py\path.py
79 19 317 2 84 pytest_runtest_logreport@540-623@.\.venv\Lib\site-packages\pytest\junitxml.py
55 16 362 5 57 wrap_session@272-328@.\.venv\Lib\site-packages\pytest\main.py
29 16 198 2 36 pytest_ignore_collect@392-427@.\.venv\Lib\site-packages\pytest\main.py
76 27 573 1 120 collect@841-960@.\.venv\Lib\site-packages\pytest\main.py
102 18 418 8 124 import_path@493-616@.\.venv\Lib\site-packages\pytest\pathlib.py
158 22 547 15 182 parametrize@1135-1316@.\.venv\Lib\site-packages\pytest\python.py
64 20 428 2 67 pytest_runtest_logreport@578-644@.\.venv\Lib\site-packages\pytest\terminal.py
152 72 1303 1 186 get@90-275@.\.venv\Lib\site-packages\imagesize.py
92 29 623 1 106 getDPI@278-383@.\.venv\Lib\site-packages\imagesize.py
52 19 338 5 67 callit@453-519@.\.venv\Lib\site-packages\nodeenv.py
86 25 547 7 105 __new__@841-945@.\.venv\Lib\site-packages\typing_extensions.py
25 16 197 3 38 __check_generic@2655-2692@.\.venv\Lib\site-packages\typing_extensions.py
55 20 309 4 62 __new__@2826-2887@.\.venv\Lib\site-packages\typing_extensions.py

=====
Total nloc  Avg.NLOC  AvgCCN  Avg.token  Fun Cnt  Warning cnt  Fun Rt  nloc Rt
-----
910324      12.2      3.1      72.7      47118      1030      0.02      0.15
```

Total nloc was 910324, which is around 910.3 KLOC. Because there are so many lines I can't put all of them here, I can only put a few lines and the results.

Programming language: Python %100

flask-sqlalchemy (Public)

forked from pallets-eco/flask-sqlalchemy

main 2 Branches 37 Tags

Go to file Add file Code

This branch is up to date with pallets-eco/flask-sqlalchemy:main. Contribute Sync fork

davidism Bump certifi from 2024.2.2 to 2024.7.4 in /requirements (pallets-eco#...) d099628 - 2 days ago 1,123 Commits

- .github Bump the github-actions group with 2 updates last week
- artwork Committed new artwork 13 years ago
- docs update project files 3 months ago
- examples update examples to SQLAlchemy 2 style 10 months ago
- requirements-skip Bump Jinja2 from 3.1.3 to 3.1.4 in /requirements-skip 2 months ago
- requirements Bump certifi from 2024.2.2 to 2024.7.4 in /requirements 2 days ago
- src/flask_sqlalchemy update project files 3 months ago
- tests update project files 3 months ago
- .editorconfig update project files 3 months ago
- .gitignore update project files 3 months ago
- .pre-commit-config.yaml [pre-commit.ci] pre-commit autoupdate last week
- .readthedocs.yaml update project files 3 months ago

About

Adds SQLAlchemy support to Flask

flask-sqlalchemy.palletsprojects.com

Readme BSD-3-Clause license Activity 0 stars 0 watching 0 forks

Releases

37 tags [Create a new release](#)

Packages

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Languages

Python 100.0%

As seen here too.

Coverage measurement with existing tool

The coverage tool that was used was coverage.py as the codes were written in python **coverage.py** was a suitable option.

First, I have installed coverage with **pip install coverage** on vscode windows terminal.

Then I ran **coverage run -m pytest tests -s** to get the coverage how much of the codes get covered by the tests.

```
===== test session starts =====
platform win32 -- Python 3.12.4, pytest-8.2.2, pluggy-1.5.0
rootdir: C:\Users\melot\Documents\GitHub\flask-sqlalchemy
configfile: pyproject.toml
plugins: anyio-3.7.1
collected 457 items

tests\test_cli.py .....
tests\test_engine.py .....
```

Then I ran **coverage report** to get the report.

Name	Stmts	Miss	Branch	BrPart	Cover
src\flask_sqlalchemy__init__.py	11	6	2	0	38%
src\flask_sqlalchemy\cli.py	8	0	0	0	100%
src\flask_sqlalchemy\extension.py	271	84	112	23	54%
src\flask_sqlalchemy\model.py	121	53	65	25	43%
src\flask_sqlalchemy\pagination.py	145	11	64	7	91%
src\flask_sqlalchemy\query.py	25	0	4	0	100%
src\flask_sqlalchemy\record_queries.py	46	3	14	3	90%
src\flask_sqlalchemy\session.py	49	11	26	9	68%
src\flask_sqlalchemy\table.py	13	2	9	7	59%
src\flask_sqlalchemy\track_modifications.py	52	8	22	9	77%
tests\conftest.py	50	0	24	0	100%
tests\conftest.py	50	0	24	0	100%
tests\test_cli.py	10	0	2	0	100%
tests\conftest.py	50	0	24	0	100%
tests\test_cli.py	10	0	2	0	100%
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tests\conftest.py	50	0	24	0	100%
tests\conftest.py	50	0	24	0	100%
tests\test_cli.py	10	0	2	0	100%
tests\test_engine.py	87	0	30	0	100%
tests\test_extension_object.py	48	0	12	0	100%
tests\test_extension_repr.py	38	0	8	0	100%
tests\test_legacy_query.py	85	1	28	1	98%
tests\test_metadata.py	123	0	26	0	100%
tests\test_model.py	194	2	58	2	98%
tests\test_model_bind.py	57	0	0	0	100%
tests\test_model_name.py	135	2	12	0	99%
tests\test_pagination.py	120	0	28	0	100%
tests\test_record_queries.py	33	6	6	2	79%
tests\test_session.py	129	0	26	0	100%
tests\test_table_bind.py	19	0	0	0	100%
tests\test_track_modifications.py	57	0	8	0	100%
tests\test_view_query.py	72	0	28	1	99%
TOTAL	1998	189	614	89	85%

Then I ran the command **coverage html** to get a better view which gave me a chance to look at a html document.

Coverage report: 85%

Files

Functions

Classes

coverage.py v7.5.3, created at 2024-07-07 23:44 +0300

File	statements	missing	excluded	branches	partial	coverage
src\flask_sqlalchemy\extension.py	271	84	0	112	23	54%
tests\test_model.py	194	2	0	58	2	98%
src\flask_sqlalchemy\pagination.py	145	11	0	64	7	91%
tests\test_model_name.py	135	2	0	12	0	99%
tests\test_session.py	129	0	0	26	0	100%
tests\test_metadata.py	123	0	0	26	0	100%
src\flask_sqlalchemy\model.py	121	53	0	65	25	43%
tests\test_pagination.py	120	0	0	28	0	100%
tests\test_engine.py	87	0	0	30	0	100%
tests\test_legacy_query.py	85	1	0	28	1	98%
tests\test_view_query.py	72	0	0	28	1	99%
tests\test_model_bind.py	57	0	0	0	0	100%
tests\test_track_modifications.py	57	0	0	8	0	100%
src\flask_sqlalchemy\track_modifications.py	52	8	0	22	9	77%
tests\conftest.py	50	0	0	24	0	100%
src\flask_sqlalchemy\session.py	49	11	0	26	9	68%
tests\test_extension_object.py	48	0	0	12	0	100%
src\flask_sqlalchemy\record_queries.py	46	3	0	14	3	90%
tests\test_extension_repr.py	38	0	0	8	0	100%
tests\test_record_queries.py	33	6	0	6	2	79%
src\flask_sqlalchemy\query.py	25	0	0	4	0	100%
tests\test_table_bind.py	19	0	0	0	0	100%
src\flask_sqlalchemy\table.py	13	2	0	9	7	59%
src\flask_sqlalchemy_init_.py	11	6	0	2	0	38%
tests\test_cli.py	10	0	0	2	0	100%
src\flask_sqlalchemy\cli.py	8	0	0	0	0	100%
Total	1998	189	0	614	89	85%

Here I identified the files that could be improved on coverage. I realized that with the functions view I could get a better look at which functions could be improved.


Coverage report: 85%

Files

Functions

Classes

coverage.py v7.5.3, created at 2024-07-07 23:44 +0300

filter... 

☐ hide covered

File	function	statements	missing	excluded	branches	partial	coverage
tests\test_track_modifications.py	test_track_modifications	43	0	0	6	0	100%
src\flask_sqlalchemy\pagination.py	(no function)	39	0	0	18	0	100%
tests\test_pagination.py	(no function)	38	0	0	14	0	100%
tests\test_session.py	test_get_bind_inheritance	37	0	0	4	0	100%
tests\test_model.py	(no function)	36	0	0	20	0	100%
tests\test_session.py	test_session_multiple_dbs	34	0	0	4	0	100%
tests\test_engine.py	(no function)	32	0	0	24	0	100%
tests\test_model.py	test_abstractmodel	31	0	0	4	0	100%
tests\test_extension_object.py	test_get_or_404_kwargs	30	0	0	8	0	100%
tests\test_model.py	test_mixinmodel	28	0	0	4	0	100%
src\flask_sqlalchemy\extension.py	SQLAlchemy__init__	25	0	0	10	0	100%
tests\test_metadata.py	(no function)	25	0	0	10	0	100%
tests\test_legacy_query.py	(no function)	24	0	0	14	0	100%
tests\test_model_name.py	(no function)	24	0	0	2	0	100%
src\flask_sqlalchemy\record_queries.py	(no function)	23	0	0	4	0	100%
tests\conftest.py	(no function)	22	0	0	10	0	100%
tests\test_metadata.py	test_reflect	22	0	0	0	0	100%
tests\test_metadata.py	test_create_drop_all	19	0	0	8	0	100%
src\flask_sqlalchemy\pagination.py	Pagination.__init__	18	0	0	4	0	100%
tests\test_session.py	(no function)	18	0	0	8	0	100%
tests\test_view_query.py	(no function)	18	0	0	10	0	100%
tests\conftest.py	Todo	16	0	0	8	0	100%
tests\test_legacy_query.py	test_custom_query_class	15	0	0	0	0	100%
tests\test_model_name.py	test_no_access_to_class_property	15	0	0	4	0	100%
tests\test_session.py	test_session_uses_bind_key	15	0	0	2	0	100%
tests\test_model_name.py	test_manual_name	14	0	0	0	0	100%

I identified the 2 functions in the file extension.py I could improve, the ones circled with red.

src\flask_sqlalchemy\extension.py	SQLAlchemy.get_or_404	4	1	0	2	0	50%
src\flask_sqlalchemy\extension.py	SQLAlchemy.first_or_404	4	1	0	2	0	50%
src\flask_sqlalchemy\extension.py	SQLAlchemy.relationship	2	1	0	0	0	50%
src\flask_sqlalchemy\extension.py	SQLAlchemy.dynamic_loader	2	1	0	0	0	50%
src\flask_sqlalchemy\model.py	camel_to_snake_case	2	1	0	0	0	50%
src\flask_sqlalchemy\extension.py	SQLAlchemy._make_metadata	8	3	0	4	2	42%
src\flask_sqlalchemy\model.py	(no function)	45	25	0	8	1	40%
src\flask_sqlalchemy\extension.py	SQLAlchemy._set_rel_query	6	2	0	4	0	40%
src\flask_sqlalchemy\model.py	should_set_tablename	9	4	0	9	5	39%
src\flask_sqlalchemy\extension.py	SQLAlchemy.init_app	42	19	0	26	3	35%
src\flask_sqlalchemy\extension.py	SQLAlchemy._apply_driver_defaults	22	9	0	18	5	35%
src\flask_sqlalchemy\extension.py	SQLAlchemy._call_for_binds	15	8	0	8	3	35%
src\flask_sqlalchemy\extension.py	SQLAlchemy._make_table_class.Table.__new__	4	2	0	2	0	33%
src\flask_sqlalchemy\extension.py	SQLAlchemy._relation	3	2	0	0	0	33%

Selected functions were these:

1.def _make_metadata(self, bind_key: str | None) -> sa.MetaData:

```

453 def _make_metadata(self, bind_key: str | None) -> sa.MetaData:
454     """Get or create a :class:`sqlalchemy.schema.MetaData` for the given bind key.
455
456     This method is used for internal setup. Its signature may change at any time.
457
458     :meta private:
459
460     :param bind_key: The name of the metadata being created.
461
462     .. versionadded:: 3.0
463     """
464     if bind_key in self._metadata:
465         return self._metadata[bind_key]
466     if bind_key is not None:
467         # Copy the naming convention from the default metadata.
468         naming_convention = self._make_metadata(None).naming_convention
469     else:
470         naming_convention = None
471
472     # Set the bind key in info to be used by session.get_bind.
473     metadata = sa.MetaData(
474         naming_convention=naming_convention, info={"bind_key": bind_key}
475     )
476     self._metadata[bind_key] = metadata
477     return metadata
478

```

2.def _set_rel_query(self, kwargs: dict[str, t.Any]) -> None:

```

def _set_rel_query(self, kwargs: dict[str, t.Any]) -> None:
    """Apply the extension's :attr:`Query` class as the default for relationships
    and backrefs.

    :meta private:
    """
    kwargs.setdefault("query_class", self.Query)

    if "backref" in kwargs:
        backref = kwargs["backref"]

    if isinstance(backref, str):
        backref = (backref, {})

    backref[1].setdefault("query_class", self.Query)

```

As we can see these function branches are not fully covered. Thus, I added certain changes to the extensions.py file to hold the flags for each branch while storing them inside a dictionary. I also created my own test file which would be used to cover the missing branches in both of the functions. Adding my own test file was necessary as none of the tests were covering these functions.

Coverage improvement

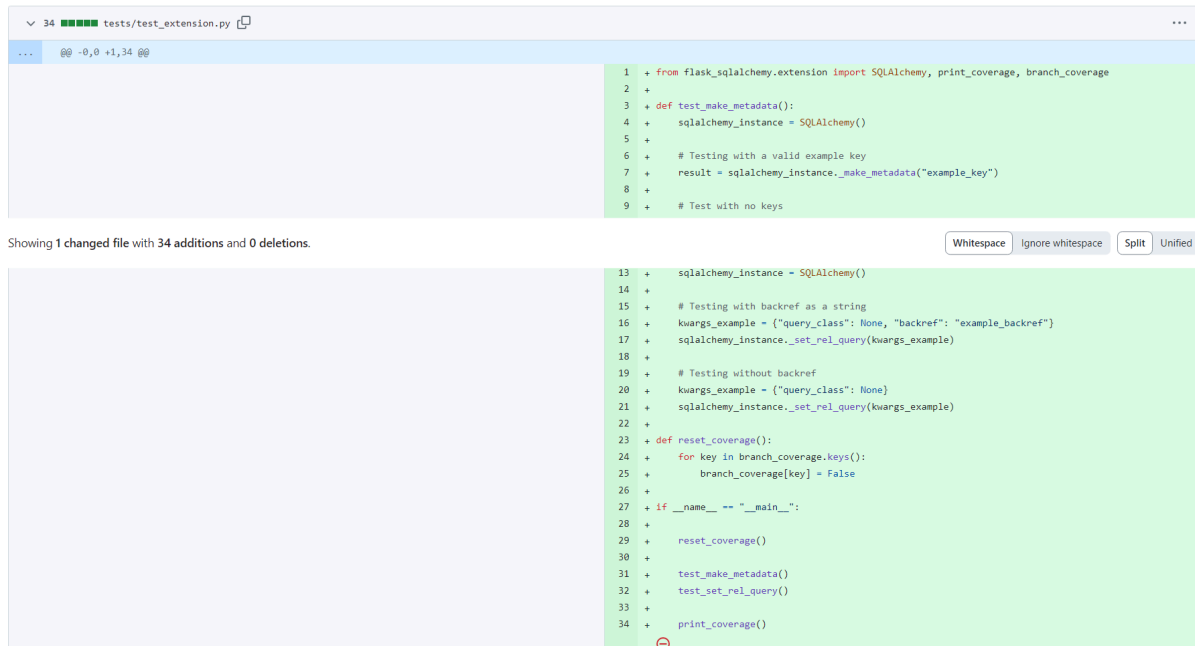
This is the screenshot of the changes on file extension.py which included the functions that were chosen. Here with the changes on the file my own coverage tool is created.

```
src/flask_sqlalchemy/extension.py

@@ -57,6 +57,13 @@ def _get_2x_declarative_bases(
57     if issubclass(b, (sa_orm.DeclarativeBase,
58         sa_orm.DeclarativeBaseNoMeta))
59 ]
60
61 class SQLAlchemy:
62     """Integrates SQLAlchemy with Flask. This handles setting up one or
63     more engines,
64
65     57     if issubclass(b, (sa_orm.DeclarativeBase,
66         sa_orm.DeclarativeBaseNoMeta))
67 ]
68
69 class SQLAlchemy:
70     """Integrates SQLAlchemy with Flask. This handles setting up one or
71     more engines,
72
73     60 + branch_coverage = {
74     61 +     "branch_1.1": False,
75     62 +     "branch_1.2": False,
76     63 +     "branch_1.3": False,
77     64 +     "branch_2.1": False,
78     65 +     "branch_2.2": False,
79     66 + }
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```

Individual tests

The test file **test_extension.py** that I created, includes tests for both of the functions and used for printing the coverage of the branches:



```
1 + from flask_sqlalchemy.extension import SQLAlchemy, print_coverage, branch_coverage
2 +
3 + def test_make_metadata():
4 +     sqlalchemy_instance = SQLAlchemy()
5 +
6 +     # Testing with a valid example key
7 +     result = sqlalchemy_instance._make_metadata("example_key")
8 +
9 +     # Test with no keys
10 +
11 +
12 +
13 + sqlalchemy_instance = SQLAlchemy()
14 +
15 + # Testing with backref as a string
16 + kwargs_example = {"query_class": None, "backref": "example_backref"}
17 + sqlalchemy_instance._set_rel_query(kwargs_example)
18 +
19 + # Testing without backref
20 + kwargs_example = {"query_class": None}
21 + sqlalchemy_instance._set_rel_query(kwargs_example)
22 +
23 + def reset_coverage():
24 +     for key in branch_coverage.keys():
25 +         branch_coverage[key] = False
26 +
27 + if __name__ == "__main__":
28 +
29 +     reset_coverage()
30 +
31 +     test_make_metadata()
32 +     test_set_rel_query()
33 +
34 +     print_coverage()
```

Link: [final · pallets-eco/flask-sqlalchemy@9cf5f7e \(github.com\)](https://github.com/pallets-eco/flask-sqlalchemy@9cf5f7e)

For improving coverage for Function 1(`def _make_metadata(self, bind_key: str | None) -> sa.MetaData:`):

I implemented **test_make_metadata:**

Which

- Creates an instance of SQLAlchemy.
- Calls `_make_metadata` with a valid key ("example_key") to ensure branch_1.1 and branch_1.2 are hit.
- Calls `_make_metadata` with None to ensure branch_1.3 is hit.

For improving coverage for Function 2(`def _set_rel_query(self, kwargs: dict[str, t.Any]) -> None:`):

I implemented **test_set_rel_query:**

Which

- Creates an instance of SQLAlchemy.
- Calls `_set_rel_query` with kwargs containing a backref as a string to ensure branch_2.1 and branch_2.2 are hit.
- Calls `_set_rel_query` with kwargs not containing a backref to ensure branch_2.1 is hit without hitting branch_2.2.

The **reset_coverage** function resets the branch_coverage dictionary before running tests to ensure accurate tracking for each test run.

The tests are executed by calling **test_make_metadata** and **test_set_rel_query**.

After running the tests, the **print_coverage** function prints the final coverage report of my own tool indicating which branches were hit.

To see if the implemented tests were successful the code was run and was successful. As seen on the following picture below.

```
PS C:\Users\melot\Documents\GitHub\flask-sqlalchemy\src> python -m flask_sqlalchemy.test_extension
branch_1.1 was hit
branch_1.2 was hit
branch_1.3 was hit
branch_2.1 was hit
branch_2.2 was hit
```

To see if it was also true in the coverage tool **coverage.py** the coverage tool was run again. Here are the changes from old coverage results to new coverage results:

Old Coverage Results :

src\flask_sqlalchemy\extension.py	SQLAlchemy.get_or_404	4	1	0	2	0	50%
src\flask_sqlalchemy\extension.py	SQLAlchemy.first_or_404	4	1	0	2	0	50%
src\flask_sqlalchemy\extension.py	SQLAlchemy.relationship	2	1	0	0	0	50%
src\flask_sqlalchemy\extension.py	SQLAlchemy.dynamic_loader	2	1	0	0	0	50%
src\flask_sqlalchemy\model.py	camel_to_snake_case	2	1	0	0	0	50%
src\flask_sqlalchemy\extension.py	SQLAlchemy._make_metadata	8	3	0	4	2	42%
src\flask_sqlalchemy\model.py	(no function)	45	25	0	8	1	40%
src\flask_sqlalchemy\extension.py	SQLAlchemy._set_rel_query	6	2	0	4	0	40%
src\flask_sqlalchemy\model.py	should_set_tablename	9	4	0	9	5	39%
src\flask_sqlalchemy\extension.py	SQLAlchemy.init_app	42	19	0	26	3	35%
src\flask_sqlalchemy\extension.py	SQLAlchemy.apply_driver_defaults	22	9	0	18	5	35%
src\flask_sqlalchemy\extension.py	SQLAlchemy.call_for_binds	15	8	0	8	3	35%
src\flask_sqlalchemy\extension.py	SQLAlchemy._make_table_class.Table.__new__	4	2	0	2	0	33%
src\flask_sqlalchemy\extension.py	SQLAlchemy._relation	3	2	0	0	0	33%

1.def _make_metadata(self, bind_key: str | None) -> sa.MetaData:

```
453 def _make_metadata(self, bind_key: str | None) -> sa.MetaData:
454     """Get or create a :class: 'sqlalchemy.schema.MetaData' for the given bind key.
455     This method is used for internal setup. Its signature may change at any time.
456
457     :meta private:
458
459     :param bind_key: The name of the metadata being created.
460
461     .. versionadded:: 3.0
462
463     if bind_key in self.metadata:
464         return self.metadata[bind_key]
465
466     if bind_key is not None:
467         # Copy the naming convention from the default metadata.
468         naming_convention = self._make_metadata(None).naming_convention
469     else:
470         naming_convention = None
471
472     # Set the bind key in info to be used by session.get_bind.
473     metadata = sa.MetaData(
474         naming_convention=naming_convention, info={"bind_key": bind_key}
475     )
476     self.metadata[bind_key] = metadata
477     return metadata
478
```


2.def _set_rel_query(self, kwargs: dict[str, t.Any]) -> None:

```
def _set_rel_query(self, kwargs: dict[str, t.Any]) -> None:
    """Apply the extension's :attr:`Query` class as the default for relationships
    and backrefs.

    :meta private:
    """
    kwargs.setdefault("query_class", self.Query)

    if "backref" in kwargs:
        backref = kwargs["backref"]

    if isinstance(backref, str):
        backref = (backref, {})

    backref[1].setdefault("query_class", self.Query)
```

New Coverage Results:

Coverage report: 94%

Files

Functions

Classes

extension

☐ hide covered

coverage.py v7.5.3, created at 2024-07-08 01:14 +0300

File	function	statements	missing	excluded	branches	partial	coverage
src/flask_sqlalchemy/extension.py	SQLAlchemy.teardown_session	1	0	0	0	0	100%
src/flask_sqlalchemy/extension.py	SQLAlchemy.set_rel_query	8	0	0	4	0	100%
src/flask_sqlalchemy/extension.py	SQLAlchemy.repr__	8	0	0	4	0	100%
src/flask_sqlalchemy/extension.py	SQLAlchemy.relationship	2	0	0	0	0	100%
src/flask_sqlalchemy/extension.py	SQLAlchemy.reflect	1	0	0	0	0	100%
src/flask_sqlalchemy/extension.py	SQLAlchemy.paginate	1	0	0	0	0	100%
src/flask_sqlalchemy/extension.py	SQLAlchemy.one_or_404	4	0	0	0	0	100%
src/flask_sqlalchemy/extension.py	SQLAlchemy.make_table_class.Table.__new__	4	0	0	2	0	100%
src/flask_sqlalchemy/extension.py	SQLAlchemy.metadata	1	0	0	0	0	100%
src/flask_sqlalchemy/extension.py	SQLAlchemy.make_table_class	3	0	0	0	0	100%
src/flask_sqlalchemy/extension.py	SQLAlchemy.make_session_factory	3	0	0	0	0	100%
src/flask_sqlalchemy/extension.py	SQLAlchemy.make_scoped_session	3	0	0	0	0	100%
src/flask_sqlalchemy/extension.py	SQLAlchemy.make_metadata	11	0	0	4	0	100%
src/flask_sqlalchemy/extension.py	SQLAlchemy.make_engine	1	0	0	0	0	100%
src/flask_sqlalchemy/extension.py	SQLAlchemy.make_declarative_base	23	0	0	12	0	100%
src/flask_sqlalchemy/extension.py	SQLAlchemy.__init__	25	0	0	10	0	100%
src/flask_sqlalchemy/extension.py	SQLAlchemy.get_or_404	4	0	0	2	0	100%
src/flask_sqlalchemy/extension.py	SQLAlchemy.get_2x_declarative_bases	1	0	0	0	0	100%
src/flask_sqlalchemy/extension.py	SQLAlchemy.first_or_404	4	0	0	2	0	100%
src/flask_sqlalchemy/extension.py	SQLAlchemy.engine	1	0	0	0	0	100%
src/flask_sqlalchemy/extension.py	SQLAlchemy.drop_all	1	0	0	0	0	100%

1.def _make_metadata(self, bind_key: str | None) -> sa.MetaData:

```
def _make_metadata(self, bind_key: str | None) -> sa.MetaData:
    """Get or create a :class:`sqlalchemy.schema.MetaData` for the given bind key.

    This method is used for internal setup. Its signature may change at any time.

    :meta private:

    :param bind_key: The name of the metadata being created.

    .. versionadded:: 3.0
    """
    if bind_key in self.metadata:
        branch_coverage["branch_1.1"] = True
        return self.metadata[bind_key]

    if bind_key is not None:
        # Copy the naming convention from the default metadata.
        branch_coverage["branch_1.2"] = True
        naming_convention = self._make_metadata(None).naming_convention
    else:
        branch_coverage["branch_1.3"] = True
        naming_convention = None

    # Set the bind key in info to be used by session.get_bind.
    metadata = sa.MetaData(
        naming_convention=naming_convention, info={"bind_key": bind_key}
    )
    self.metadata[bind_key] = metadata
    return metadata
```


2. `def _set_rel_query(self, kwargs: dict[str, t.Any]) -> None:`

```
949 def _set_rel_query(self, kwargs: dict[str, t.Any]) -> None:
950     """Apply the extension's :attr:`Query` class as the default for relationships
951     and backrefs.
952
953     :meta private:
954     """
955     kwargs.setdefault("query_class", self.Query)
956
957     if "backref" in kwargs:
958         branch_coverage["branch_2.1"] = True
959         backref = kwargs["backref"]
960
961         if isinstance(backref, str):
962             branch_coverage["branch_2.2"] = True
963             backref = (backref, {})
964
965         backref[1].setdefault("query_class", self.Query)
```

As it can be seen, the coverage of the functions were significantly improved.

Function `def _make_metadata(self, bind_key: str | None) -> sa.MetaData:` got improved from %42 to %100.

Function `def _set_rel_query(self, kwargs: dict[str, t.Any]) -> None:` got improved from %40 to %100.

This shows that added tests were successful for covering the missing branches.

- **branch_1.1:** Hit when `_make_metadata` is called with a key that exists in `self.metadata`.
- **branch_1.2:** Hit when `_make_metadata` is called with a non-None key that does not exist in `self.metadata`.
- **branch_1.3:** Hit when `_make_metadata` is called with None.
- **branch_2.1:** Hit when `_set_rel_query` is called with `kwargs` containing `backref`.
- **branch_2.2:** Hit when `_set_rel_query` is called with `kwargs` containing `backref` as a string.

Overall

Old Coverage Results:

Coverage report: 85%

Files

Functions

Classes

coverage.py v7.5.3, created at 2024-07-07 23:44 +0300

File	statements ▼	missing	excluded	branches	partial	coverage
src\flask_sqlalchemy\extension.py	271	84	0	112	23	54%
tests\test_model.py	194	2	0	58	2	98%
src\flask_sqlalchemy\pagination.py	145	11	0	64	7	91%
tests\test_model_name.py	135	2	0	12	0	99%
tests\test_session.py	129	0	0	26	0	100%
tests\test_metadata.py	123	0	0	26	0	100%
src\flask_sqlalchemy\model.py	121	53	0	65	25	43%
tests\test_pagination.py	120	0	0	28	0	100%
tests\test_engine.py	87	0	0	30	0	100%
tests\test_legacy_query.py	85	1	0	28	1	98%
tests\test_view_query.py	72	0	0	28	1	99%
tests\test_model_bind.py	57	0	0	0	0	100%
tests\test_track_modifications.py	57	0	0	8	0	100%
src\flask_sqlalchemy\track_modifications.py	52	8	0	22	9	77%
tests\conftest.py	50	0	0	24	0	100%
src\flask_sqlalchemy\session.py	49	11	0	26	9	68%
tests\test_extension_object.py	48	0	0	12	0	100%
src\flask_sqlalchemy\record_queries.py	46	3	0	14	3	90%
tests\test_extension_repr.py	38	0	0	8	0	100%
tests\test_record_queries.py	33	6	0	6	2	79%
src\flask_sqlalchemy\query.py	25	0	0	4	0	100%
tests\test_table_bind.py	19	0	0	0	0	100%
src\flask_sqlalchemy\table.py	13	2	0	9	7	59%
src\flask_sqlalchemy_init_.py	11	6	0	2	0	38%
tests\test_cli.py	10	0	0	2	0	100%
src\flask_sqlalchemy\cli.py	8	0	0	0	0	100%
Total	1998	189	0	614	89	85%

New Coverage Results:

Coverage report: 94%

Files

Functions

Classes

coverage.py v7.5.3, created at 2024-07-08 01:14 +0300

filter:

☐ hide covered

File	statements	missing	excluded	branches ▼	partial	coverage
src\flask_sqlalchemy\extension.py	280	25	0	114	13	88%
src\flask_sqlalchemy\model.py	121	3	0	65	5	96%
src\flask_sqlalchemy\pagination.py	145	11	0	64	7	91%
tests\test_model.py	194	2	0	58	2	98%
tests\test_engine.py	87	0	0	30	0	100%
tests\test_legacy_query.py	85	1	0	28	1	98%
tests\test_pagination.py	120	0	0	28	0	100%
tests\test_view_query.py	72	0	0	28	1	99%
src\flask_sqlalchemy\session.py	49	11	0	26	9	68%
tests\test_metadata.py	123	0	0	26	0	100%
tests\test_session.py	129	0	0	26	0	100%
tests\conftest.py	50	0	0	24	0	100%
src\flask_sqlalchemy\track_modifications.py	52	8	0	22	9	77%
src\flask_sqlalchemy\record_queries.py	46	3	0	14	3	90%
tests\test_extension_object.py	48	0	0	12	0	100%
tests\test_model_name.py	135	2	0	12	0	99%
src\flask_sqlalchemy\table.py	13	0	0	9	3	86%
tests\test_extension_repr.py	38	0	0	8	0	100%
tests\test_track_modifications.py	57	0	0	8	0	100%
tests\test_record_queries.py	33	6	0	6	2	79%
src\flask_sqlalchemy\query.py	25	0	0	4	0	100%
tests\test_extension.py	19	6	0	4	1	61%
src\flask_sqlalchemy_init_.py	11	6	0	2	0	38%
tests\test_cli.py	10	0	0	2	0	100%
src\flask_sqlalchemy\cli.py	8	0	0	0	0	100%
tests\test_model_bind.py	57	0	0	0	0	100%
tests\test_table_bind.py	19	0	0	0	0	100%
Total	2026	84	0	620	56	94%