
Practice REST API test automation with Python 3

Release 0.1

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REST_API_AUTOMATION

1.1 api package

1.1.1 Subpackages

`api.templates` package

Module contents

1.1.2 Submodules

1.1.3 `api.authentication_helper` module

Authentication Helper Class

```
class api.authentication_helper.AuthenticationHelper
    Bases: object
```

Authentication Helper Class. Contains helper methods for cars_app app

```
static authenticate_error (auth_flag)
    set auth message based on the authentication check result :param auth_flag: :return:
```

```
static check_auth (username, password, user_list)
    check if the given user is valid :param user_list: :param username: :param password: :return:
```

1.1.4 `api.cars_app` module

cars api is a sample web application developed by Qxf2 Services to help testers learn API automation. This REST application written in Python was built solely to help QA learn to write API automation. The application has endpoints for you to practice automating GET, POST, PUT and DELETE methods. It includes endpoints that use URL parameters, JSON payloads, returns different response codes, etc. We have also included permissioning and authentication too to help you write role based API tests.

IMPORTANT DISCLAIMER: The code here does not reflect Qxf2's coding standards and practices.

Source: <https://github.com/qxf2/cars-api>

```
api.cars_app.add_car ()
    this will help test POST without url params :return:
```

```
api.cars_app.delete_registered_cars ()
    this will help test delete :return:
```

```
api.cars_app.filter_cars(car_type)
    get cars of the given car type :param car_type: :return:

api.cars_app.get_car()
    this will help test GET with url params :return:

api.cars_app.get_car_details(name)
    this will help test GET with url params :param name: :return:

api.cars_app.get_cars()
    this will help test GET without url params :return:

api.cars_app.get_registered_cars()
    this will help test GET without url_params :return:

api.cars_app.get_user_list()
    return user list if the given authenticated user has admin permission :return:

api.cars_app.index_page()
    this will help test GET without url params :return:

api.cars_app.register_car()
    this will help test GET and POST with dynamic numbers in url :return:

api.cars_app.remove_car(name)
    this will help test DELETE :param name: :return:

api.cars_app.requires_auth(f)
    verify given user authentication details :param f: :return:

api.cars_app.requires_perm()
    check if the authenticated user has a admin permission :return:

api.cars_app.update_car(name)
    this will help test PUT :param name: :return:
```

1.1.5 Module contents

1.2 data package

1.2.1 Submodules

1.2.2 data.cars module

Cars Class

```
class data.cars.Cars
```

Bases: object

Contains cars list data

```
CARS_LIST = [{'brand': 'Maruti', 'car_type': 'hatchback', 'price_range': '3-5 lacs'}
```

```
get_cars()
```

Returns cars list data :return:

1.2.3 data.users module

Users Class

```
class data.users.Users
```

Bases: object

Contains Users data set

```
USER_LIST = [{'perm': 'admin', 'password': 'qxf2', 'name': 'qxf2'}, {'perm': 'non_
```

```
get_users()
```

Returns users list :return:

1.2.4 Module contents

1.3 tests package

1.3.1 Subpackages

tests.integration package

Submodules

tests.integration.post_cars_call_test module

POST Call Integration Test

```
class tests.integration.post_cars_call_test.PostCarsCallTestCase(methodName='runTest')
```

Bases: unittest.case.TestCase

Testing a JSON API implemented in Flask. POST Call Integration Test.

The POST method is used to request that the origin server accept the entity enclosed in the request as a new subordinate of the resource identified by the Request-URI in the Request-Line. It essentially means that POST request-URI should be of a collection URI.

POST is NOT idempotent. So if you retry the request N times, you will end up having N resources with N different URIs created on server.

Use POST when you want to add a child resource under resources collection.

```
setUp() → None
```

Hook method for setting up the test fixture before exercising it.

```
test_post_car_admin()
```

Test POST call using admin user credentials. :return:

```
test_post_car_non_admin()
```

Test POST call using non admin user credentials. :return:

tests.integration.post_register_call_test module

POST Call Integration Test

```
class tests.integration.post_register_call_test.PostCarRegistrationCallTestCase (methodName='runTest'):  
    Bases: unittest.case.TestCase
```

Testing a JSON API implemented in Flask. POST Call Integration Test.

The POST method is used to request that the origin server accept the entity enclosed in the request as a new subordinate of the resource identified by the Request-URI in the Request-Line. It essentially means that POST request-URI should be of a collection URI.

POST is NOT idempotent. So if you retry the request N times, you will end up having N resources with N different URIs created on server.

Use POST when you want to add a child resource under resources collection.

```
setUp () → None  
    Hook method for setting up the test fixture before exercising it.  
  
test_post_register_car_admin ()  
    Test POST (register car) call using admin user credentials. :return:  
  
test_post_register_car_non_admin ()  
    Test POST (register car) call using non admin user credentials. :return:
```

tests.integration.put_cars_call_test module

PUT Call Integration Test

```
class tests.integration.put_cars_call_test.PutCarsCallTestCase (methodName='runTest'):  
    Bases: unittest.case.TestCase
```

Testing a JSON API implemented in Flask. PUT Call Integration Test.

PUT method requests for the enclosed entity be stored under the supplied Request-URI. If the Request-URI refers to an already existing resource – an update operation will happen, otherwise create operation should happen if Request-URI is a valid resource URI (assuming client is allowed to determine resource identifier).

PUT method is idempotent. So if you send retry a request multiple times, that should be equivalent to single request modification.

Use PUT when you want to modify a singular resource which is already a part of resources collection. PUT replaces the resource in its entirety.

```
setUp () → None  
    Hook method for setting up the test fixture before exercising it.  
  
test_put_cars_update_admin ()  
    Test PUT call using admin user credentials. :return:  
  
test_put_cars_update_non_admin ()  
    Test PUT call using non admin user credentials. :return:
```

Module contents

tests.system package

Submodules

tests.system.base_test module

Base Test Case

```
class tests.system.base_test.BaseTestCase (methodName='runTest')
    Bases: unittest.case.TestCase

    classmethod setUpClass () → None
        1. Get Args from CLI
        2. Set Test URL
        3. Start REST API Service :return:

    classmethod tearDownClass () → None
        1. Stop REST API Service :return:
```

tests.system.delete_car_negative_test module

Flask App REST API testing: DELETE

```
class tests.system.delete_car_negative_test.DeleteCarNegativeTestCase (methodName='runTest')
    Bases: tests.system.base_test.BaseTestCase

    Simple Flask App Negative Test: DELETE call > cars

    setUp () → None
        Test data preparation :return:

    test_delete_car_wrong_admin_credentials ()
        Delete car using wrong admin user credentials. :return:

    test_delete_car_wrong_non_admin_credentials ()
        Get full list of cars using wrong non admin user credentials. :return:
```

tests.system.delete_car_positive_test module

Flask App REST API testing: DELETE

```
class tests.system.delete_car_positive_test.DeleteCarPositiveTestCase (methodName='runTest')
    Bases: tests.system.base_test.BaseTestCase

    Simple Flask App Positive Test: DELETE call > cars

    setUp () → None
        Test data preparation :return:

    tearDown () → None
        Hook method for deconstructing the test fixture after testing it.

    test_delete_car_admin ()
        Delete car using admin user credentials. :return:

    test_delete_car_non_admin ()
        Get full list of cars using non admin user credentials. :return:
```

tests.system.get_cars_negative_test module

Flask App REST API testing: GET

```
class tests.system.get_cars_negative_test.GetCarsNegativeTestCase (methodName='runTest')
    Bases: tests.system.base_test.BaseTestCase

    Simple Flask App Negative Test: GET call > cars

    setUp () → None
        Test data preparation :return:

    test_get_car_by_name_non_admin_swift_wrong_credentials ()
        Get car data by name = 'swift' using wrong non admin user credentials. :return:

    test_get_car_by_name_swift_empty_credentials ()
        Get car data by name = 'swift' using empty user credentials. :return:

    test_get_list_of_cars_admin_hatchback_wrong_credentials ()
        Get full list of cars from type = 'hatchback' using wrong admin user credentials. :return:

    test_get_list_of_cars_admin_wrong_credentials ()
        Get full list of cars using wrong admin user credentials. Wrong password + Correct username. Correct
        password + Wrong username. :return:

    test_get_list_of_cars_empty_credentials ()
        Get full list of cars using empty username/password. Empty password + Empty username. :return:

    test_get_list_of_cars_non_admin_sedan_wrong_credentials ()
        Get full list of cars of type = 'sedan' using wrong non admin user credentials. :return:

    test_get_list_of_cars_non_admin_wrong_credentials ()
        Get full list of cars using wrong non admin user credentials. Wrong password + Correct username. Correct
        password + Wrong username. :return:

    test_get_list_of_cars_sedan_empty_credentials ()
        Get full list of cars of type = 'sedan' using empty credentials. :return:
```

tests.system.get_cars_positive_test module

Flask App REST API testing: GET

```
class tests.system.get_cars_positive_test.GetCarsPositiveTestCase (methodName='runTest')
    Bases: tests.system.base_test.BaseTestCase

    Simple Flask App Positive Test: GET call > cars

    setUp () → None
        Test data preparation :return:

    test_get_car_by_name_non_admin_swift ()
        Get car data by name = 'swift' using non admin user credentials. :return:

    test_get_list_of_cars_admin ()
        Get full list of cars using admin user credentials. :return:

    test_get_list_of_cars_admin_hatchback ()
        Get full list of cars from type = 'hatchback' using admin user credentials. :return:

    test_get_list_of_cars_non_admin ()
        Get full list of cars using non admin user credentials. :return:
```

```
test_get_list_of_cars_non_admin_sedan ()  
    Get full list of cars of type = 'sedan' using non admin user credentials. :return:
```

tests.system.post_cars_negative_test module

Flask App REST API testing: POST

```
class tests.system.post_cars_negative_test.PostCarsPositiveTestCase (methodName='runTest')  
    Bases: tests.system.base_test.BaseTestCase  
    Simple Flask App Negative Test: POST call  
  
    setUp () → None  
        Test data preparation :return:  
  
    test_post_car_wrong_admin_credentials ()  
        Add new car using wrong admin user credentials. :return:  
  
    test_post_car_wrong_non_admin_credentials ()  
        Add new car using wrong non admin user credentials. :return:
```

tests.system.post_cars_positive_test module

Flask App REST API testing: POST

```
class tests.system.post_cars_positive_test.PostCarsPositiveTestCase (methodName='runTest')  
    Bases: tests.system.base_test.BaseTestCase  
    Simple Flask App Positive Test: POST call  
  
    setUp () → None  
        Test data preparation :return:  
  
    tearDown () → None  
        Post test procedure :return:  
  
    test_post_car_admin ()  
        Add new car using admin user credentials. :return:  
  
    test_post_car_non_admin ()  
        Add new car using non admin user credentials. :return:
```

tests.system.post_register_positive_test module

Flask App REST API testing: POST

```
class tests.system.post_register_positive_test.PostCarRegistrationPositiveTestCase (methodName='runTest')  
    Bases: tests.system.base_test.BaseTestCase  
    Simple Flask App Positive Test: POST call  
  
    setUp () → None  
        Test data preparation :return:  
  
    tearDown () → None  
        Post test procedure :return:  
  
    test_register_car_admin ()  
        Register car using admin user credentials. :return:
```

```
test_register_car_non_admin()  
    Register car using non admin user credentials. :return:
```

tests.system.put_cars_negative_test module

Flask App REST API testing: PUT

```
class tests.system.put_cars_negative_test.PutCarNegativeTestCase (methodName='runTest')  
    Bases: tests.system.base_test.BaseTestCase  
    Simple Flask App Negative Test: PUT call > cars  
  
    setUp() → None  
        Hook method for setting up the test fixture before exercising it.  
  
    test_put_update_car_admin_wrong_credentials()  
        Update car properties using wrong admin user credentials. :return:  
  
    test_put_update_car_non_admin_wrong_credentials()  
        Update car properties using wrong non admin user credentials. :return:
```

tests.system.put_cars_positive_test module

Flask App REST API testing: PUT

```
class tests.system.put_cars_positive_test.PutCarPositiveTestCase (methodName='runTest')  
    Bases: tests.system.base_test.BaseTestCase  
    Simple Flask App Positive Test: PUT call > cars  
  
    setUp() → None  
        Hook method for setting up the test fixture before exercising it.  
  
    tearDown() → None  
        Hook method for deconstructing the test fixture after testing it.  
  
    test_put_update_car_admin()  
        Update car properties using admin user credentials. :return:  
  
    test_put_update_car_non_admin()  
        Update car properties using non admin user credentials. :return:
```

Module contents

tests.unit package

Submodules

tests.unit.internal_func_negative_test module

Flask App REST API testing: Unit Tests

```
class tests.unit.internal_func_negative_test.InternalFuncNegativeTestCase (methodName='runTest')  
    Bases: unittest.case.TestCase  
  
    classmethod setUpClass() → None  
        Hook method for setting up class fixture before running tests in the class.
```

```
test_check_auth_wrong_admin()
test_check_auth_wrong_non_admin()
```

tests.unit.internal_func_positive_test module

Flask App REST API testing: Unit Tests

```
class tests.unit.internal_func_positive_test.InternalFuncPositiveTestCase (methodName='runTest')
    Bases: unittest.case.TestCase
```

```
classmethod setUpClass() → None
```

Hook method for setting up class fixture before running tests in the class.

```
test_authenticate_error_flag_false()
```

```
test_authenticate_error_flag_true()
```

```
test_check_auth_admin()
```

```
test_check_auth_non_admin()
```

```
test_debug_mode()
```

Whether debug mode is enabled.

When using flask run to start the development server, an interactive debugger will be shown for unhandled exceptions, and the server will be reloaded when code changes. The debug attribute maps to this config key. This is enabled when ENV is 'development' and is overridden by the FLASK_DEBUG environment variable. It may not behave as expected if set in code.

Do not enable debug mode when deploying in production.

Default: True if ENV is 'development', or False otherwise. :return:

Module contents

1.3.2 Module contents

1.4 utils package

1.4.1 Submodules

1.4.2 utils.get_args_from_cli module

Extract arguments from CLI

```
utils.get_args_from_cli.get_args()
```

Reads arguments from CLI and returns them as dictionary. Helps running Python unittest with command-line arguments. Raises Exception if one of the required arguments is missing. :return:

1.4.3 Module contents

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test_register_car_non_admin()
    (tests.system.post_register_positive_test.PostCarRegistrationPositiveTestCase
    method), 7

```