Creating an API test automation framework from scratch in Python can be a rewarding experience, and there are numerous resources available to help you along the way. Here's a collection of references, tutorials, books, and tools to guide you through building and mastering your Python-based API test automation framework.

### 1. \*\*Books\*\*

#### \*\*"Python Testing with pytest" by Brian Okken\*\*

- \*\*Description\*\*: This book is an excellent resource for anyone new to \*\*pytest\*\*, one of the most popular testing frameworks in Python. It walks you through writing effective tests using \*\*pytest\*\* and will help you create a solid foundation for API testing.

- \*\*Link\*\*: [Python Testing with pytest](https://pragprog.com/titles/bopytest/python-testing-with-pytest/)

#### \*\*"Test-Driven Development with Python" by Harry J.W. Percival\*\*

- \*\*Description\*\*: While this book focuses on \*\*Test-Driven Development\*\* (TDD) for web applications, it includes useful information about setting up test frameworks and testing HTTP APIs with Python. You'll get a deep dive into writing tests first and iterating based on those tests.

- \*\*Link\*\*: [Test-Driven Development with Python](https://www.obeythetestinggoat.com/)

#### \*\*"Python for Testers" by Ashwin Pajankar\*\*

- \*\*Description\*\*: This book focuses on Python programming specifically for testers and provides practical examples of automating API tests using Python libraries like \*\*requests\*\* and \*\*unittest\*\*.

- \*\*Link\*\*: [Python for Testers](https://www.amazon.com/Python-Testers-Automate-Testing-Development/dp/1788621753)

### 2. \*\*Online Tutorials\*\*

#### \*\*Real Python - API Testing with Python\*\*

- \*\*Description\*\*: Real Python is a trusted source for high-quality Python tutorials. This article teaches you how to test APIs in Python using the \*\*requests\*\* library, and how to structure your tests.

- \*\*Link\*\*: [API Testing with Python (Real Python)](https://realpython.com/python-api-testing/)

#### \*\*Test Automation University - Python Testing\*\*

- \*\*Description\*\*: Test Automation University offers free online courses, and one of the courses covers \*\*Python\*\* test automation. It includes sections on writing API tests in Python using libraries like \*\*requests\*\* and \*\*pytest\*\*.

- \*\*Link\*\*: [Test Automation University - Python Testing](https://testautomationu.applitools.com/python-tutorial/)

#### \*\*Python Requests Library Tutorial\*\*

- \*\*Description\*\*: A thorough tutorial on using the \*\*requests\*\* library to make API requests and handle responses. This is essential for anyone building an API test automation framework in Python.

- \*\*Link\*\*: [Python Requests Documentation](https://realpython.com/python-requests/)

#### \*\*Testing REST APIs with Python & Requests\*\*

- \*\*Description\*\*: This is a detailed tutorial on \*\*testing REST APIs\*\* using \*\*requests\*\* and \*\*pytest\*\*. It includes creating test cases for various HTTP methods, validating responses, and structuring tests.

- \*\*Link\*\*: [Testing REST APIs with Python](https://www.digitalocean.com/community/tutorials)

### 3. \*\*GitHub Repositories\*\*

#### \*\*Example API Test Automation Frameworks\*\*

- \*\*Description\*\*: Several open-source projects on GitHub can help you understand how to build an API test automation framework from scratch. You can study these projects, see how they’re structured, and contribute to them as you build your own framework.

- \*\*Link\*\*: [GitHub - Python API Testing Examples](https://github.com/topics/python-api-testing)

Some notable repositories:

- [PyRestTest](https://github.com/mkleehammer/pyresttest): A Python framework for REST API testing.

- [pytest API Testing Examples](https://github.com/pytest-dev/pytest): Example of \*\*pytest\*\* used for API testing.

- [requests](https://github.com/psf/requests): The official repository for the \*\*requests\*\* library.

### 4. \*\*YouTube Tutorials and Videos\*\*

#### \*\*API Testing with Python (YouTube)\*\*

- \*\*Description\*\*: There are several video tutorials on YouTube about API test automation using Python. These videos explain how to use \*\*requests\*\* and \*\*pytest\*\* in real-world testing scenarios.

- \*\*Link\*\*: [API Testing with Python (YouTube)](https://www.youtube.com/results?search\_query=api+testing+with+python)

#### \*\*Testing REST API with Requests and Pytest (YouTube)\*\*

- \*\*Description\*\*: This video goes through writing \*\*REST API tests\*\* in Python using the \*\*requests\*\* and \*\*pytest\*\* libraries, with explanations on test case structure, assertions, and how to handle JSON responses.

- \*\*Link\*\*: [Testing REST API with Requests and Pytest](https://www.youtube.com/watch?v=0p1R7n7El3E)

### 5. \*\*Python Libraries for API Testing\*\*

#### \*\*Requests Documentation\*\*

- \*\*Description\*\*: The \*\*requests\*\* library is essential for making API requests in Python. The official documentation provides examples and guides on making GET, POST, PUT, DELETE, etc. requests and handling responses.

- \*\*Link\*\*: [Requests Documentation](https://requests.readthedocs.io/en/latest/)

#### \*\*pytest Documentation\*\*

- \*\*Description\*\*: \*\*pytest\*\* is a framework for writing and running test cases in Python. It's easy to use and widely adopted for API testing. The official documentation will help you write structured tests, including assertions, fixtures, and running tests.

- \*\*Link\*\*: [pytest Documentation](https://docs.pytest.org/en/stable/)

#### \*\*Hypothesis (for Property-Based Testing)\*\*

- \*\*Description\*\*: \*\*Hypothesis\*\* is a property-based testing tool for Python that can help you generate test cases for your API testing automatically based on properties you specify.

- \*\*Link\*\*: [Hypothesis Documentation](https://hypothesis.readthedocs.io/en/latest/)

### 6. \*\*Other Tools and Resources\*\*

#### \*\*Postman (for Manual Testing)\*\*

- \*\*Description\*\*: Postman is a popular tool for testing APIs manually. While it’s not Python-based, it can help you understand API behavior before automating the tests with Python.

- \*\*Link\*\*: [Postman](https://www.postman.com/)

#### \*\*Swagger/OpenAPI (API Documentation)\*\*

- \*\*Description\*\*: \*\*Swagger\*\* (now known as \*\*OpenAPI\*\*) allows you to design, document, and test APIs. Many organizations use OpenAPI specifications to describe their APIs, and you can use tools like \*\*Swagger Codegen\*\* to generate test scripts in Python.

- \*\*Link\*\*: [Swagger/OpenAPI](https://swagger.io/)

#### \*\*Docker (for Test Automation)\*\*

- \*\*Description\*\*: \*\*Docker\*\* can be useful for running your API tests in isolated environments. You can containerize your API testing framework to run tests in multiple environments seamlessly.

- \*\*Link\*\*: [Docker](https://www.docker.com/)

### 7. \*\*CI/CD Integration\*\*

Once you’ve built the framework, you’ll likely want to integrate it with a \*\*Continuous Integration/Continuous Deployment\*\* (CI/CD) pipeline to automatically run tests when changes are made. Here are some resources:

- \*\*Jenkins Documentation\*\*: Set up Jenkins to automate running your tests.

- [Jenkins](https://www.jenkins.io/doc/)

- \*\*GitLab CI Documentation\*\*: Automate your tests using GitLab CI/CD pipelines.

- [GitLab CI](https://docs.gitlab.com/ee/ci/)

- \*\*GitHub Actions for Python Testing\*\*: Automate your testing on GitHub with GitHub Actions.

- [GitHub Actions](https://docs.github.com/en/actions)

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### 8. \*\*Key Concepts and Learning Topics\*\*

Here are some concepts and topics to master as you build your API test automation framework:

1. \*\*HTTP Methods\*\*: Understand how to use GET, POST, PUT, DELETE, PATCH, and OPTIONS requests for API interactions.

2. \*\*Status Codes\*\*: Learn how to validate HTTP status codes (e.g., 200, 404, 500) in your tests.

3. \*\*JSON Handling\*\*: Master how to handle and assert JSON responses in API tests.

4. \*\*Authentication\*\*: Understand different authentication mechanisms (e.g., Bearer tokens, OAuth).

5. \*\*Test Assertions\*\*: Learn how to use assertions to validate the responses returned by APIs.

6. \*\*Mocking\*\*: Learn how to mock external API responses using tools like \*\*unittest.mock\*\* or \*\*responses\*\* to isolate your tests.

7. \*\*Data-Driven Testing\*\*: Implement data-driven tests using \*\*pytest\*\* fixtures or \*\*unittest\*\* parameterized tests to run the same test with different sets of input data.

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### Conclusion

To summarize, building an API test automation framework with Python is an enriching journey, and you’ll find these resources invaluable as you build, iterate, and scale your framework. Make sure to master the key libraries, follow best practices, and experiment with different testing approaches as you go. Happy testing!