CoinGecko API Testing

Project Name: CoinGecko API Testing
Prepared By: Ashwini Parashuram Saravannavar
Tested By: Ashwini Parashuram Saravannavar
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1. Introduction

This document provides an overview of the API testing methodology, test implementation, and automation approach for testing the CoinGecko API endpoints.

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2. Objectives

- Validate API responses against expected outputs.
- Ensure API error handling works correctly.
- Verify performance, security, and data consistency.
- Automate test execution using RestAssured + TestNG.
- Generate structured test execution reports.

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3. Tools & Technologies

- **Programming Language:** Java
- **Frameworks:** TestNG, RestAssured
- **Reporting:** Extent Reports, TestNG Reports, HTML Report
- **Dependency Management:** Maven
- **Version Control:** GitHub
- **Execution Platform:** Postman, Newman, Eclipse

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4. API Endpoints Tested

Endpoint	Description
/api/v3/coins/markets ?vs_currency=usd	Fetch cryptocurrency market data, validation of Status code, format, correctness of currency data,

	pagination, filtering, rate limiting, performance
/api/v3/coins/markets ?vs_currency=usd order=market_cap_asc /api/v3/coins/markets ?vs_currency=usd order=market_cap_desc	Sorting in ascending order and descending order
/api/v3/coins/markets ?vs_currency=usd &ids=bitcoin' OR '1'='1' /api/v3/coins/markets?vs_currency=<script>alert(1)</script> /api/v3/coins/markets?vs_currency=abcxyz	Security Testing(SQL Injection, XSS Scripting and Invalid parameters)

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5. Test Cases

Added in **Test_Plan_CoinGecko** excel file with the Sheet name as "**TestCase**"

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6. Test Implementation

6.1 Setup & Configuration

- **Base URL:** Defined in config.properties.
- **Endpoints:** Retrieved from properties file.

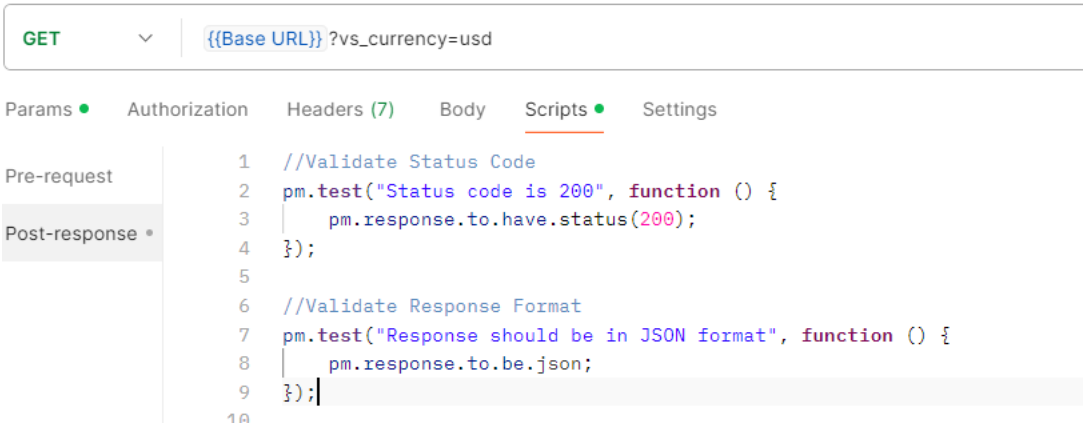
6.2 Sample Test Script

RestAssured + TestNG (Java-Based Automation)

```
@Test(description = "Test Case 1: Validate Status Code", priority = 1)
Run | Debug
public void verifyAPIStatusCode()
{
    Response response = given()
            .queryParam("vs_currency", "usd")
            .when()
            .get(javaUtils.propertyData("endpoint"))
            .then()
            .contentType(ContentType.JSON)
            .extract()
            .response();

        Assert.assertEquals(response.getStatusCode(), 200, "Status code is not 200");
        test.pass("Status code is 200");
        test.info("API response time: " + response.getTime() + "ms");
}
```

Postman Test Script (JavaScript in Postman)



6.3 Test Scripts Execution

- **TestNG Execution (Java-based test scripts):**

  Run the test scripts using **Run ALL** option in TestNG class

```
Run All
public class StatusCodeAndFormatTest extends BaseClass
{
    @Test(description = "TC_001: Validate Status Code", priority = 1)
    Run | Debug
    public void verifyAPIStatusCode()
```

- **Postman Collection Execution using Newman (Command Line Tool):**

```
C:\Users\hp>newman run "C:\Users\hp\Desktop\QSpiders\Software Testing Projects\APITesting.postman_collection.json" -e "C
:\Users\hp\Desktop\QSpiders\Software Testing Projects\CoinGeckoEnv.postman_environment.json"
```

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7. Reporting & Logs

- **Extent Reports:** Generates structured reports with test results and logs.
- **TestNG Reports:** Provides summary and detailed execution results.
- **Newman Reports (Postman Tests):** Newman generates CLI logs and an HTML report of Postman API test execution.

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8. Issues & Improvements

Identified Issues:

Postman Test Scripts:-

1. Data doesn't get updated within the last 60 seconds.
2. 429 Too Many Requests occurs sometimes for some test cases and sometimes doesn't.

RestAssured + TestNG Test Scripts:-

1. API Response time exceeds 500ms in some cases.
2. 429 Too Many Requests occurs sometimes for some test cases and sometimes doesn’t.

Proposed Improvements:

- Reduce response time using caching mechanisms.

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9. Conclusion

The API testing framework validates CoinGecko's API endpoints with automated scripts, structured reporting, and issue tracking.
