superset id: 6405870

Mocking and Stubbing using Mockito

What is Mocking?
Mocking is a unit testing technique where we create **fake objects** that simulate the behavior of real objects. This is useful when:

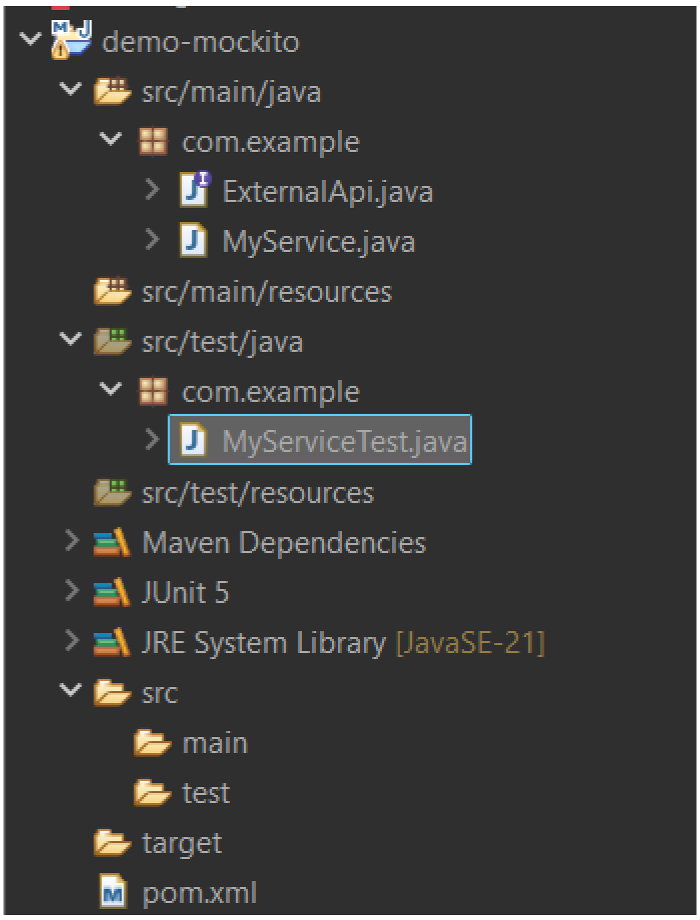
- A class depends on **external APIs**, **databases**, or **network services**
- We want to **isolate** the class under test
- We want **predictable outputs** without actual external calls

In Java, we use libraries like **Mockito** to create mock objects.

Objective of This Exercise

- Create a mock for an external API
- Stub the API method to return predefined data
- Inject the mock into a service class
- Verify the output using **JUnit 5**

Project Structure



```
demo-mockito
  src/main/java
    com.example
      ExternalApi.java
      MyService.java
  src/main/resources
  src/test/java
    com.example
      MyServiceTest.java
  src/test/resources
  Maven Dependencies
  JUnit 5
  JRE System Library [JavaSE-21]
  src
    main
    test
  target
  pom.xml
```

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Depenedecies :

```xml
<project xmlns="http://maven.apache.org/POM/4.0.0"
        xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
        xsi:schemaLocation="http://maven.apache.org/POM/4.0.0
                    http://maven.apache.org/xsd/maven-4.0.0.xsd">

   <modelVersion>4.0.0</modelVersion>

   <groupId>com.example</groupId>        <!-- You can change this -->
   <artifactId>mockito-demo</artifactId>  <!-- You can change this -->
   <version>1.0-SNAPSHOT</version>

   <dependencies>

      <!-- JUnit 5 -->
      <dependency>
         <groupId>org.junit.jupiter</groupId>
         <artifactId>junit-jupiter</artifactId>
         <version>5.10.0</version>
         <scope>test</scope>
      </dependency>

      <!-- Mockito -->
      <dependency>
         <groupId>org.mockito</groupId>
         <artifactId>mockito-core</artifactId>
         <version>5.11.0</version>
         <scope>test</scope>
      </dependency>

   </dependencies>

 <build>
   <plugins>
      <!-- Compiler Plugin for Java 21 -->
      <plugin>
         <groupId>org.apache.maven.plugins</groupId>
         <artifactId>maven-compiler-plugin</artifactId>
         <version>3.11.0</version>
         <configuration>
            <source>21</source>
            <target>21</target>
         </configuration>
      </plugin>

      <!-- JUnit 5 Surefire Plugin -->
      <plugin>
         <groupId>org.apache.maven.plugins</groupId>
         <artifactId>maven-surefire-plugin</artifactId>
         <version>3.0.0</version>
         <configuration>
            <includes>
               <include>**/*Test.java</include>
            </includes>
            </configuration>
        </plugin>
    </plugins>
</build>

</project>
```

Code Snippets
ExternalApi.java

```
package com.example;

public interface ExternalApi {
    String getData();
}
```

This is a simple interface simulating a third-party or external API.

MyService.java

```
package com.example;

public class MyService {
    private ExternalApi api;

    public MyService(ExternalApi api) {
        this.api = api;
    }

    public String fetchData() {
        return api.getData();
    }
}
```

MyService depends on ExternalApi. Instead of calling a real API, we'll inject a mock.

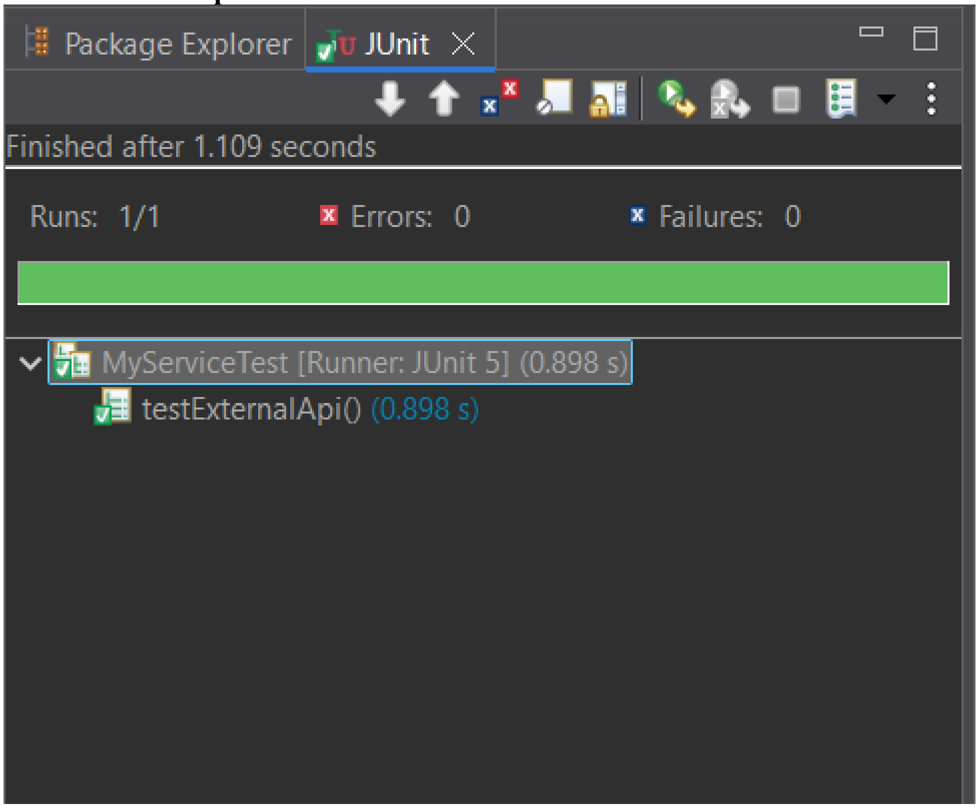
MyServiceTest.java

```
package com.example;

import org.junit.jupiter.api.Test;
import org.mockito.Mockito;

import static org.mockito.Mockito.*;
import static org.junit.jupiter.api.Assertions.*;

public class MyServiceTest {

    @Test
    public void testExternalApi() {
        // Step 1: Create mock
        ExternalApi mockApi = Mockito.mock(ExternalApi.class);

        // Step 2: Stub method
        when(mockApi.getData()).thenReturn("Mock Data");
        // Step 3: Inject mock into service
        MyService service = new MyService(mockApi);


       // Step 4: Verify result
        String result = service.fetchData();
        assertEquals("Mock Data", result);
    }
}
```

This test:

- Creates a mock for ExternalApi
- Stubs getData() to return "Mock Data"
- Verifies that MyService.fetchData() returns the expected value

Screenshot: Output



```
Finished after 1.109 seconds

Runs: 1/1        Errors: 0        Failures: 0

MyServiceTest [Runner: JUnit 5] (0.898 s)
    testExternalApi() (0.898 s)
```