3. Mockito exercises

Exercise 1: Mocking and Stubbing

CODE

File name: ExternalApi.java

```
package com.example.mock;

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

File name: MyService.java

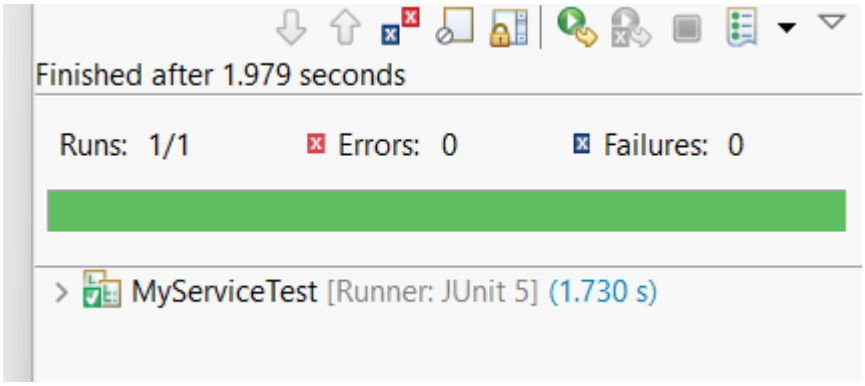
```
package com.example.mock;

public class MyService {
   private ExternalApi api;

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

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

File name: MyServiceTest.java

```
package com.example.mock;

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

public class MyServiceTest {

        @Test
        public void testExternalApi() {
```

```
        ExternalApi mockApi = mock(ExternalApi.class);
        when(mockApi.getData()).thenReturn("Mock Data"); // ✅ Stubbed

        MyService service = new MyService(mockApi);
        String result = service.fetchData();

        assertEquals("Mock Data", result); // ✅ Should pass
    }

}
```

OUTPUT



Exercise 2: Verifying Interactions

CODE

File name: ExternalApi.java

```
package com.example.mock;

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

File name: MyService.java

```
package com.example.mock;

public class MyService {
    private ExternalApi api;

    public MyService(ExternalApi api) {
```

```
        this.api = api;
    }

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

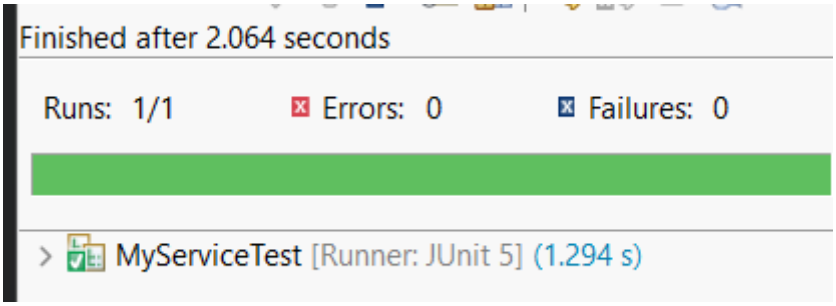
File name: MyServiceTest.java

```
package com.example.mock;

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

public class MyServiceTest {

    @Test
    public void testVerifyInteraction() {
        // 1. Create mock object
        ExternalApi mockApi = mock(ExternalApi.class);

        // 2. Stub the method (optional for this test)
        when(mockApi.getData()).thenReturn("Mocked Response");

        // 3. Inject into MyService
        MyService service = new MyService(mockApi);

        // 4. Call the method
        String result = service.fetchData();

        // 5. Verify interaction
        verify(mockApi).getData();  // This confirms getData() was called once

        // 6. (Optional) Check result
```

```
        assertEquals("Mocked Response", result);

        // 7. Print output (for clarity)
        System.out.println("Verified: getData() was called, and result = " + result);
    }
}
```

OUTPUT

```
OpenJDK 64-Bit Server VM warning: Sharing is only supported fo
Verified: getData() was called, and result = Mocked Response
```



Exercise 3: Argument Matching

CODE

File name: UserRepository.java

```
package com.example.mock;

public interface UserRepository {
    void saveUser(String name);
}
```

File name: UserService.java

```
package com.example.mock;
public class UserService {
    private UserRepository repository;

    public UserService(UserRepository repository) {
        this.repository = repository;
    }
    public void register(String name) {
        if (name != null && !name.isEmpty()) {
            repository.saveUser(name);
```

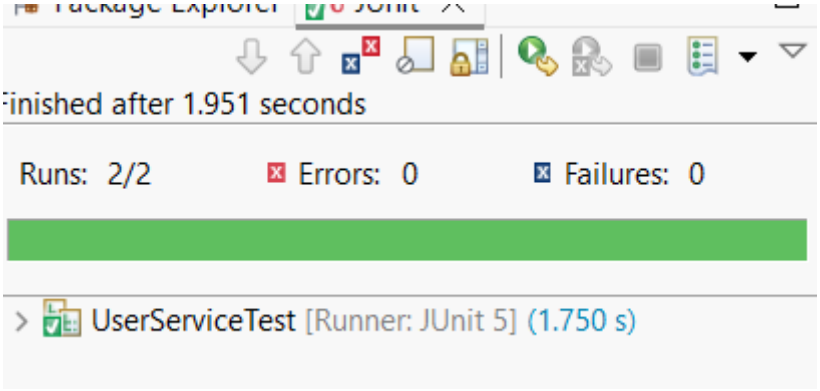
```
    }
  }
}
```

File name: UserServiceTest.java

```
package com.example.mock;
import org.junit.jupiter.api.Test;
import static org.mockito.Mockito.*;
import static org.mockito.ArgumentMatchers.*;
public class UserServiceTest {
  @Test
  public void testRegisterWithExactArgument() {
    // 1. Create mock
    UserRepository mockRepo = mock(UserRepository.class);
    // 2. Inject into service
    UserService service = new UserService(mockRepo);
    // 3. Call method
    service.register("Alice");
    // 4. Verify exact match
    verify(mockRepo).saveUser("Alice");
    // 5. Optional: verify only once
    verify(mockRepo, times(1)).saveUser(eq("Alice"));
    System.out.println("Verified: saveUser(\"Alice\") was called once");
  }
  @Test
  public void testRegisterWithAnyString() {
    UserRepository mockRepo = mock(UserRepository.class);
    UserService service = new UserService(mockRepo);
    service.register("Bob");
    // Match any string (not necessarily "Bob")
    verify(mockRepo).saveUser(anyString());
 System.out.println(" Verified: saveUser() was called with any string");
  }
}
```

OUTPUT

```
Verified: saveUser() was called with any string
Verified: saveUser("Alice") was called once
```



Exercise 4: Handling Void Methods

CODE

File name: Notifier.java

```
package com.example.mock;

public interface Notifier {
    void sendNotification(String message);
}
```

File name: AlertService.java

```
package com.example.mock;
public class AlertService {
    private Notifier notifier;
    public AlertService(Notifier notifier) {
        this.notifier = notifier;
    }
    public void alertUser(String message) {
        notifier.sendNotification(message);
    }
}
```

File name: AlertServiceTest.java

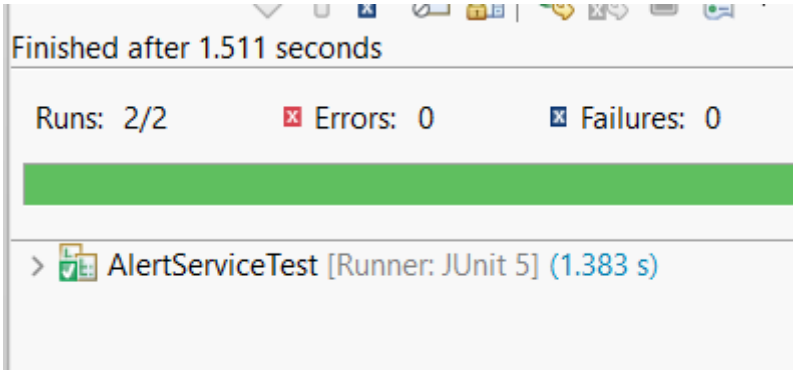
```
package com.example.mock;

import org.junit.jupiter.api.Test;
```

```
import static org.mockito.Mockito.*;

public class AlertServiceTest {

    @Test
    public void testVoidMethodCalled() {
        // 1. Create mock
        Notifier mockNotifier = mock(Notifier.class);

        // 2. Inject into service
        AlertService service = new AlertService(mockNotifier);

        // 3. Call method
        service.alertUser("Low Battery");

        // 4. Verify interaction
        verify(mockNotifier).sendNotification("Low Battery");

        System.out.println(" Verified: sendNotification(\"Low Battery\") was called.");
    }

    @Test
    public void testStubVoidMethod() {
        // 1. Create mock
        Notifier mockNotifier = mock(Notifier.class);

        // 2. Stub the void method to do nothing (optional)
        doNothing().when(mockNotifier).sendNotification(anyString());

        // 3. Inject and call
        AlertService service = new AlertService(mockNotifier);
        service.alertUser("Warning!");

        // 4. Verify
```

```
        verify(mockNotifier).sendNotification(eq("Warning!"));

        System.out.println(" Verified: sendNotification(\"Warning!\") stubbed and called.");
    }
}
```

OUTPUT

```
 Verified: sendNotification("Low Battery") was called.
 Verified: sendNotification("Warning!") stubbed and called.
```



Exercise 5: Mocking and Stubbing with Multiple Returns

CODE

File name: ExternalApi.java

```
package com.example.mock;

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

File name: MyService.java

```
package com.example.mock;

public class MyService {
    private ExternalApi api;

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

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

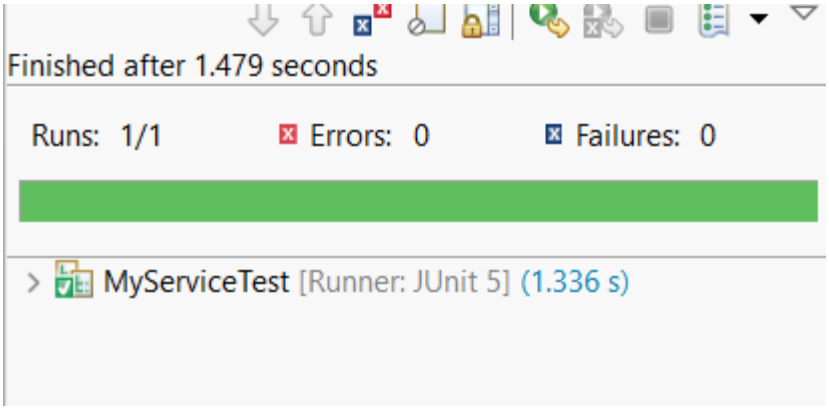
```
    }
}
```

File name: MyserviceTest.java

```
package com.example.mock;

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

public class MyServiceTest {

    @Test
    public void testMultipleReturns() {
        // 1. Create mock
        ExternalApi mockApi = mock(ExternalApi.class);

        // 2. Stub method to return multiple values
        when(mockApi.getData()).thenReturn("First Call").thenReturn("Second Call").thenReturn("Third Call");

        // 3. Inject into service
        MyService service = new MyService(mockApi);

        // 4. Call method multiple times and assert
        assertEquals("First Call", service.fetchData());
        assertEquals("Second Call", service.fetchData());
        assertEquals("Third Call", service.fetchData());

        System.out.println("First, second, and third calls returned different responses as expected.");
    }
}
```

OUTPUT

```
OpenJDK 64-Bit Server VM warning: Sharing is only supported for boot loader
First, second, and third calls returned different responses as expected.
```



Exercise 6: Verifying Interaction Order

CODE

File name: ExternalApi.java

```
package com.example.mock;

public interface ExternalApi {
    String stepOne();
    String stepTwo();
    String stepThree();
}
```

File name: MyService.java

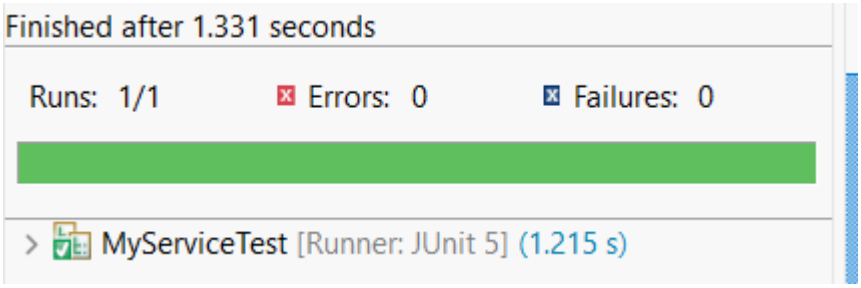
```
package com.example.mock;

public class MyService {
    private ExternalApi api;

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

    public void performSteps() {
        api.stepOne();
        api.stepTwo();
        api.stepThree();
    }
}
```

File name: MyServiceTest.java

```
package com.example.mock;

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

import static org.mockito.Mockito.*;

public class MyServiceTest {

    @Test
    public void testVerifyInteractionOrder() {
        // 1. Create mock
        ExternalApi mockApi = mock(ExternalApi.class);

        // 2. Inject into service
        MyService service = new MyService(mockApi);

        // 3. Call method
        service.performSteps();

        // 4. Create InOrder verifier
        InOrder inOrder = inOrder(mockApi);

        // 5. Verify call order
        inOrder.verify(mockApi).stepOne();
        inOrder.verify(mockApi).stepTwo();
        inOrder.verify(mockApi).stepThree();

        System.out.println("Verified: stepOne(), stepTwo(), and stepThree() were called in correct order.");
    }
}
```

OUTPUT

```
Verified: stepOne(), stepTwo(), and stepThree() were called in correct order.
```



Exercise 7: Handling Void Methods with Exceptions

CODE

File name: Notifier.java

```
package com.example.mock;
public interface Notifier {
   void send(String message);
}
```

File name: AlertService.java

```
package com.example.mock;
public class AlertService {
   private Notifier notifier;
   public AlertService(Notifier notifier) {
      this.notifier = notifier;
   }
   public void triggerAlert(String msg) {
      notifier.send(msg);
   }
}
```

File name: AlertServiceTest.java

```
package com.example.mock;
import org.junit.jupiter.api.Test;
import static org.mockito.Mockito.*;
import static org.junit.jupiter.api.Assertions.*;
public class AlertServiceTest {
   @Test
   public void testVoidMethodThrowsException() {
```

```
    // 1. Create mock
    Notifier mockNotifier = mock(Notifier.class);

    // 2. Stub the void method to throw exception
    doThrow(new RuntimeException("Failed to send")).when(mockNotifier).send("Danger");

    // 3. Inject into AlertService
    AlertService service = new AlertService(mockNotifier);

    // 4. Assert exception is thrown
    assertThrows(RuntimeException.class, () -> {
        service.triggerAlert("Danger");
    });

    // 5. Verify interaction
    verify(mockNotifier).send("Danger");

    System.out.println("Verified: send(\"Danger\") threw exception and was called.");
  }
}
```

OUTPUT

```
OpenJDK 64-Bit Server VM warning: Sharing is only supported
Verified: send("Danger") threw exception and was called.
```