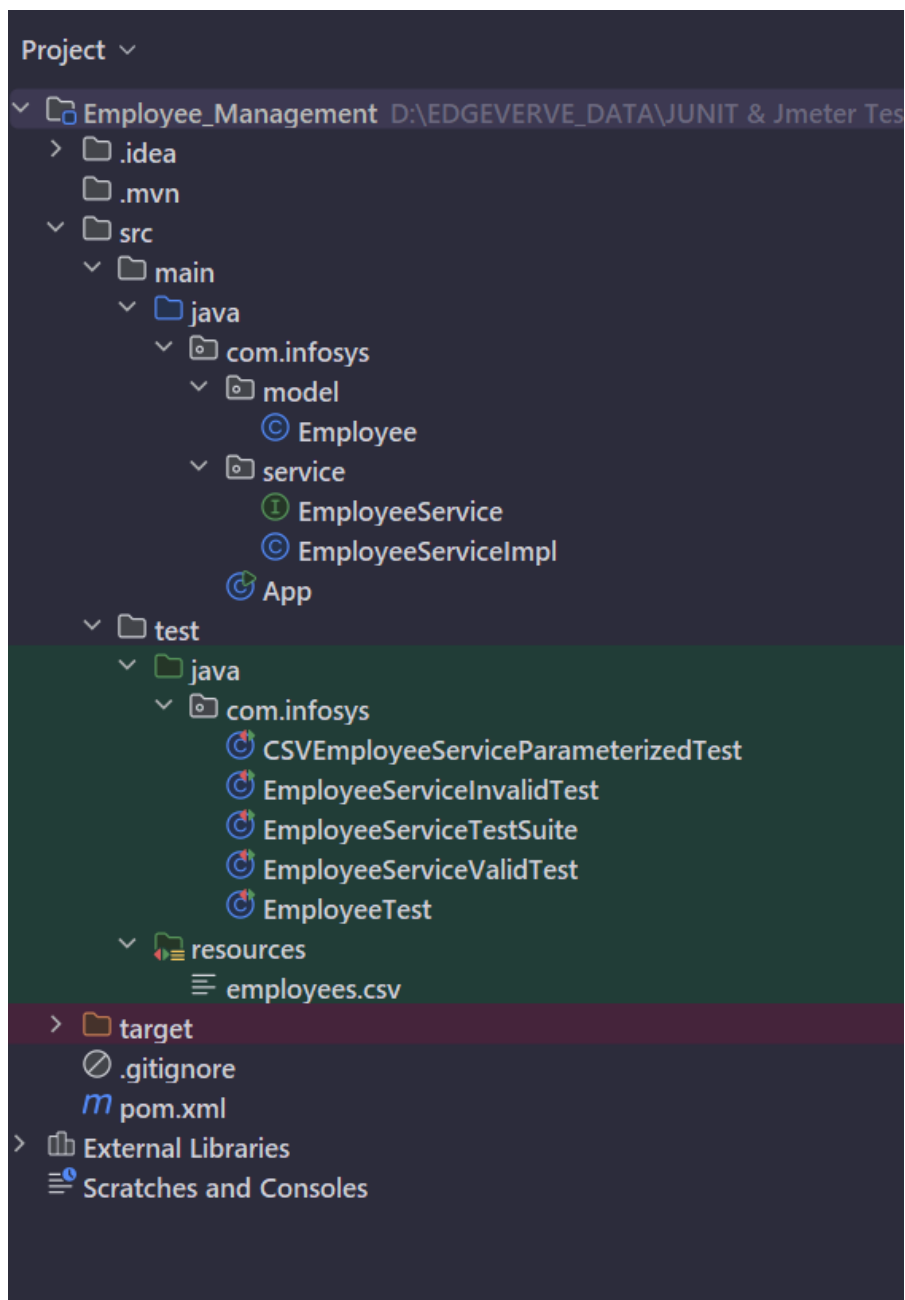


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## Assignment\_1 (JUnit Testing)

### Folder Structure



## pom.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.infosys</groupId>
  <artifactId>Employee_Management</artifactId>
  <version>1.0-SNAPSHOT</version>
  <packaging>jar</packaging>

  <name>Employee_Management</name>
  <url>http://maven.apache.org</url>

  <properties>
    <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
  </properties>

  <dependencies>
    <dependency>
      <groupId>junit</groupId>
      <artifactId>junit</artifactId>
      <version>3.8.1</version>
      <scope>test</scope>
    </dependency>

    <!-- https://mvnrepository.com/artifact/org.junit.jupiter/junit-
jupiter-api -->
    <dependency>
      <groupId>org.junit.jupiter</groupId>
      <artifactId>junit-jupiter-api</artifactId>
      <version>5.11.4</version>
      <scope>test</scope>
    </dependency>

    <!-- https://mvnrepository.com/artifact/org.junit.jupiter/junit-
jupiter-engine -->
    <dependency>
      <groupId>org.junit.jupiter</groupId>
      <artifactId>junit-jupiter-engine</artifactId>
      <version>5.11.4</version>
      <scope>test</scope>
    </dependency>

    <!-- https://mvnrepository.com/artifact/org.junit.platform/junit-
platform-suite -->
    <dependency>
      <groupId>org.junit.platform</groupId>
      <artifactId>junit-platform-suite</artifactId>
      <version>1.9.1</version>
      <scope>test</scope>
    </dependency>

    <!-- https://mvnrepository.com/artifact/org.junit.jupiter/junit-
jupiter-params -->
    <dependency>
      <groupId>org.junit.jupiter</groupId>
      <artifactId>junit-jupiter-params</artifactId>
```

```

        <version>5.11.4</version>
        <scope>test</scope>
    </dependency>
</dependencies>

<build>
    <plugins>
        <plugin>
            <!--
https://mvnrepository.com/artifact/org.apache.maven.plugins/maven-surefire-
plugin -->
            <groupId>org.apache.maven.plugins</groupId>
            <artifactId>maven-surefire-plugin</artifactId>
            <version>3.5.2</version>
        </plugin>
    </plugins>
</build>
</project>

```

## Employee.java

```

package com.infosys.model;

public class Employee {

    private int id;
    private String name;
    private double monthlySalary;

    public Employee(int id, String name, double monthlySalary) {
        this.id = id;
        this.name = name;
        this.monthlySalary = monthlySalary;
    }

    public int getId() {
        return id;
    }

    public void setId(int id) {
        this.id = id;
    }

    public String getName() {
        return name;
    }

    public void setName(String name) {
        this.name = name;
    }

    public double getMonthlySalary() {
        return monthlySalary;
    }

    public void setMonthlySalary(double monthlySalary) {
        this.monthlySalary = monthlySalary;
    }
}

```

## EmployeeService.java

```
package com.infosys.service;

import com.infosys.model.Employee;

public interface EmployeeService {

    double calculateHike(Employee employee);
    double calculateYearlySalary(Employee employee);
}
```

## EmployeeServiceImpl.java

```
package com.infosys.service;

import com.infosys.model.Employee;

public class EmployeeServiceImpl implements EmployeeService{

    @Override
    public double calculateYearlySalary(Employee employee) {

        double yearlySalary = 0;
        yearlySalary = employee.getMonthlySalary()*12;
        return yearlySalary;
    }

    @Override
    public double calculateHike(Employee employee) {

        double hike = 0;
        if(employee.getMonthlySalary() < 10000){
            hike = 2000;
        }
        else {
            hike = 1000;
        }
        return hike;
    }
}
```

## Test :

## EmployeeTest.java

```
package com.infosys;

import com.infosys.model.Employee;
import com.infosys.service.EmployeeServiceImpl;
import org.junit.jupiter.api.*;

import static org.junit.jupiter.api.Assertions.*;
```

```

public class EmployeeTest {

    private EmployeeServiceImpl employeeService;

    @BeforeAll
    static void beforeAll()
    {
        System.out.println("BeforeAll is executed");
    }

    @AfterAll
    static void afterAll()
    {
        System.out.println("afterAll is executed");
    }

    @BeforeEach
    void init()
    {
        System.out.println("Setup: Initializing EmployeeService...");
        employeeService = new EmployeeServiceImpl();
    }

    @AfterEach
    void cleanupCode()
    {
        System.out.println("Teardown: Cleaning up after test...");
    }

    @Test
    @DisplayName("Test Yearly Salary Calculation for 8000 Monthly")
    void testCalculateYearlySalary() {
        Employee emp = new Employee(1, "Zenitsu", 10000);
        double actual = employeeService.calculateYearlySalary(emp);
        double expected = 120000;
        assertEquals(expected, actual);
    }

    @Test
    @DisplayName("Test Hike Calculation for < 10000 Monthly")
    void testCalculateHike_LowSalary() {
        Employee e = new Employee(2, "Inosuke", 8000);
        double actual = employeeService.calculateHike(e);
        double expected = 2000;
        assertEquals(expected, actual);
    }

    @Test
    @DisplayName("Test Hike Calculation for >= 10000 Monthly")
    void testCalculateHike_HighSalary() {
        Employee e = new Employee(3, "Tanjiro", 12000);
        double actual = employeeService.calculateHike(e);
        double expected = 1000;
        assertEquals(expected, actual);
    }

    @Test
    @Disabled

```

```

        @DisplayName("Disabled test")
        void testFail()
        {
            System.out.println("This test is disabled and should not run.");
        }
    }
}

```

## Output

The screenshot shows the IDE interface with the `EmployeeTest.java` file open. The test results pane shows the following output:

```

Run EmployeeTest x
3 tests passed, 1 ignored 4 tests total, 33 ms
C:\Program Files\Java\jdk-22\bin\java.exe ...
BeforeAll is executed
void com.infosys.EmployeeTest.testFail() is @Disabled
Setup: Initializing EmployeeService...
Teardown: Cleaning up after test...
Setup: Initializing EmployeeService...
Teardown: Cleaning up after test...
Setup: Initializing EmployeeService...
Teardown: Cleaning up after test...
afterAll is executed
Process finished with exit code 0

```

This screenshot is a zoomed-in view of the test results pane, showing the following output:

```

Run EmployeeTest x
3 tests passed, 1 ignored 4 tests total, 33 ms
void com.infosys.EmployeeTest.testFail() is @Disabled

```

## EmployeeServiceValidTest.java

```

package com.infosys;

import com.infosys.model.Employee;
import com.infosys.service.EmployeeServiceImpl;
import org.junit.jupiter.api.*;
import static org.junit.jupiter.api.Assertions.assertEquals;

public class EmployeeServiceValidTest {

```

```

EmployeeServiceImpl employeeService;

@BeforeEach
void init()
{
    System.out.println("Setup: Initializing EmployeeService...");
    employeeService = new EmployeeServiceImpl();
}

@Test
@Tag("Valid")
@DisplayName("Valid: Hike for 9500 Salary")
void validHikeLowSalary() {
    Employee e = new Employee(1, "John", 9500);
    double actual = employeeService.calculateHike(e);
    double expected = 2000;
    assertEquals(expected, actual);
}

@Test
@DisplayName("Valid: Yearly Salary for 10000 Monthly")
void validYearlySalary() {
    Employee e = new Employee(2, "Jane", 10000);
    double actual = employeeService.calculateYearlySalary(e);
    double expected = 120000;
    assertEquals(expected, actual);
}
}

```

## Output

The screenshot displays an IDE interface with the following components:

- Project Explorer (Left):** Shows a project structure with a `test` directory containing `com.infosys`. Under `com.infosys`, there are several test classes, including `EmployeeServiceValidTest`, which is currently selected.
- Editor (Top Right):** Displays the source code of `EmployeeServiceValidTest.java`. The code includes imports for JUnit 5, a class definition, and two test methods: `validHikeLowSalary` and `validYearlySalary`. The `init` method is annotated with `@BeforeEach`.
- Run Console (Bottom):** Shows the execution results of the tests. It indicates that 2 tests passed out of 2 tests total, with a total execution time of 53 ms. The individual test results are:
  - `Valid: Yearly Salary for 10000 Monthly` (49 ms)
  - `Valid: Hike for 9500 Salary` (4 ms)
- Output Window (Bottom Right):** Displays the standard output of the tests. It shows the setup message: `Setup: Initializing EmployeeService...` and confirms that the process finished with exit code 0.

## EmployeeServiceInvalidTest.java

```
package com.infosys;

import com.infosys.model.Employee;
import com.infosys.service.EmployeeServiceImpl;
import org.junit.jupiter.api.BeforeEach;
import org.junit.jupiter.api.DisplayName;
import org.junit.jupiter.api.Tag;
import org.junit.jupiter.api.Test;

import static org.junit.jupiter.api.Assertions.assertTrue;

public class EmployeeServiceInvalidTest {

    EmployeeServiceImpl employeeService;

    @BeforeEach
    void init()
    {
        System.out.println("Setup: Initializing EmployeeService...");
        employeeService = new EmployeeServiceImpl();
    }

    @Test
    @Tag("Invalid")
    @DisplayName("Invalid: Negative Monthly Salary")
    void invalidSalaryTest() {
        Employee e = new Employee(3, "Bob", -5000);
        double yearly = employeeService.calculateYearlySalary(e);
        assertTrue(yearly < 0, "Yearly salary should be negative for invalid input");
    }
}
```

## Output

The screenshot displays an IDE interface with the following components:

- Project Explorer (Left):** Shows the project structure. The `test` directory contains `com.infosys`, which includes `EmployeeServiceInvalidTest`, `EmployeeServiceValidTest`, and `EmployeeTest`.
- Editor (Center):** Displays the source code of `EmployeeServiceInvalidTest.java`, showing the package, imports, and the `invalidSalaryTest` method.
- Run Console (Bottom):** Shows the execution results. It indicates that 1 test passed out of 1 test total, taking 49 ms. The output text includes "Setup: Initializing EmployeeService..." and "Process finished with exit code 0".



## EmployeeServiceParameterizedTest.java

```
package com.infosys;

import com.infosys.model.Employee;
import com.infosys.service.EmployeeServiceImpl;
import org.junit.jupiter.params.ParameterizedTest;
import org.junit.jupiter.params.provider.CsvFileSource;
import static org.junit.jupiter.api.Assertions.assertEquals;

public class CSVEmployeeServiceParameterizedTest {

    private EmployeeServiceImpl employeeService = new
EmployeeServiceImpl();

    @ParameterizedTest
    @CsvFileSource(files = "src/test/resources/employees.csv",
numLinesToSkip = 1)
    void testYearlySalaryWithCsv(int id, String name, double monthlySalary,
double expectedYearly) {
        Employee e = new Employee(id, name, monthlySalary);
        double actual = employeeService.calculateYearlySalary(e);
        double expected = expectedYearly;
        assertEquals(expected, actual);
    }
}
```

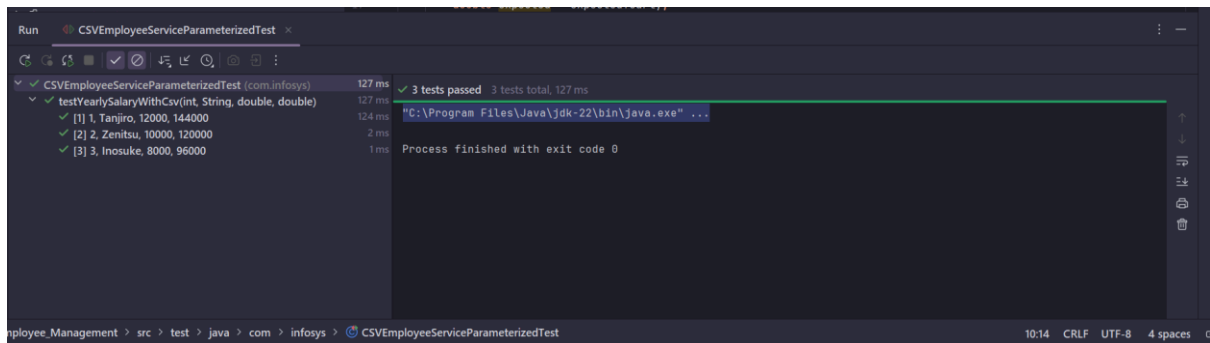
**employees.csv**

```
employees.csv
```

	id,name,monthlySalary,expectedYearly
1	1,Tanjiro,12000,144000
2	2,Zenitsu,10000,120000
3	3,Inosuke,8000,96000
4	
5	
6	
7	

[illegible]

## Output



## EmployeeServiceTestSuite.java

```
package com.infosys;

import org.junit.jupiter.api.DisplayName;
import org.junit.platform.suite.api.ExcludeTags;
import org.junit.platform.suite.api.IncludeTags;
import org.junit.platform.suite.api.SelectClasses;
import org.junit.platform.suite.api.Suite;

@Suite
@SelectClasses({EmployeeServiceValidTest.class,
EmployeeServiceInvalidTest.class})
@IncludeTags({"Valid", "Invalid"})
@DisplayName("Employee Service Test Suite")
public class EmployeeServiceTestSuite {
}
```

## Output

