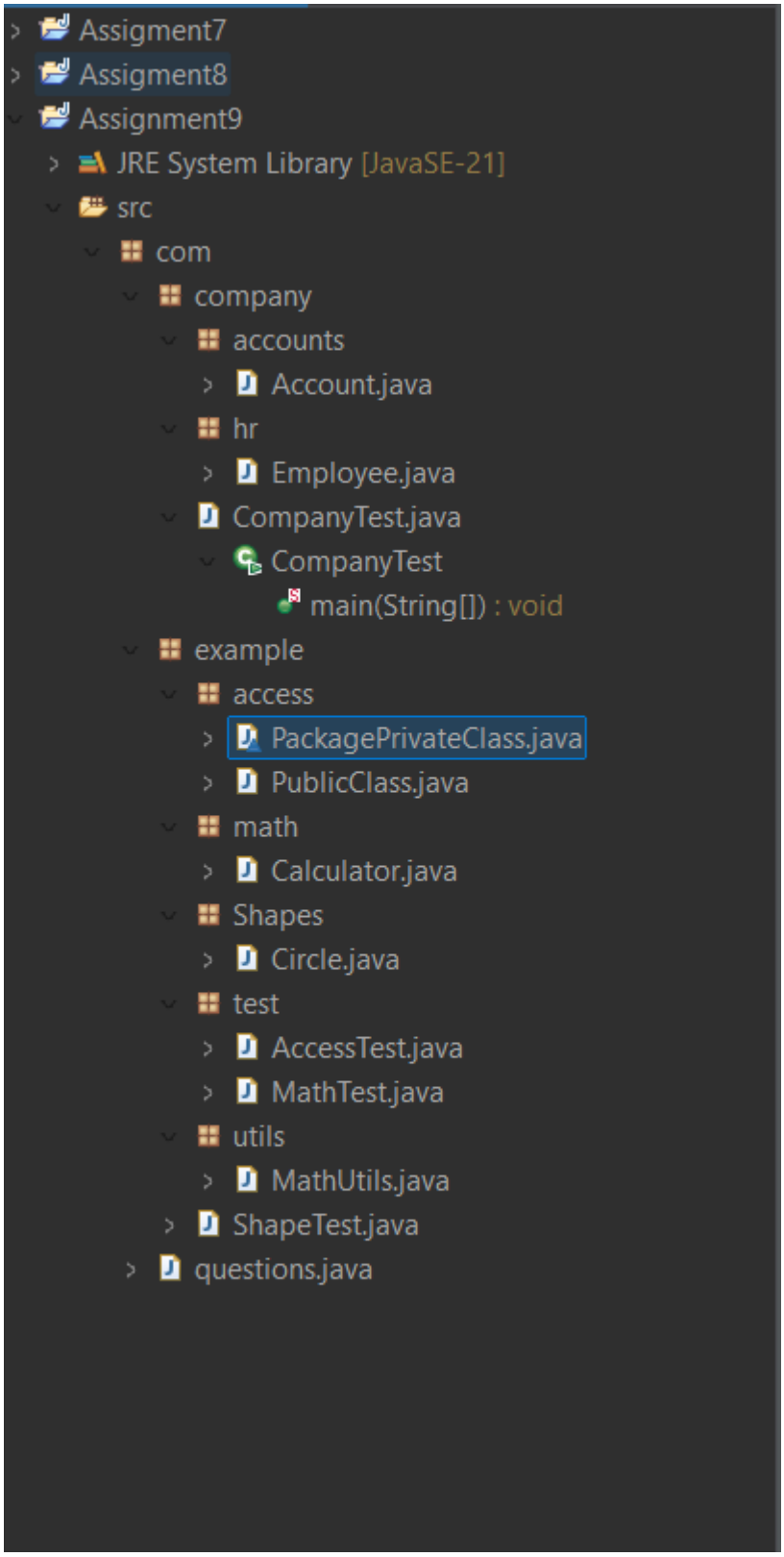
PARVATHAM RAMCHARAN

PG-DAC AUG 2025

ASSIGNMENT 9



1. Problem 1: Basic Package Creation and Usage

Task: Create a package named com.example.math and add a class Calculator with methods for addition and subtraction. Then, create another class MathTest in the com.example.test package to use the Calculator class

Calculator.java

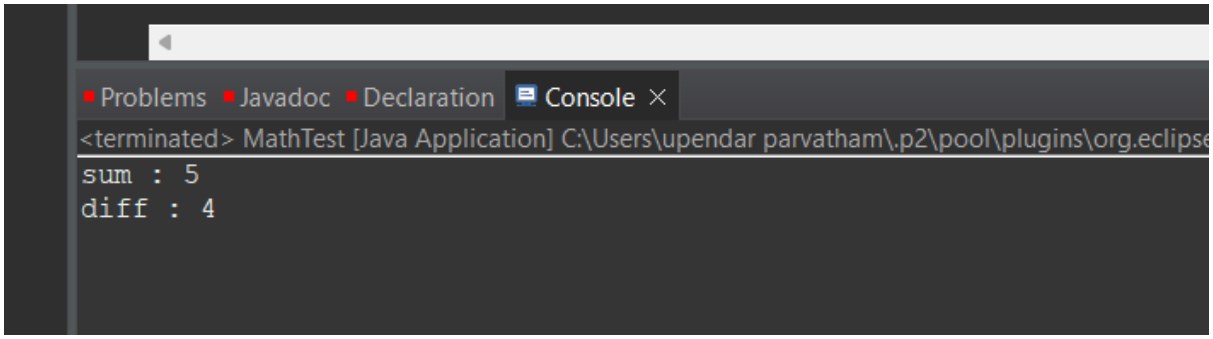
```
package com.example.math;
public class Calculator {
	public int addition(int a ,int b) {
		return a+b;
	}
	public int subtraction(int a ,int b) {
		return a-b;
	}
}
```

MathTest.java:

```
package com.example.test;

import com.example.math.Calculator;

public class MathTest {
    public static void main(String[] args) {
			Calculator calc = new Calculator();
			int sum = calc.addition(2,3);
			int diff = calc.subtraction(8,4);

			System.out.println("sum : "+sum);
			System.out.println("diff : "+diff);
		}
```

}

Output:



Problem 2: Using Multiple Classes from Different Packages

Task: Create a package com.example.shapes with a class Circle and another package com.example.utils with a class MathUtils. The Circle class should use MathUtils (it should have a method to provide PI value) to calculate the area of the circle. Then, create a ShapeTest class to demonstrate this functionality.

MathUtils.java:

```
package com.example.utils;
public class MathUtils {
   public static double getPI() {
          return 3.14;
   }
}
```

Circle.java

```
package com.example.Shapes;
```

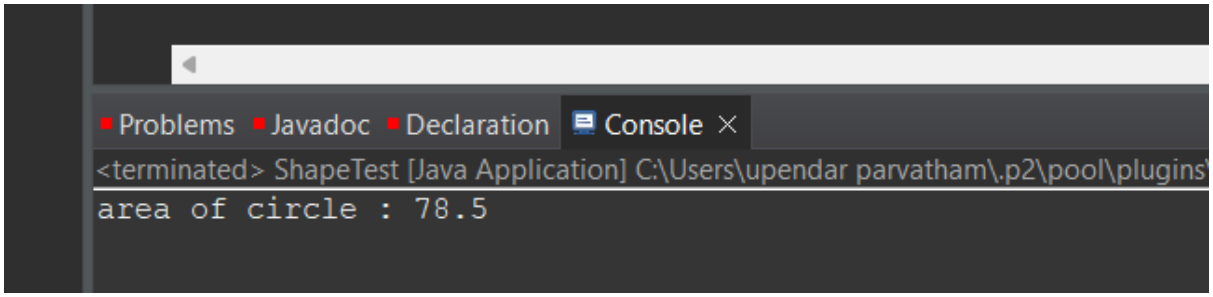
```
import com.example.utils.MathUtils;
public class Circle {
//1.via constructor
//              private double r;
//        public Circle(double r) {
//          this.r=r;
//        }
//        public double area() {
//          return MathUtils.getPI()*r*r;
//        }


//2.via method
              public double area(double r) {
                    return MathUtils.getPI()*r*r;
              }
}
```

ShapeTest.java:

```
package com.example;
import com.example.Shapes.Circle;
public class ShapeTest {

        public static void main(String[] args) {
                //1.via constructor
                //Circle c = new Circle(5.0);
                //System.out.println("area of circle : "+c.area());



                //2.via method
```

```
        Circle c = new Circle();
        System.out.println("area of circle : "+c.area(5.0));
    }

}
```

Output:



Problem 3: Creating Sub-Packages

Task: Create a main package com.company with sub-packages accounts and hr. The accounts package should have a class Account with a method displayAccountDetails(), and the hr package should have a class Employee with a method displayEmployeeDetails(). Demonstrate the usage of these classes in a CompanyTest class.

Employee.java:

```
package com.company.hr;

public class Employee {
```

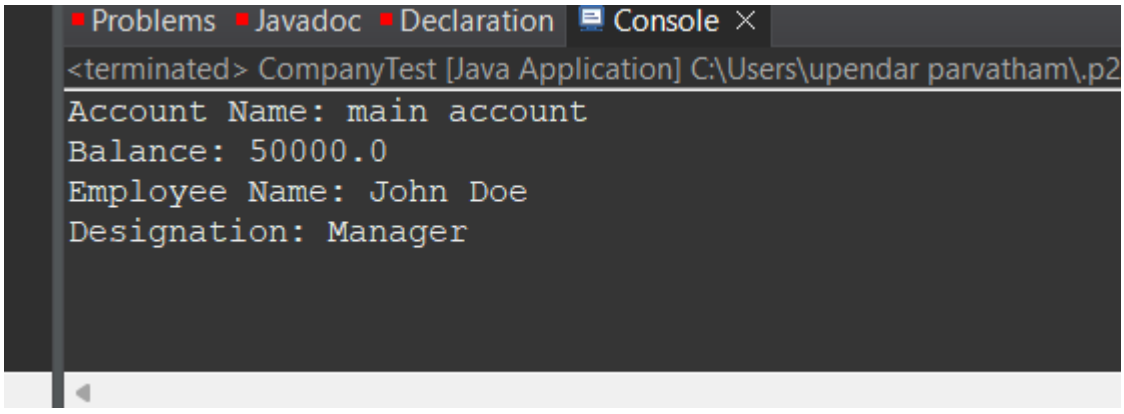
```
    private String name;
    private String designation;

    public Employee(String name, String designation) {
       this.name = name;
       this.designation = designation;
    }

    public void displayEmployeeDetails() {
       System.out.println("Employee Name: " + name);
       System.out.println("Designation: " + designation);
    }

}
```

```
package com.company.accounts;

public class Account {

        private String Accountname;
        private double balance;
        public Account(String AccountName,double balance) {
                this.Accountname=AccountName;
                this.balance=balance;
        }
        public void displayAccountDetails() {
         System.out.println("Account Name: " + Accountname);
         System.out.println("Balance: " + balance);
       }
```

```
        }
```

```
package com.company;
import com.company.accounts.Account;
import com.company.hr.Employee;
public class CompanyTest {
   public static void main(String[] args) {
                    Account acc  = new Account("main account",50000.0);
                    acc.displayAccountDetails();

                    Employee emp = new Employee("John Doe", "Manager");
      emp.displayEmployeeDetails();
          }
}
```

Ouput:



Problem 4: Package-Private Access and Public Classes

Task: Create a package com.example.access with two classes: PublicClass and PackagePrivateClass. The PublicClass should have a public method showPublicMessage(), and the PackagePrivateClass should have a package-private method showPackagePrivateMessage(). Create a class

AccessTest to demonstrate that the package-private method cannot be accessed

outside its package.

```
package com.example.access;

// Notice: no 'public' before class → package-private
class PackagePrivateClass {

   // Method with package-private (default) access
   void showPackagePrivateMessage() {
      System.out.println("This is a PACKAGE-PRIVATE method, accessible only within
com.example.access package.");
   }
}
```

```
package com.example.access;

public class PublicClass {
   public void showPublicMessage() {
      System.out.println("This is a PUBLIC method, accessible everywhere.");

   }
}
```

```
package com.example.test;

import com.example.access.PublicClass;
// ✕ Can't import PackagePrivateClass because it is not public

public class AccessTest {
```

```
    public static void main(String[] args) {
        PublicClass pub = new PublicClass();
        pub.showPublicMessage();

        // ✕ The following line will NOT compile, because PackagePrivateClass is not visible
        // PackagePrivateClass ppc = new PackagePrivateClass();
        // ppc.showPackagePrivateMessage();
    }
}
```

Output: