

Implementation of Access Modifiers in Java

Aim:

Write a Java program to implement different access modifiers.

PRE LAB EXERCISE

QUESTIONS

1. What are the 4 access modifiers available in Java?

Java has **four access modifiers**:

1. **private**
2. **default** (no keyword)
3. **protected**
4. **public**

2. Which access modifiers can be used in Java to control access to class members?

To control access to **class members** (variables, methods, constructors), Java uses:

- **private**
- **default**
- **protected**
- **public**

All four modifiers can be used for class members.

IN LAB EXERCISE

Objective

To demonstrate different access modifiers such as Default, Private, Protected, and Public using Java programs.

	Default	Private	Protected	Public
Same Class	Yes	Yes	Yes	Yes
Same Package Subclass	Yes	No	Yes	Yes
Same Package Non-Subclass	Yes	No	Yes	Yes
Different Package Subclass	No	No	Yes	Yes
Different Package Non-Subclass	No	No	No	Yes

Fig: Comparison table of Access Modifiers in Java

Source Code

```
// Default Access modifier

class Car {

    String model; // default access
}

public class Main {

    public static void main(String[] args){
        Car c = new Car();
        c.model = "Tesla"; // accessible within the same package
        System.out.println(c.model);
    }
}
```

```
}
```

Output:

Tesla

Tesla

//Private Access Modifier

```
class Person {  
    // private variable  
    private String name;  
  
    public void setName(String name) {  
        this.name = name; // accessible within class  
    }  
  
    public String getName() {  
        return name;  
    }  
}  
  
public class Geeks {  
    public static void main(String[] args)  
    {  
        Person p = new Person();  
        p.setName("Alice");  
  
        // System.out.println(p.name);  
        // Error: 'name'  
        // has private access  
        System.out.println(p.getName());  
    }  
}
```

Output

Alice

Alice

//Protected Access Modifier

```
class Vehicle {  
    protected int speed; // protected member  
}  
  
class Bike extends Vehicle {  
    void setSpeed(int s)  
    {  
        speed = s; // accessible in subclass  
    }  
    int getSpeed()  
    {  
        return speed; // accessible in subclass  
    }  
}  
  
public class Main {  
    public static void main(String[] args){  
        Bike b = new Bike();  
        b.setSpeed(100);  
        System.out.println("Access via subclass method: "+ b.getSpeed());  
        Vehicle v = new Vehicle();  
        System.out.println(v.speed);  
    }  
}
```

Output

Access via subclass method: 100

0

```
Access via subclass method: 100  
0
```

//Public Access Modifier

```
class MathUtils {  
    public static int add(int a, int b) {  
        return a + b;  
    }  
}  
  
public class Main {  
    public static void main(String[] args) {  
        System.out.println(MathUtils.add(5, 10)); // accessible anywhere  
    }  
}
```

Output

15

```
15
```

POST LAB EXERCISE

1. Write a Java program to implement Default access modifier which has a default class within the same package and a default class from a different package.

Default access means:

- No keyword is used.
- Accessible only **within the same package**.
- Not accessible from different package.

Package 1:

File TestDefault.java

```
package package1;

class DefaultClass { // default class

    void display() { // default method
        System.out.println("Default class inside same package");
    }
}

public class TestDefault {
    public static void main(String[] args) {

        DefaultClass obj = new DefaultClass();
        obj.display(); // Accessible (same package)
    }
}
```

Package 2:

File: TestOutside.java

```
package package2;

import package1.DefaultClass;

public class TestOutside {
    public static void main(String[] args) {

        DefaultClass obj = new DefaultClass();
        obj.display();
    }
}
```

2. Which access modifier provides the highest level of access?

public provides the highest level of access.

Because public members are accessible:

- Inside same class
- Inside same package
- In subclasses
- In different packages

ASSESSMENT

Description	Max Marks	Marks Awarded
Pre Lab Exercise	5	
In Lab Exercise	10	
Post Lab Exercise	5	
Viva	10	
Total	30	
Faculty Signature		

