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**Part-VI
Inheritance**

Practical No: 25

AIM: Create a base class called shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called triangle and rectangle from the base shape. Add to the base class, a member function get_data() to initialize base class data members and another member function display_area() to compute and display the area of figures.

Solution

Practical25.java

```
package com.jayshil.javaapp;

class Shape{
    double dimension_1 = 15.5,dimension_2 = 12.2;
    void get_data(){

    }
    void display_area(){

    }
}

class Triangle extends Shape{
    @Override
    void display_area() {
        double area = 0.5*dimension_1*dimension_2;
        System.out.println("Area of triangle is : "+area);
    }
}

class Rectangle extends Shape{
    @Override
    void display_area() {
        double area = dimension_1*dimension_2;
        System.out.println("Area of rectangle is : "+area);
    }
}
```



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```
public class Practical25 {  
    public static void main(String[] args) {  
        Rectangle obj_0 = new Rectangle();  
        obj_0.display_area();  
        Triangle obj_1 = new Triangle();  
        obj_1.display_area();  
    }  
}
```

Output

```
Run: Practical25 x  
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\intelliJ\IntelliJ IDEA Community Edition"  
Area of rectangle is : 189.1  
Area of triangle is : 94.55  
Process finished with exit code 0  
Build completed successfully in 1 sec, 659 ms (a minute ago)
```



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Practical No: 26

AIM: Override the method 'area()', in the class 'Figure' for the following geometric shapes triangle and square.

Solution

Practical26.java

```
package com.jayshil.javaapp;

class Figure{
    double dimension_1 = 5.0 , dimension_2 = 7.0;
    void area()
    {
        System.out.println("No object created");
    }
}

class triangle extends Figure{
    double area = 0.5*dimension_1*dimension_2;

    @Override
    void area() {
        System.out.println("Area of triangle is : "+area);
    }
}

class square extends Figure{
    double area = dimension_1*dimension_1;

    @Override
    void area() {
        System.out.println("Area of square is : "+area);
    }
}

public class Practical26 {
    public static void main(String[] args) {
        triangle triobj = new triangle();
        triobj.area();

        square sqobj = new square();
        sqobj.area();
    }
}
```



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Output

```
Run: Practical26 x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\intelliJ\IntelliJ
Area of triangle is : 17.5
Area of square is : 25.0
Process finished with exit code 0
Build completed successfully in 1 sec, 726 ms (a minute ago)
```



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Practical No: 27

AIM: Use the concept of abstract classes, where the method area() is declared as abstract in the class 'Figure'.

Solution

Practical27.java

```
package com.jayshil.javaapp;

abstract class Figures{
    abstract void area(double dimension_1);
}

class subclass extends Figures{
    @Override
    void area(double dimension_1) {
        double area = dimension_1*dimension_1;
        System.out.println("The area of Square is : "+area);
    }
}

public class Practical27 {
    public static void main(String[] args) {
        subclass subobj = new subclass();
        subobj.area(4.0);
    }
}
```



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Output

```
Run: Practical27 x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java
The area of Square is : 16.0
Process finished with exit code 0
Build completed successfully in 1 sec, 687 ms (a minute ago)
```



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Practical No: 28

AIM: Create a program with an abstract class named 'Test'. Which contains two methods named 'callme()' and 'callmetoo()'. Declare the method 'callme' as abstract and let the methods 'callmetoo()' have a body that is a simple message. Derive a subclass 'Test2' from the abstract class 'Test' which implements the methods 'callme()'. Let the object of the subclass 'Test2' calls the two methods. Analyse which version of the method 'callme()' is executed.

Solution

Practica28.java

```
package com.jayshil.javaapp;

abstract class Test{
    abstract void callme();
    void callmetoo(){
        System.out.println("Callmetoo from Test class");
    }
}

class Test2 extends Test{
    @Override
    void callme() {
        System.out.println("Callme from Test2 class");
    }
}

public class Practical28 {
    public static void main(String[] args) {
        Test2 obj1 = new Test2();
        obj1.callme();
        obj1.callmetoo();
    }
}
```



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Output

```
Run: Practical28 x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\intellij\IntelliJ
Callme from Test2 class
Callmetoo from Test class
Process finished with exit code 0
Build completed successfully in 1 sec, 485 ms (moments ago)
```




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Practical No: 29

AIM: Write a java program which explains the concept of super keyword.

Solution

Practica29.java

```
package com.jayshil.javaapp;

class Animals{
    String name = "This is a dog";
}
class pet extends Animals{
    String name = "This is a cat";
    void type_of_pet()
    {
        System.out.println("Without super keyword : "+name);
        System.out.println("With super keyword : "+super.name);
    }
}

public class Practical29 {
    public static void main(String[] args) {
        pet obj = new pet();
        obj.type_of_pet();
    }
}
```

Output

```
Run: Practical29 x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\intellij\IntelliJ IDEA Commu
Without super keyword : This is a cat
With super keyword : This is a dog
Process finished with exit code 0
Run TODO Problems Terminal Build
All files are up-to-date (a minute ago)
```



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Practical No: 30

AIM: Write a program to do the find out the average of 4 different variables which has been declared and initialized in separate class. Using multilevel inheritance.

Solution

Practica30.java

```
package com.jayshil.javaapp;

class firstclass{
    int first_var = 4;
}

class secondclass extends firstclass{
    int second_var = 8;
}

class third_class extends secondclass{
    int third_var = 2;
}

class fourth_class extends third_class{
    int fourth_var = 10;
}

public class Practical30 {
    public static void main(String[] args) {
        fourth_class obj = new fourth_class();
        int average = (obj.first_var+obj.second_var+
obj.third_var+obj.fourth_var)/4;
        System.out.println("The average of numbers is :
"+average);
    }
}
```



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Output

```
Run: Practical30 x
D:\softwares\Java\bin\java.exe "-javaagent:D:\softwares\Java\intellij\I
The average of numbers is : 6

Process finished with exit code 0

Run TODO Problems Terminal Build
Build completed successfully in 1 sec, 621 ms (a minute ago)
```