LAB 4 AND 5 EXTRA PROGRAMS

1.

```java
import java.io.*;

import java.util.*;

abstract class Solid

{

double d1,d2,d3;

Solid()

{

}

abstract void surface_area();

abstract void volume();

}

class Cylinder extends Solid

{

Cylinder(double a,double b)

{

d1=a;

d2=b;

}

void surface_area()

{

System.out.println("Surface Area is:"+((2*3.14*d1*d1)+(2*3.14*d1*d2)));

}

void volume()
```

```java
{

System.out.println("Volume is:"+(3.14*d1*d1*d2));

}

}

class Cone extends Solid

{

Cone(double a,double b,double c)

{

d1=a;

d2=b;

d3=c;

}

void surface_area()

{

System.out.println("Surface Area is:"+((3.14*d1*d1)+(3.14*d1*d2)));

}

void volume()

{

System.out.println("Volume is:"+((3.14*d1*d1*d3)/3.0));

}


}

class Sphere extends Solid

{

Sphere(double a)
```

```java
{
d1=a;
}
void surface_area()
{
System.out.println("Surface Area is:"+(4*3.14*d1*d1));
}
void volume()
{
System.out.println("Volume is:"+((4*3.14*d1*d1*d1)/3));
}
}
class Solid_test
{
public static void main(String args[])
{
Cylinder c=new Cylinder(1,2);
Cone c1=new Cone(1,2,3);
Sphere s1=new Sphere(2);
c.surface_area();
c.volume();
c1.surface_area();
c1.volume();
s1.surface_area();
s1.volume();
```

```
}

}
```



```
C:\Users\admin\Documents>java Solid_test
Surface Area is:18.84
Volume is:6.28
Surface Area is:9.42
Volume is:3.14
Surface Area is:50.24
Volume is:33.49333333333333
```

2.

import java.io.*;

import java.util.*;

class Person

{

String name;

Person(String name)

{

this.name=name;

System.out.println("**************************");**

System.out.println("Name:"+name);

}

}

class Employee extends Person

```java
{String designation;

Employee(String name,String designation)

{

super(name);

this.designation=designation;

System.out.println("Designation:"+designation);

}


}
class Student extends Person

{

        String designation;

Student(String name,String designation)

{

super(name);

this.designation=designation;

System.out.println("Designation:"+designation);

}


}
```

```java
class teaching extends Employee
{String emptype;
teaching(String name,String designation,String emptype)
{
super(name,designation);
this.emptype=emptype;
System.out.println("Emptype:"+emptype);
}


}
class non_teaching extends Employee
{String emptype;
non_teaching(String name,String designation,String emptype)
{
super(name,designation);
this.emptype=emptype;
System.out.println("Emptype:"+emptype);
}


}
```

```java
class ug extends Student

{String course;

ug(String name,String designation,String course)

{

super(name,designation);

this.course=course;

System.out.println("Course:"+course);

}


}
class pg extends Student

{

        String course;

pg(String name,String designation,String course)

{

super(name,designation);

this.course=course;

System.out.println("Course:"+course);

}
```

```
}
class test_hierarchy
{
public static void main(String args[])
{
Scanner sc=new Scanner(System.in);
teaching t1=new teaching("Sharat","Employee","teaching");
non_teaching t2=new non_teaching("Ravi","Employee","non teaching");
ug u1=new ug("Vamsi","Student","ug");
pg p1=new pg("Pankaj","Student","pg");


}
}
```

```
C:\Users\admin\Documents>java test_hierarchy
*********************************
Name:Sharat
Designation:Employee
Emptype:teaching
*********************************
Name:Ravi
Designation:Employee
Emptype:non teaching
*********************************
Name:Vamsi
Designation:Student
Course:ug
*********************************
Name:Pankaj
Designation:Student
Course:pg
```