

JAVA LAB EX 4

-19BCE1709 AISHWARYA S

1. Inheritance and Polymorphism

CODE:

```
import java.util.*;
import java.lang.*;
class advertcamp
{
    int cps=5000; //cost per second
    int cpc=1000; //cost per column
    int cpa=1000; //cost per area
    int cpd=500000; //cost per day
    double cost(double p, int flag)
    {
        return 0;
    }
}

class hoarding extends advertcamp
{
    double cost(double p, int flag)
    {
        double c;
        if(flag==1)
            c= ((advertcamp) this).cpd*p;
        else
        {
            c= ((advertcamp) this).cpd*p;
            c=c+.5*c;
        }
        return c;
    }
}
```

```

class poster extends advertcamp
{ double cost(double p, int flag) //flag in this case is the number of
copies
{ double c;
  c= ((advertcamp) this).cpa*p*flag; // cost per copy = area* cost per
area
  return c;
}

}

class newspaperad extends advertcamp
{ double cost(double p, int flag)
{ double c;
  c= ((advertcamp) this).cpc*p;
  return c;
}

}

class tvad extends advertcamp
{ double cost(double p, int flag)
{ double c;
  if(flag==1)
    c= ((advertcamp) this).cps*p;
  else
    { c=((advertcamp) this).cps*p*2;
    }
  return c;
}

}

class lab41
{ public static void main(String[] args)
{System.out.print("Aishwarya S 19BCE1709\n");
Scanner sc= new Scanner(System.in);
int choice,f;
double c=0,p;
advertcamp a;
while(true)
{ System.out.print("Enter your choice: 1 for hoarding, 2 for poster, 3 for
newspaper, 4 for tv ad\n");
choice= sc.nextInt();

```

```

if(choice==1)
{
    a=new hoarding();
    System.out.print("Enter the number of days: ");
    p= sc.nextDouble();
    System.out.print("Is it a prime location? (1 for no) ");
    f=sc.nextInt();
    c= a.cost(p,f);
    System.out.print("Cost for hoarding advert: "+c+"\n");

}
else if (choice==2)
{
    a=new poster();
    double l,b;
    System.out.print("Enter the length: ");
    l= sc.nextDouble();
    System.out.print("Enter the breadth: ");
    b=sc.nextDouble();
    p=l*b;
    System.out.print("Enter number of copies: ");
    f=sc.nextInt();
    c= a.cost(p,f);
    System.out.print("Cost for poster advert: "+c+"\n");
}
else if(choice==3)
{
    System.out.print("Enter the number of cols: ");
    p= sc.nextDouble();
    a=new newspaperad();
    c=a.cost(p,1);
    System.out.print("Cost for newspaper advert: "+c+"\n");
}
else if(choice==4)
{
    a=new tvad();
    System.out.print("Enter the number of seconds: ");
    p= sc.nextDouble();
    System.out.print("Peak hours? (1 for no) ");
    f=sc.nextInt();

    c=a.cost(p,f);
    System.out.print("Cost for tv advert: "+c+"\n");
}
else
{
    System.out.print("Invalid Choice\n");
}
}

```

```

System.out.print("Do you want to continue: 1 for no ");
int n= sc.nextInt();
if(n==1)
{break;}

}

}

}

```

OUTPUT:

TEST CASE 1:

```

aishwarya@Aishwaryas-MacBook-Pro 19bce1709java % javac lab41.java
aishwarya@Aishwaryas-MacBook-Pro 19bce1709java % java lab41
Aishwarya S 19BCE1709
Enter your choice: 1 for hoarding, 2 for poster, 3 for newspaper, 4 for tv ad
1
Enter the number of days: 4
Is it a prime location? (1 for no) 1
Cost for hoarding advert: 2000000.0
Do you want to continue: 1 for no 2
Enter your choice: 1 for hoarding, 2 for poster, 3 for newspaper, 4 for tv ad
2
Enter the length: 5
Enter the breadth: 4
Enter number of copies: 100
Cost for poster advert: 2000000.0
Do you want to continue: 1 for no 2
Enter your choice: 1 for hoarding, 2 for poster, 3 for newspaper, 4 for tv ad
3
Enter the number of cols: 4
Cost for newspaper advert: 4000.0
Do you want to continue: 1 for no 2
Enter your choice: 1 for hoarding, 2 for poster, 3 for newspaper, 4 for tv ad
4
Enter the number of seconds: 10
Peak hours? (1 for no) 1
Cost for tv advert: 50000.0
Do you want to continue: 1 for no 1
aishwarya@Aishwaryas-MacBook-Pro 19bce1709java % █

```

TEST CASE 2:

```

[aishwarya@Aishwaryas-MacBook-Pro 19bce1709]java % javac lab41.java
[aishwarya@Aishwaryas-MacBook-Pro 19bce1709]java % java lab41
Aishwarya S 19BCE1709
Enter your choice: 1 for hoarding, 2 for poster, 3 for newspaper, 4 for tv ad
1
Enter the number of days: 4
Is it a prime location? (1 for no) 2
Cost for hoarding advert: 3000000.0
Do you want to continue: 1 for no 2
Enter your choice: 1 for hoarding, 2 for poster, 3 for newspaper, 4 for tv ad
2
Enter the length: 4
Enter the breadth: 4
Enter number of copies: 100
Cost for poster advert: 1600000.0
Do you want to continue: 1 for no 2
Enter your choice: 1 for hoarding, 2 for poster, 3 for newspaper, 4 for tv ad
3
Enter the number of cols: 2
Cost for newspaper advert: 2000.0
Do you want to continue: 1 for no 2
Enter your choice: 1 for hoarding, 2 for poster, 3 for newspaper, 4 for tv ad
4
Enter the number of seconds: 10
Peak hours? (1 for no) 2
Cost for tv advert: 100000.0
Do you want to continue: 1 for no 2
Enter your choice: 1 for hoarding, 2 for poster, 3 for newspaper, 4 for tv ad

```

2. Abstract Class and Abstract Methods

CODE:

```

import java.util.*;
import java.lang.*;
abstract class themepark
{
    double a=500,c=300;

    double calculate(int m,int n)
    { return 0;}
    abstract void playgame();
}

class wonderla extends themepark
{
    int[] w = new int[40];
    double calculate(int m,int n)
    { double c;
    c=n*((themepark)this).a+ m*((themepark)this).c;
    return c;
}

```

```

    }

    void playgame()
    { Scanner sc= new Scanner(System.in);
    int op,f;
        while(true)
    { System.out.print("Enter the code of the game you want to play: ");
        op=sc.nextInt();
        if(op<40)
            {w[op]=w[op]+1;}
            else
            {
                System.out.print("Illegal code\n");
            }
            System.out.print("Do you want to continue? 1 for yes ");
            f=sc.nextInt();
            if(f!=1)
                break;
        }

    int rep=0,np=0;
    for(int i=0;i<40;i++)
    { if(w[i]>1)
        rep++;
        if(w[i]==0)
            np++;
        }
        System.out.print("The number of games played more than once: "+rep);
        System.out.print("\nThe number of games that were never played:
        "+np+"\n");
    }

}

}

class queensland extends themepark
{ boolean [] q = new boolean[30];
    double calculate(int m,int n)
    { double c;
        c=n*((themepark)this).a+ m*((themepark)this).c;
        return c;
    }
}

```

```

        void playgame()
    {
        Scanner sc= new Scanner(System.in);
        int op, f;
        while(true)
        {
            System.out.print("Enter the code of the game you want to play: ");
            op=sc.nextInt();
            if(op<40)
            {
                if(q[op]==false)
                {
                    q[op]=true;
                }

                else
                {
                    System.out.print("Warning. You have already played this
game\n");
                }
            }
            else
            {
                System.out.print("Illegal code\n");
            }
            System.out.print("Do you want to continue? 1 for yes ");
            f=sc.nextInt();
            if(f!=1)
            {
                break;
            }
        }
    }

}

class java42
{
    public static void main(String[] args)
    {
        System.out.print("Aishwarya S 19BCE1709\n");
        Scanner s= new Scanner(System.in);
        themepark th= new wonderla();
        themepark th1=new queensland();
        System.out.print("Enter the number of adults: ");
        int n= s.nextInt();
        System.out.print("Enter the number of children: ");
        int m=s.nextInt();
        System.out.print("Enter your choice. Wonderla(1) Queensland(2): ");
        int ch=s.nextInt();
        if(ch==1)
        {
            System.out.print("Enter fee is: ");
        }
    }
}

```

```

        double c=th.calculate(m,n);
        System.out.print(c+"\n");
        th.playgame();
    }
    else if(ch==2)
    { System.out.print("Enter fee is: ");
        double c=th1.calculate(m,n);
        System.out.print(c+"\n");
        th1.playgame();

    }
    else
    { System.out.print("Wrong choice\n");
    }

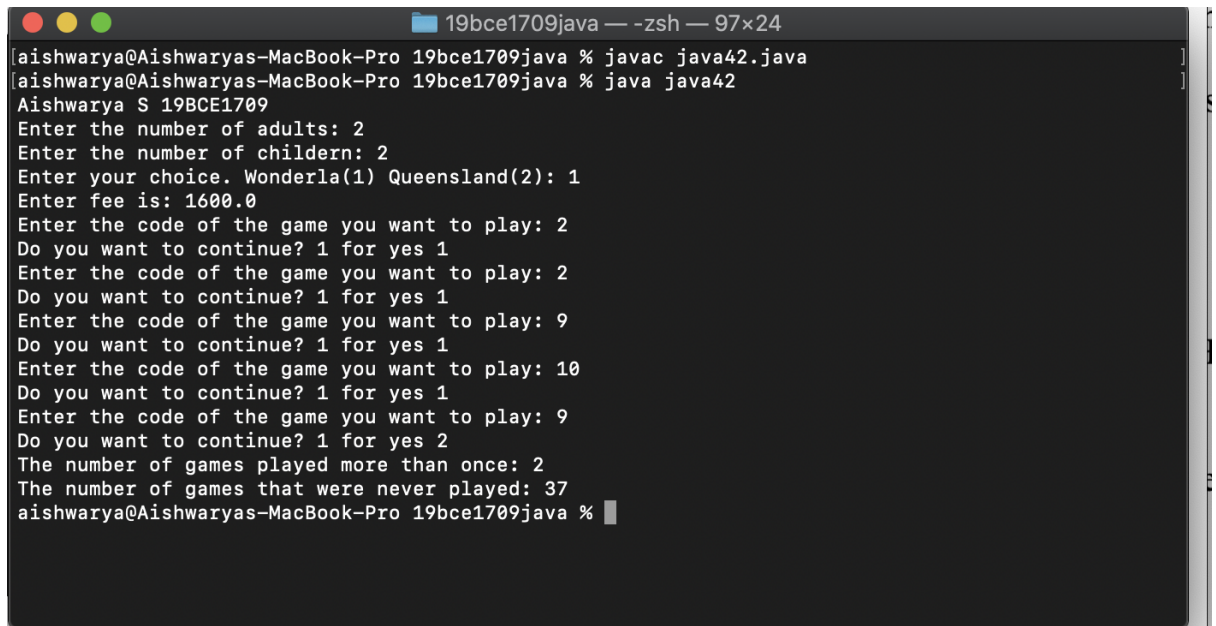
}
}

```

OUTPUT:

TEST CASE 1:

2,9 are the games that were repeated. 10 was only played once. Total number of games that were never played =37.

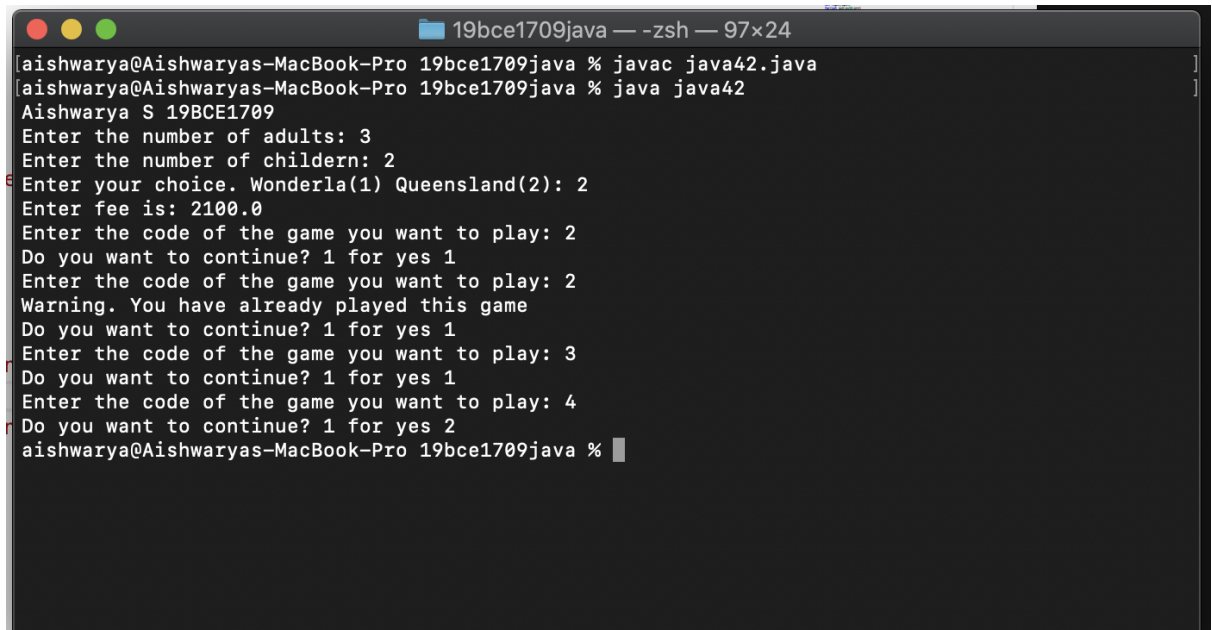


```

19bce1709java — zsh — 97x24
[aishwarya@Aishwaryas-MacBook-Pro 19bce1709java % javac java42.java
[aishwarya@Aishwaryas-MacBook-Pro 19bce1709java % java java42
Aishwarya S 19BCE1709
Enter the number of adults: 2
Enter the number of children: 2
Enter your choice. Wonderla(1) Queensland(2): 1
Enter fee is: 1600.0
Enter the code of the game you want to play: 2
Do you want to continue? 1 for yes 1
Enter the code of the game you want to play: 2
Do you want to continue? 1 for yes 1
Enter the code of the game you want to play: 9
Do you want to continue? 1 for yes 1
Enter the code of the game you want to play: 10
Do you want to continue? 1 for yes 1
Enter the code of the game you want to play: 9
Do you want to continue? 1 for yes 2
The number of games played more than once: 2
The number of games that were never played: 37
aishwarya@Aishwaryas-MacBook-Pro 19bce1709java %

```


TEST CASE 2:



```
19bce1709java — zsh — 97x24
aishwarya@Aishwaryas-MacBook-Pro 19bce1709java % javac java42.java
aishwarya@Aishwaryas-MacBook-Pro 19bce1709java % java java42
Aishwarya S 19BCE1709
Enter the number of adults: 3
Enter the number of children: 2
Enter your choice. Wonderla(1) Queensland(2): 2
Enter fee is: 2100.0
Enter the code of the game you want to play: 2
Do you want to continue? 1 for yes 1
Enter the code of the game you want to play: 2
Warning. You have already played this game
Do you want to continue? 1 for yes 1
Enter the code of the game you want to play: 3
Do you want to continue? 1 for yes 1
Enter the code of the game you want to play: 4
Do you want to continue? 1 for yes 2
aishwarya@Aishwaryas-MacBook-Pro 19bce1709java %
```

3. Interfaces

CODE:

```
import java.util.*;
import java.lang.*;
import java.text.DecimalFormat;
interface shape3d
{
    double getvolume();
}
class cuboid implements shape3d
{ double l,b,h;

    public double getvolume()
    { double v=l*b*h;
      return v;
    }
    cuboid(double l,double b, double h)
    { this.l=l;
      this.b=b;
      this.h=h;
    }
}
```

```

interface solid3d extends shape3d
{
    double getdensity();
    double getmass();
}

class solidcuboid extends cuboid implements solid3d
{
    double density;
    solidcuboid(double l, double b, double h)
    { super(l,b,h);
      this.density=1;
    }

    solidcuboid(double l,double b,double h, double d)
    { super(l,b,h);
      this.density=d;
    }

    public double getdensity()
    { return density;}
    public double getmass()
    { double m= super.getvolume()*getdensity();
      return m;
    }
}

```

```

class java43
{ public static void main(String[] args)
  { System.out.print("19BCE1709 AISHWARYA S\n");
    DecimalFormat f = new DecimalFormat("#.####");
    Scanner s= new Scanner(System.in);
    System.out.print("\nTest case 1\n");
    System.out.print("Enter length: ");
    double l=s.nextDouble();
    System.out.print("Enter breadth: ");
    double b=s.nextDouble();
    System.out.print("Enter height: ");
    double h=s.nextDouble();
    System.out.print("Enter density: ");
  }
}

```

```
double d=s.nextDouble();
```

```
solidcuboid sc= new solidcuboid(l,b,h,d);  
System.out.print("Volume:"+f.format(sc.getvolume())+"\n");  
System.out.print("Mass:"+f.format(sc.getmass())+"\n");
```

```
System.out.print("\nTest case 2\n");  
System.out.print("Enter length: ");  
l=s.nextDouble();  
System.out.print("Enter breadth: ");  
b=s.nextDouble();  
System.out.print("Enter height: ");  
h=s.nextDouble();  
solidcuboid ss= new solidcuboid(l,b,h);  
  
System.out.print("Volume:"+f.format(ss.getvolume())+"\n");  
System.out.print("Mass:"+f.format(ss.getmass())+"\n");
```

```
}
```

```
}
```

OUTPUT:

```
19bce1709java — -zsh — 80x24
[aishwarya@Aishwaryas-MacBook-Pro 19bce1709java % javac java43.java ]
[aishwarya@Aishwaryas-MacBook-Pro 19bce1709java % java java43 ]
19BCE1709 AISHWARYA S

Test case 1
Enter length: 3.1
Enter breadth: 3.2
Enter height: 4.5
Enter density: 5.78
Volume:44.64
Mass:258.0192

Test case 2
Enter length: 5.1
Enter breadth: 3.98
Enter height: 2.23
Volume:45.2645
Mass:45.2645
aishwarya@Aishwaryas-MacBook-Pro 19bce1709java %
```