

JAVA LAB

WEEK 1:

AIM: Accept two strings from the user and print it on console with concatenation of "and" in the middle of the strings.

a)Command line:

Program:

```
class Twostrings
{
    public static void main(String args[])
    {
        String a=args[0];
        String b=args[1];
        System.out.println("2 arguments are "+a+" and "+b);
    }
}
```

Output:

```
E:\books and pdfs\sem4 pdfs\java lab\week1>javac Twostrings.java

E:\books and pdfs\sem4 pdfs\java lab\week1>java Twostrings.java hello world
2 arguments are hello and world

E:\books and pdfs\sem4 pdfs\java lab\week1>
```

b)scanner class

```
import java.util.Scanner;
class Twostrings_scanner
{
    public static void main(String args[])
    {
        Scanner sc=new Scanner(System.in);
        String a=sc.nextLine();
        String b=sc.nextLine();
        sc.close();
        System.out.println("2 strings are "+a+" and "+b);
    }
}
```

Output:

```
E:\books and pdfs\sem4 pdfs\java lab\week1>javac Twostings_scanner.java

E:\books and pdfs\sem4 pdfs\java lab\week1>java Twostings_scanner.java
hello world!
welcome to the world of java
2 strings are hello world! and welcome to the world of java
```

AIM:

Accept 12-hour time zone and convert into its corresponding 24-hour time zone. Note: Accept hours, minutes and seconds separately from the user (e.g. 07 05 45 PM should be displayed as 19:05:45)

a)Command line:

Program:

```
class Time_conversion{
    public static void main(String args[]){
        int hr=Integer.parseInt(args[0]);
        int min=Integer.parseInt(args[1]);
        int sec=Integer.parseInt(args[2]);
        String ampm=args[3];
        if((ampm.equals("pm")||ampm.equals("PM")) && hr<12)
        {
            hr=hr+12;
        }
        if((ampm.equals("pm")||ampm.equals("PM")) && hr==12)
        {
            hr=0;
        }

        System.out.printf("time in 24 hrs is
"+String.format("%02d:%02d:%02d",hr,min,sec));
    }
}
```

```
E:\books and pdfs\sem4 pdfs\java lab\week1>javac Time_conversion.java
E:\books and pdfs\sem4 pdfs\java lab\week1>java Time_conversion.java 5 6 7 pm
time in 24 hrs is 17:06:07
E:\books and pdfs\sem4 pdfs\java lab\week1>
```

b)Scanner class

```
import java.util.*;
class Time_conversion_sc{
    public static void main(String args[]){
        Scanner sc=new Scanner(System.in);
        int hr=sc.nextInt();
        int min=sc.nextInt();
        int sec=sc.nextInt();
        String ampm=sc.next();
        if((ampm.equals("pm")||ampm.equals("PM")) && hr<12)
        {
            hr=hr+12;
        }
        if((ampm.equals("pm")||ampm.equals("PM")) && hr==12)
        {
            hr=0;
        }

        System.out.printf("time in 24 hrs is %02d: %02d : %02d
",hr,min,sec);
        System.out.println();
        System.out.format("time in 24 hrs is %02d: %02d : %02d
",hr,min,sec);
        System.out.println();
        System.out.printf("time in 24 hrs is
"+String.format("%02d:%02d:%02d",hr,min,sec));
    }
}
```

Output:

```
E:\books and pdfs\sem4 pdfs\java lab\week1>javac Time_conversion_sc.java
E:\books and pdfs\sem4 pdfs\java lab\week1>java Time_conversion_sc.java
4
12
55
pm
time in 24 hrs is 16:12:55
E:\books and pdfs\sem4 pdfs\java lab\week1>
```

Aim:

Accept a number „n” and print the list of „n” Fibonacci terms recursively.

a)command line:**Program:**

```
class Fibrec{
    protected static int fibb(int a){
        if(a==1||a==0)
            return 1;
        else
            return fibb(a-1)+fibb(a-2);
    }
    public static void main(String args[])
    {
        int a=Integer.parseInt(args[0]);
        for(int i=0;i<a;i++){
            System.out.println(fibb(i)+" is "+(i+1)+" th term fibb series");
        }
    }
}
```

Output:

```
E:\books and pdfs\sem4 pdfs\java lab\week1>javac Fibrec.java

E:\books and pdfs\sem4 pdfs\java lab\week1>java Fibrec.java 10
1 is 1 th term fibb series
1 is 2 th term fibb series
2 is 3 th term fibb series
3 is 4 th term fibb series
5 is 5 th term fibb series
8 is 6 th term fibb series
13 is 7 th term fibb series
21 is 8 th term fibb series
34 is 9 th term fibb series
55 is 10 th term fibb series
```

b)scanner

```
import java.util.*;
class Fibbrec_sc{
    private static int fibbrec(int a){
        if(a==1||a==0)
            return 1;
        else
            return fibbrec(a-1)+fibbrec(a-2);
    }
    public static void main(String args[])
    {
        Scanner sc=new Scanner(System.in);
        int a=sc.nextInt();
        for(int i=0;i<a;i++){
            System.out.println(fibbrec(i)+" is "+(i+1)+" th term fibb series");
        }
    }
}
```

Output:

```
E:\books and pdfs\sem4 pdfs\java lab\week1>javac Fibbrec_sc.java
E:\books and pdfs\sem4 pdfs\java lab\week1>java Fibbrec_sc.java
10
1 is 1 th term fibb series
1 is 2 th term fibb series
2 is 3 th term fibb series
3 is 4 th term fibb series
5 is 5 th term fibb series
8 is 6 th term fibb series
13 is 7 th term fibb series
21 is 8 th term fibb series
34 is 9 th term fibb series
55 is 10 th term fibb series
```

WEEK 2:

1)AIM:

Write a program that accepts the set of inputs from the user of various integer data types and determines the primitive data type that is capable of properly storing that input.

PROGRAM:

```
import java.util.*;
import java.io.*;
public class Integer_data_types
{
    public static void main(String... arg)
    {
        int n;
        Scanner sc=new Scanner(System.in);
        n=sc.nextInt();
        for(int i=0;i<n;i++)
        {
            try{
                long num=sc.nextLong();
                if(num>=-127 && num<128){
                    System.out.println("BYTE");
                }
            }
        }
    }
}
```

```
    }
    if(num>Short.MIN_VALUE && num<Short.MAX_VALUE)
    {
        System.out.println("SHORT");
    }
    if(num >= Integer.MIN_VALUE && num <= Integer.MAX_VALUE)
        System.out.println("*int");
    if(num >= Long.MIN_VALUE && num <= Long.MAX_VALUE)
        System.out.println("*long");
    }
    catch(Exception e){
        System.out.println("No integer datatype suits the input");
    }
}
}
```

```
E:\books and pdfs\sem4 pdfs\java lab\week2>javac Integer_data_types.java

E:\books and pdfs\sem4 pdfs\java lab\week2>java Integer_data_types.java
6
123
BYTE
1354
SHORT
235436536
*int
235436536655658
*long
343
SHORT
23423
SHORT
```

2)AIM:

Write a program that accepts an array of integers and print those which are both odd and prime. If no such element in that array print "Not found".

PROGRAM:

```
import java.util.Scanner;
class Oddprime{
```

```
public static int prime(int n){
    int i;
    for(i=2;i<=n/2;i++)
    {
        if(n%i==0)
            return 0;
    }
    return 1;
}
public static void main(String args[])
{
    int i,n;
    Scanner sc=new Scanner(System.in);
    n=sc.nextInt();
    int arr[]=new int[n];
    for(i=0;i<n;i++){
        arr[i]=sc.nextInt();
        if(arr[i]%2!=0){
            int p=prime(arr[i]);

        }
    }
    System.out.println("ODD Prime numbers are ");
    for(i=0;i<n;i++){

        if(arr[i]%2!=0){
            int p=prime(arr[i]);
            if(p==1)
            {
                System.out.print(arr[i]+" ");
            }
        }
    }
}
```

OUTPUT:


```
E:\books and pdfs\sem4 pdfs\java lab\week2>javac Oddprime.java
E:\books and pdfs\sem4 pdfs\java lab\week2>java Oddprime.java
5
41 45 55 11 81
ODD Prime numbers are
41 11
E:\books and pdfs\sem4 pdfs\java lab\week2>
```

3)AIM:

Write a program to accept contents into an Integer Array and print the frequency of each number in the order of their number of occurrences.

PROGRAM:

```
import java.util.Scanner;
class Frequency {
    public static void main(String[] args) {
        //Initialize array
        int n;
        Scanner sc=new Scanner(System.in);
        n=sc.nextInt();
        int arr[] = new int[n];
        for(int i=0;i<n;i++)
            arr[i]=sc.nextInt();
        //Array fr will store frequencies of element
        int [] fr = new int [n];
        int visited = -1;
        for(int i = 0; i < arr.length; i++){
            int count = 1;
            for(int j = i+1; j < arr.length; j++){
                if(arr[i] == arr[j]){
                    count++;//4
                    //To avoid counting same element again
                    fr[j] = visited;
                }
            }
            if(fr[i] != visited)
                fr[i] = count;
        }
        int i,j;
        for(i=0;i<arr.length;i++)
        {
            for(j=i+1;j<arr.length;j++)
```

```
{
    if(fr[i]>fr[j])
    {
        fr[i]=fr[i]+fr[j];
        fr[j]=fr[i]-fr[j];
        fr[i]=fr[i]-fr[j];

        arr[i]=arr[i]+arr[j];
        arr[j]=arr[i]-arr[j];
        arr[i]=arr[i]-arr[j];
    }
}

//Displays the frequency of each element present in array
System.out.println("-----");
System.out.println(" Element | Frequency");
System.out.println("-----");
for(i = 0; i < fr.length; i++){
    if(fr[i] != visited)
        System.out.println("    " + arr[i] + "    |    " + fr[i]);
}
System.out.println("-----");
}
```

```
E:\books and pdfs\sem4 pdfs\java lab\week2>java Frequency.java
```

```
10
```

```
23 42 22 23 33 42 22 22 10 10
```

```
-----
Element | Frequency
-----
```

33		1
23		2
10		2
42		2
22		3

```
-----
```

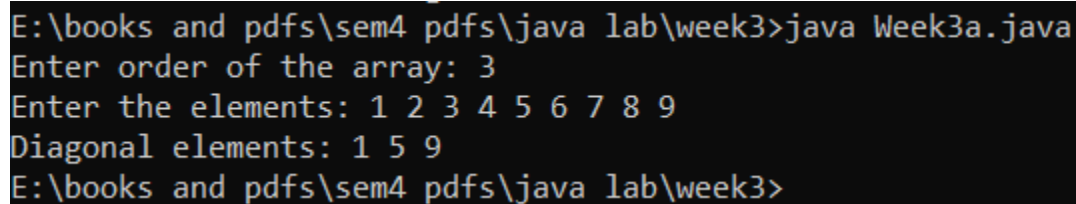
WEEK 3:

1)AIM:

Write a program that accepts an „n“ ordered square matrix elements into a single dimension array and print the elements of leading diagonal (top left to bottom right).

Program:

```
import java.util.*;
public class Week3a
{
    public static void main(String... s)
    {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter order of the array: ");
        int d = sc.nextInt();
        int[] mat = new int[d*d];
        System.out.print("Enter the elements: ");
        for(int i=0;i<d*d;i++)
            mat[i] = sc.nextInt();
        System.out.print("Diagonal elements: ");
        for(int j=0;j<d;j++)
            System.out.print(mat[j*(d+1)]+" ");
    }
}
```



```
E:\books and pdfs\sem4 pdfs\java lab\week3>java Week3a.java
Enter order of the array: 3
Enter the elements: 1 2 3 4 5 6 7 8 9
Diagonal elements: 1 5 9
E:\books and pdfs\sem4 pdfs\java lab\week3>
```

2)Write a program that accepts an „m x n“ double dimension array, where „m“ represents financial years and „n“ represents Ids of the items sold. Each element in the array represents the number of items sold in a particular year. Identify the year and id of the item which has more demand.

Program:

```
import java.util.Scanner;
class Week3_b{
    public static void main(String... arg){
        Scanner sc=new Scanner(System.in);
        int m=sc.nextInt();
        int n=sc.nextInt();
        int years[]=new int[m];
        int itemid[]=new int[n];
        System.out.println("enter the years");
        for(int i=0;i<m;i++){
            years[i]=sc.nextInt();
        }
        System.out.println("enter the years");
        for(int i=0;i<n;i++){
            itemid[i]=sc.nextInt();
        }
        int arr[][]=new int[2022][2022];
        System.out.println("enter the no of items sold");
        for(int i:years){
            for(int j:itemid){
                arr[i][j]=sc.nextInt();
            }
        }
        int mdemand=arr[m-1][n-1];
        int dyear=years[m-1];
        int did=itemid[n-1];
        for(int i:years){
            for(int j:itemid){
                if(arr[i][j]>mdemand){
                    mdemand=arr[i][j];
                    dyear=i;
                    did=j;
                }
            }
        }
        System.out.println("Item id "+did+" has max demand of "+mdemand+"
in year "+dyear);
    }
}
```

Output:

```
E:\books and pdfs\sem4 pdfs\java lab\week3>java Week3_b.java
5 5
enter the years
2016 2017 2018 2019 2020
enter the years
1000 1001 1002 1003 1004
enter the no of items sold
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Item id 1004 has max demand of 25 in year 2020

E:\books and pdfs\sem4 pdfs\java lab\week3>
```

3)AIM:

Write a program that accepts an „n” ordered square matrix and calculate the absolute difference between the sums of elements in their diagonals.

Program:

```
import java.util.Scanner;
class Absdiff{
    public static void main(String... arg){
        int n,m,i,j;
        Scanner sc=new Scanner(System.in);
        n=sc.nextInt();
        m=sc.nextInt();
        int arr[][]=new int[n][m];
        for(i=0;i<n;i++)
        {
            for(j=0;j<m;j++)
            {
                arr[i][j]=sc.nextInt();
            }
        }
        int sum1=0,sum2=0;
        for(i=0;i<n;i++){
            for(j=0;j<m;j++)
            {
```

```
        if(i==j)
        {
            sum1+=arr[i][j];
        }
        if((i+j)==n-1)
        {
            sum2+=arr[i][j];
        }
    }
}
System.out.println("diagonal sums are "+sum1+" "+sum2);
if((sum1-sum2)>0){
    System.out.println(sum1-sum2);
}
else
    System.out.println("difference is "+(sum2-sum1));
}
```

Output:

```
E:\books and pdfs\sem4 pdfs\java lab\week3>javac Absdiff.java
E:\books and pdfs\sem4 pdfs\java lab\week3>java Absdiff.java
3 3
1 2 3 4 5 6 7 8 9
diagonal sums are 15 15
difference is 0
```

WEEK 4:

- 1) **AIM:** Create a class Box that uses a parameterized constructor to initialize the dimensions of a box. The dimensions of the Box are width, height, depth. The class should have a method that can return the volume of the box. Create an object of the Box class and test the functionality.

Program:

```
import java.util.*;
class P4_1{
    static float height,depth,width;
    P4_1(float h,float w,float d){
        height=h;
        width=w;
        depth=d;
    }
    double volume(){
        return height*width*depth;
    }
    public static void main(String... arg){
        Scanner sc=new Scanner(System.in);
        float h=sc.nextFloat();
        float w=sc.nextFloat();
        float d=sc.nextFloat();
        P4_1 ob1=new P4_1(h,w,d);
        System.out.print("Volume is "+ob1.volume());
    }
}
```

OUTPUT:

```
E:\books and pdfs\sem4 pdfs\java lab\week4>javac P4_1.java
E:\books and pdfs\sem4 pdfs\java lab\week4>java P4_1.java
12.3
5.1
10.6
Volume is 664.9380493164062
E:\books and pdfs\sem4 pdfs\java lab\week4>
```

- 2) **AIM:** Create a new class called Calculator with the following methods: o A static method called powerInt(int num1,int num2) This method should return num1 to the power num2. o A static method called powerDouble(double num1,double num2). This method should return num1 to the power num2. o Invoke both the methods and test the functionality. Also count the number of objects created.

PROGRAM:

```
import java.util.*;
class P4_2{
    public static void main(String... arg){
        float a,b;
        int c,d;
        Scanner sc=new Scanner(System.in);
        a=sc.nextFloat();
        b=sc.nextFloat();
        c=sc.nextInt();
        d=sc.nextInt();
        Calculator mycal=new Calculator();
        System.out.println("Power double function "+mycal.powerDouble(a,b));
        System.out.println("Power int function "+mycal.powerInt(c,d));
        System.out.println("Number of times object is created "+mycal.count);
    }
}
class Calculator{
    int count=1;
    Calculator(){
        ++count;
    }
    public static double powerDouble(double num1,double num2){
        return Math.pow(num1,num2);
    }
    public static int powerInt(int num1,int num2){
        double k=Math.pow(num1,num2);
        int p=1;
        for(int i=1;i<=num1;i++){
            p*=num2;
        }
    }
}
```



```
    }  
    return p;  
}  
}
```

OUTPUT:

```
E:\books and pdfs\sem4 pdfs\java lab\week4>JAVAC P4_2.java  
  
E:\books and pdfs\sem4 pdfs\java lab\week4>java P4_2.java  
1.2  
2.3  
4  
5  
Power double function 1.5209568803356843  
Power int function 625  
Number of times object is created 2
```

WEEK 5

- 1) **AIM:** Accept a String and a number n from the user. Divide the given string into substrings each of size n and sort them lexicographically.

Program:

```
import java.util.*;  
class Strdivide{  
    public static String[] Lexicographic(String ele,int n){  
        String[] arr=new String[ele.length()/n];  
        int s=0,i=0;  
        while(s<ele.length()){  
  
            String val=ele.substring(s,s+n);  
            arr[i]=val;  
            i+=1;  
            s+=n;  
        }  
        return arr;  
    }  
    public static void main(String... arg){
```

```
Scanner sc=new Scanner(System.in);
System.out.println("string:");
String ele=sc.nextLine();
System.out.println("size");
int n=sc.nextInt();
String[] arr=new String[ele.length()%n];
ele=ele.replace(" ", "");
if(ele.length()%n!=0){
    System.out.print("not possible");

}

else
{
    arr=Lexicographic(ele,n);
    Arrays.sort(arr);
    System.out.println("substrings are");
    for(String i:arr){
        System.out.print(i+" ");
    }
}
}
```

OUTPUT:

```
E:\books and pdfs\sem4 pdfs\java lab\week5>javac Strdivide.java

E:\books and pdfs\sem4 pdfs\java lab\week5>java Strdivide.java
string:
gayatri vidya parishad college of engineering autonomous
size
2
substrings are
ad au co ee eg eo fe ga id in iv ll mo ng ng no pa ri ri sh to tr us ya ya
E:\books and pdfs\sem4 pdfs\java lab\week5>
```

- 2) AIM: Accept an array of strings and display the number of vowels and consonants occurred in each string.

PROGRAM:

```
import java.util.*;
class Vowels_consonents{
    public static void vowels_con(String s){
        int s1=0,s2=0;
        int j=0,k=0;
        for(int i=0;i<s.length();i++){

            if(s.charAt(i)=='a' || s.charAt(i)=='e' || s.charAt(i)=='i' || s.charAt(i)=='o' ||
            s.charAt(i)=='u' || s.charAt(i)=='A' || s.charAt(i)=='E' || s.charAt(i)=='I' || s.c
            harAt(i)=='O' || s.charAt(i)=='U'){
                s1++;
                j++;
            }
            else{
                s2++;
                k++;
            }
        }
        System.out.println("string "+s+" number of vowels "+s1);
        System.out.println("string "+s+" number of consonents "+s2);
        System.out.println();
    }
    public static void main(String... arg){
        int n;
        Scanner sc=new Scanner(System.in);
        n=sc.nextInt();
        sc.nextLine();
        String[] arr=new String[n+1];
        System.out.println(n);

        for(int i=0;i<n;i++){
            {
                arr[i]=sc.nextLine().trim();
            }
            System.out.println(arr[0]);
            System.out.println(arr[1]);
            for(int i=0;i<n;i++){
                if(arr[i]!=""){
                    vowels_con(arr[i]);
                }
            }
        }
    }
}
```

```
}
```

OUTPUT:

```
E:\books and pdfs\sem4 pdfs\java lab\week5>javac Vowels_consonents.java
E:\books and pdfs\sem4 pdfs\java lab\week5>java Vowels_consonents.java
3
3
gayatri vidya parishad college of engineering
vizag
andhra pradesh
string gayatri vidya parishad college of engineering number of vowels 17
string gayatri vidya parishad college of engineering number of consonents 28

string vizag number of vowels 2
string vizag number of consonents 3

string andhra pradesh number of vowels 4
string andhra pradesh number of consonents 10
```

- 3) AIM: Accept two strings from the user and determine if the strings are anagrams or not.

PROGRAM:

```
import java.util.*;
public class Anagrams
{
    public static void main(String... arg){
        String s1,s2;

        Scanner sc=new Scanner(System.in);
        s1=sc.nextLine();
        s2=sc.nextLine();
        char []c1=s1.toCharArray();
        char []c2=s2.toCharArray();
        if(s1.length()!=s2.length()){
            System.out.println("Strings "+s1+" and "+s2+" are not
anagrams");
            System.exit(0);
        }
    }
}
```

```
for(int i=0;i<s1.length();i++){
    c1[i]=s1.charAt(i);
    c2[i]=s2.charAt(i);
}
Arrays.sort(c1);
Arrays.sort(c2);
int flag=1;
for(int i=0;i<s1.length();i++){
    if(c1[i]!=c2[i]){
        flag=0;
        break;
    }
}
if(flag==1){
    System.out.println("Strings "+s1+" and "+s2+" are anagrams");
}
else
{
    System.out.println("Strings "+s1+" and "+s2+" are not
anagrams");
}
}
}
```

OUTPUT:

```
E:\books and pdfs\sem4 pdfs\java lab\week5>javaC Anagrams.java

E:\books and pdfs\sem4 pdfs\java lab\week5>java Anagrams.java
apple
pleap
Strings apple and pleap are anagrams

E:\books and pdfs\sem4 pdfs\java lab\week5>java Anagrams.java
hello
heloo
Strings hello and heloo are not anagrams
```

Week 6:**Program 1:****Code:**

```
import java.util.*;
public class Week6__1{

    public static void main(String...arg){

        Cost c1=new Cost();
        c1.display_details();

    }

}

class vehicle {
    Scanner sc=new Scanner(System.in);
    String vehicle_type = sc.next();
}

class brand extends vehicle {
    Scanner sc=new Scanner(System.in);
    String brand_name = sc.next();

}

class Cost extends brand {
    Scanner sc=new Scanner(System.in);
    double cost1 = sc.nextDouble();

    Cost() {
        System.out.println("Constructor of cost class");
    }

    void display_details(){
        System.out.println("type of vehicle is "+vehicle_type);
        System.out.println("type of brand is " + brand_name);
        System.out.println("cost of vehicle "+vehicle_type+" is "+cost1);

    }

}
```

```
}
```

Output:

```
E:\books and pdfs\sem4 pdfs\java lab\week6>javac Week6__1.java

E:\books and pdfs\sem4 pdfs\java lab\week6>java Week6__1.java
bike
royal enfield
170100
Constructor of cost class
type of vehicle is bike
type of brand is royal
cost of vehicle bike is 170100.0
```

Program 2:**Code:**

```
import java.util.*;
class Week6__2{
public static void main(String... arg){
    figure_3d f1[]=new figure_3d[4];
    f1[0]=new cylinder();
    f1[1]=new cone();
    f1[2]=new sphere();
    f1[3]=new cube();
    f1[0].surface_Area();
    f1[1].surface_Area();
    f1[2].surface_Area();
    f1[3].surface_Area();
}
}

class figure_3d{
    void surface_Area(){
        System.out.println("Total surface Area of the given 3d
figure");
    }
}
```

```
class cylinder extends figure_3d{
void surface_Area(){
    Scanner sc=new Scanner(System.in);
    System.out.println(" radius and height of cylinder ");
    double r=sc.nextDouble();
    double h=sc.nextDouble();
    System.out.println("Total surface area of cylinder is
"+(2*3.14*r*(r+h)));
}

}
class cone extends figure_3d{
void surface_Area(){
    Scanner sc=new Scanner(System.in);
    System.out.println(" radius and slant height of cone ");
    double r=sc.nextDouble();
    double h=sc.nextDouble();
    System.out.println("Total surface area of cylinder is
"+(3.14*r*(r+h)));
}

}
class sphere extends figure_3d{
void surface_Area(){
    Scanner sc=new Scanner(System.in);
    System.out.println(" radius of sphere ");
    double r=sc.nextDouble();
    System.out.println("Total surface area of cylinder is
"+(4*3.14*r*r));
}

}
class cube extends figure_3d{
void surface_Area(){
    Scanner sc=new Scanner(System.in);
    System.out.println(" side of cube ");
    double a=sc.nextDouble();
    System.out.println("Total surface area of cylinder is "+(6*a*a));
}

}
```


Output:

```
E:\books and pdfs\sem4 pdfs\java lab\week6>javac Week6__2.java

E:\books and pdfs\sem4 pdfs\java lab\week6>java Week6__2.java
radius and height of cylinder
12 3
Total surface area of cylinder is 1130.4
radius and slant height of cone
4 2
Total surface area of cylinder is 75.36
radius of sphere
5
Total surface area of cylinder is 314.0
side of cube
6
Total surface area of cylinder is 216.0
```

Week 7:

Program 1:

Code:

Stud.java:

```
package pak1;
public class Stud {
    public int roll_num=12;
    public String name="gayathri";
}
```

Spts.java

```
package pak2;
public interface Spts{
    void display();
}
```

Student_Report.java:

```
package report;
import pak1.Stud;
import pak2.Spts;

class sport implements Spts{
    public void display(){
        System.out.println("Sports available : \n throwball\n table
tennis\n basket ball\n cricket\n football");
    }
}

class Student_Report{
    public static void main(String... arg){
        Stud s1=new Stud();
        Spts s2=new sport();
        System.out.println("Name of the student is "+s1.name);
        System.out.println("Roll number of the student is
"+s1.roll_num);
        s2.display();
    }
}
```

```
E:\books and pdfs\sem4 pdfs\java lab\week7>javac -d . Spts.java
```

```
E:\books and pdfs\sem4 pdfs\java lab\week7>javac -d . Stud.java
```

```
E:\books and pdfs\sem4 pdfs\java lab\week7>javac -d . Student_Report.java
```

```
Name of the student is gayathri
Roll number of the student is 12
Sports available :
    throwball
    table tennis
    basket ball
    cricket
    football
```

Program 2:**Code:**

```
import java.util.*;
import java.io.*;
import java.lang.*;

import java.util.*;
class Week7_2{
    public static void main(String... arg){
        Scanner sc=new Scanner(System.in);

        byte b=sc.nextByte();
        short s=sc.nextShort();

        int i=sc.nextInt();
        long l=sc.nextLong();
        float f=sc.nextFloat();
        double d=sc.nextDouble();
        char c='c';
        boolean boo=true;

        Byte byteobj=b;
        Short shortobj=s;
        Integer intobj=i;
        Long longobj=l;
        Float floatobj=f;
        Double doubleobj=d;
        Character charobj=c;
        Boolean boolobj=boo;

        Vector v1=new Vector();
```

```
        v1.add(byteobj);
        v1.add(shortobj);
        v1.add(intobj);
        v1.add(longobj);
        v1.add(floatobj);
        v1.add(doubleobj);
        v1.add(charobj);
        v1.add(boolobj);
        System.out.println("---Printing primitive values---");
        Iterator itr=v1.iterator();
        while(itr.hasNext()){
            System.out.println(itr.next());
        }
    }
}
```

Output:

```
E:\books and pdfs\sem4 pdfs\java lab\week7>java Week7_2.java
Note: Week7_2.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.
1
23
123
32344345
223.4
2445.22
---Printing primitive values---
1
23
123
32344345
223.4
2445.22
c
true
```

Week 8:

Program 1:

Code:

```
import java.util.*;
import java.lang.Math;
class Week8_1{
public static void main(String... arg){
    int x1=0,x2,r;
    Random random=new Random();
    x2=random.nextInt(200);

    while(x1==0){
        x1=random.nextInt(200);
    }

    if(x2>x1){
        x2=x2+x1;
        x1=x2-x1;
        x2=x2-x1;
    }
    int n=0;
    while(n==0){
        n=random.nextInt(100);
    }
    System.out.println(x1);
    System.out.println(x2);
    System.out.println(n);
    for(int i=0;i<n;i++){
        r=random.nextInt(x1-x2+1)+x2;
        System.out.print(r+" ");
    }
}
}
```

Output:

```
E:\books and pdfs\sem4 pdfs\java lab\week8>javac Week8_1.java
E:\books and pdfs\sem4 pdfs\java lab\week8>java Week8_1.java
57
31
30
47 51 52 39 33 53 45 55 31 50 57 33 57 49 50 38 54 52 44 39 52 44 53 37 42 33 42 51 53 37
E:\books and pdfs\sem4 pdfs\java lab\week8>
```

Program 2:**Code:**

```
import java.util.*;
class MyArrayList{
    private Object[] arrlist=new Object[1];
    private int size_=0;
    public void add(Object object){
        if(size_==arrlist.length){
            arrlist=Arrays.copyOf(arrlist,arrlist.length*2);
        }
        arrlist[size_]=object;
        size_++;
    }
    public Object get(int ind){
        if(ind>=size_||ind<0){
            throw new ArrayIndexOutOfBoundsException("element not
found");
        }
        return arrlist[ind];
    }
    public void remove(int ind){
        if(ind>=size_||ind<0){
            throw new ArrayIndexOutOfBoundsException("cant delete");
        }
        for(int i=ind;i<size_;i++){
            arrlist[i]=arrlist[i+1];
        }
        size_--;
    }
    public int size(){
```

```
        return size_;
    }
    public static void main(String... ARG){

        Scanner sc=new Scanner(System.in);
        MyArrayList myArrayList1 = new MyArrayList();
        System.out.println("enter number of elements");
        int n=sc.nextInt();
            System.out.println("enter elements");

        for(int i=0;i<n;i++){
            myArrayList1.add(sc.nextInt());
        }
        System.out.println("\nSize: " + myArrayList1.size());
        for (int i = 0; i < myArrayList1.size(); i++) {
            System.out.print(myArrayList1.get(i)+" ");
        }

            System.out.println();

            System.out.println("enter element to be added");

                myArrayList1.add(sc.nextInt());
                System.out.println("\nSize: " + myArrayList1.size());
        for (int i = 0; i < myArrayList1.size(); i++) {
            System.out.print(myArrayList1.get(i)+" ");
        }
        System.out.println();

        System.out.println("enter element to be removed");

            myArrayList1.remove(sc.nextInt());

        System.out.println("\nSize: " + myArrayList1.size());

        for (int i = 0; i < myArrayList1.size(); i++) {
            System.out.print(myArrayList1.get(i)+" ");
        }
    }
}
```

Output:

```
E:\books and pdfs\sem4 pdfs\java lab\week8>javac MyArrayList.java

E:\books and pdfs\sem4 pdfs\java lab\week8>java MyArrayList.java
enter number of elements
5
enter elements
1 2 3 4 5

Size: 5
1 2 3 4 5
enter element to be added
7

Size: 6
1 2 3 4 5 7
enter element to be removed
3

Size: 5
1 2 3 5 7
```

Program 3:

Code:

```
import java.util.*;

class Week8_3{
public static void main(String... arg){
    Scanner sc=new Scanner(System.in);
    employee e1=new employee();
    employee e2=new employee();
    employee e3=new employee();
    e1.setter(sc.nextInt(),sc.next(),sc.nextInt());
    e2.setter(sc.nextInt(),sc.next(),sc.nextInt());
    e3.setter(sc.nextInt(),sc.next(),sc.nextInt());
    HashMap<Integer,employee> hash1=new HashMap<Integer,employee>();
    hash1.put(e1.getid(),e1);
    hash1.put(e2.getid(),e2);
    hash1.put(e3.getid(),e3);
    int search_key=sc.nextInt();
```



```
        if(hash1.containsKey(search_key)){
            System.out.println("Searched employee found\n employee id is "+
search_key+" employee name is "+hash1.get(search_key).getname()+" and age
is "+hash1.get(search_key).getage());
        }
        else{
            System.out.println("searched employee not found");
        }
    }
}

class employee{
private int id;
private String name;
private int age;
void setter(int i,String n,int a){
id=i;
name=n;
age=a;
}
int getid(){
    return id;
}
String getname(){
    return name;
}
int getage(){
    return age;
}
}
```

output:

```
E:\books and pdfs\sem4 pdfs\java lab\week8>javac Week8_3.java

E:\books and pdfs\sem4 pdfs\java lab\week8>java Week8_3.java
1 shiva 21
2 ravi 22
3 sandhya 20
2
Searched employee found
employee id is 2 employee name is ravi and age is 22
```

Week 9:

Program 1:

Code:

```
import java.io.*;
import java.lang.*;
import java.util.*;
public class Week9_1{
public static void main(String[] args) throws IOException
{
    File file1 = new File("E:\\books and pdfs\\sem4 pdfs\\java
lab\\week9\\sample.txt");
    FileInputStream fs = new FileInputStream(file1);
    InputStreamReader inp = new InputStreamReader(fs);

    BufferedReader reader = new BufferedReader(inp);
    String line;
    List<String> a1=new ArrayList<String>();
    // Initializing counters
    int terminating_symbols = 0;
    int alphabets=0;
    int numbers=0;
    int splsymbols=0;
    int data=inp.read();

    while(data!=-1)
    {
        char c = (char) data;
        if(c>='a' && c<='z' || c>='A' && c<='Z'){
            alphabets+=1;
        }
    }
}
```

```
        else if(c>='0' && c<='9')
        {
            numbers+=1;
        }
        else if(c==' '||c=='\n' || c=='\t'){
            terminating_symbols+=1;
        }
        else{
            splsymbols+=1;
        }
        data=inp.read();
    }
    try{
        FileOutputStream obj1=new FileOutputStream("Statistic.txt");
        String s1=String.format("Total number of alphabets = %d \nTotal
number of numbers = %d \nTotal number of terminating_symbols = %d \nTotal
number of special symbols = %d \n
",alphabets,numbers,terminating_symbols,splsymbols);
        byte[] byteArray = s1.getBytes();

        obj1.write(byteArray);

    }
    catch (IOException e) {
        System.out.println("An error occurred."+e);
    }
    System.out.println("Total number of alphabets = " + alphabets);
    System.out.println("Total number of numbers = " + numbers);
    System.out.println("Total number of terminating_symbols = " +
terminating_symbols);
    System.out.println("Total number of special symbols = " +
splsymbols);
    }
}
```

Output:

Sample.txt:

```
sample.txt x
Stop words are available in abundance in any human language. By removing these words, we remove the low-level information from our text in order to give more focus to the important information . In order words , we can say that the removal of such words does not show any negative consequences on the model we train for our task . Removal of stop words definitely reduces the dataset size and thus reduces the training time due to the fewer number of tokens involved in the training .

English has developed over the course of more than 1,400 years. The earliest forms of English , a group of West Germanic (Ingvaenonic) dialects brought to Great Britain by Anglo-Saxon settlers in the 5th century , are collectively called Old English. Middle English began in the late 11th century with the Norman conquest of England; this was a period in which English was influenced by Old French , in particular through its Old Norman dialect.[ 9 ][ 10 ] Early Modern English began in the late 15th century with the introduction of the printing press to London, the printing of the King James Bible and the start of the Great Vowel Shift .[ 11 ]
```

```
E:\books and pdfs\sem4 pdfs\java lab\week9>javac Week9_1.java

E:\books and pdfs\sem4 pdfs\java lab\week9>java Week9_1.java
Total number of alphabets = 889
Total number of numbers = 14
Total number of terminating_symbols = 215
Total number of special symbols = 40

E:\books and pdfs\sem4 pdfs\java lab\week9>
```

```
Statistic.txt x

Total number of alphabets = 889
Total number of numbers = 14
Total number of terminating_symbols = 215
Total number of special symbols = 40
```

Program2:

Code:

```
import java.io.*;
import java.io.FileReader;
import java.io.IOException;

import java.io.BufferedReader;

import java.util.*;
```

```
import java.lang.*;
class Week9b{
    public static void main(String... arg){
        String line="";
        try{
            BufferedReader br = new BufferedReader(new FileReader("data.csv"));
            ArrayList<Integer> li=new ArrayList<Integer>();
            System.out.println("Before sort");
            while((line=br.readLine())!=null){
                String data[]=line.split(",");
                System.out.println(data[0]+" "+data[1]+" "+data[2]+"
"+data[3]+" "+Integer.parseInt(data[3])*Integer.parseInt(data[2]));
                li.add(Integer.parseInt(data[3]));
            }
            br.close();
            Collections.sort(li);
            System.out.println("after sort");

            for(int i:li){
                try{
                    BufferedReader br1 = new BufferedReader(new
FileReader("data.csv"));
                    while((line=br1.readLine())!=null){

                        String data[]=line.split(",");
                        if(i==(Integer.parseInt(data[3]))){
                            System.out.println(data[0]+" "+data[1]+" "+data[2]+"
"+data[3]+" "+Integer.parseInt(data[3])*Integer.parseInt(data[2]));
                        }
                    }
                }
                catch(Exception e){
                    System.out.println(e);
                }
            }
        }
        catch(Exception e){
            System.out.println("no file found");
        }
    }
}
```

```
}
```

Output:

Data.csv:

```
1,ITEM1,100,75
2,item2,200,90
3,item3,50,64
4,item4,70,70
5,item5,99,22
```

```
E:\books and pdfs\sem4 pdfs\java lab\week9>javac week9b.java
```

```
E:\books and pdfs\sem4 pdfs\java lab\week9>java week9b.java
```

Before sort

```
1 ITEM1 100 75 7500
2 item2 200 90 18000
3 item3 50 64 3200
4 item4 70 70 4900
5 item5 99 22 2178
```

after sort

```
5 item5 99 22 2178
3 item3 50 64 3200
4 item4 70 70 4900
1 ITEM1 100 75 7500
2 item2 200 90 18000
```

```
E:\books and pdfs\sem4 pdfs\java lab\week9>
```

Program 3:

Code:

```
import java.util.*;
import java.io.*;
class Week9_3{
    public static void main(String[] args) {
        File file = new File("sample.txt");
```

```
File file1 = new File("stopwords.txt");
ArrayList li1=new ArrayList();

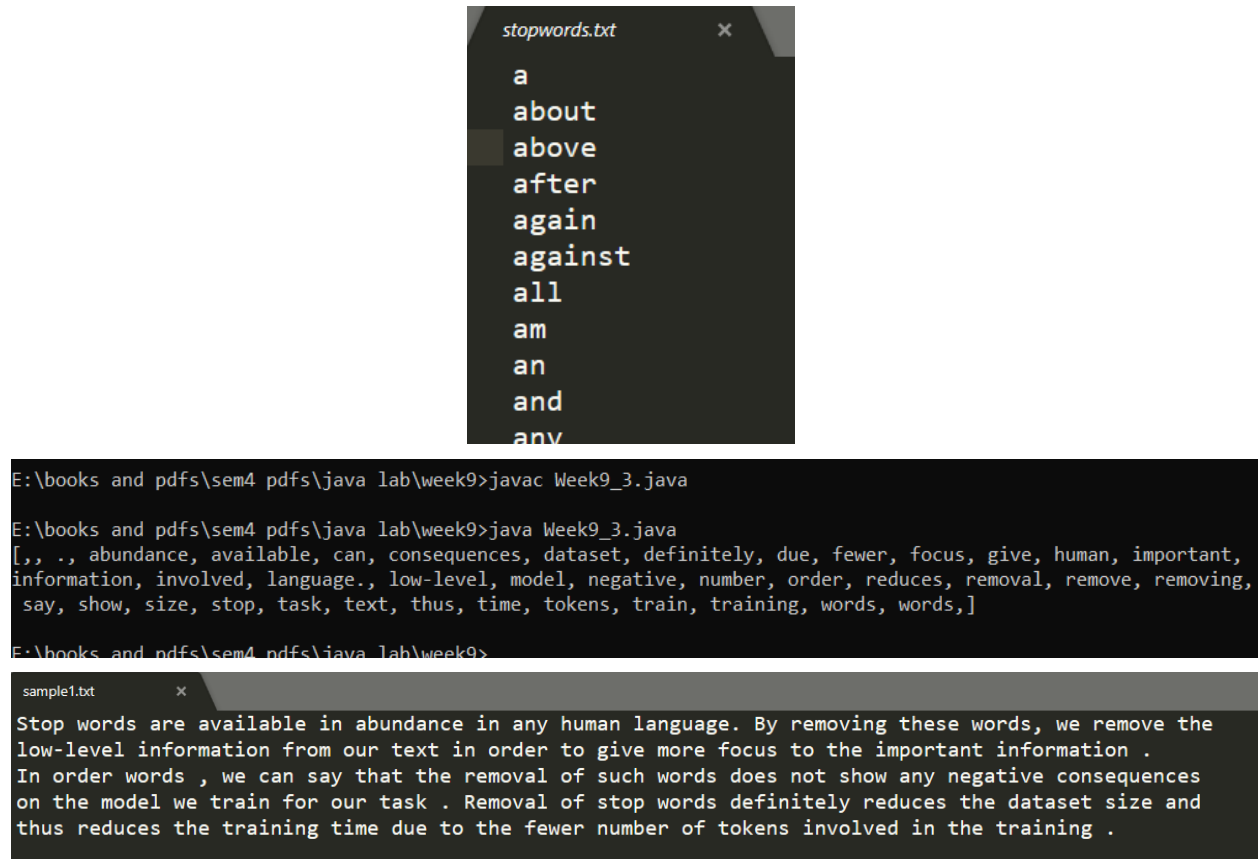
try{
Scanner input1 = new Scanner(file1);
while (input1.hasNext()) {
    String a=input1.next();
    li1.add(a.toLowerCase());
}

}
catch(FileNotFoundException e){
System.out.println("file not found");
}
try{
Scanner input = new Scanner(file);
ArrayList li=new ArrayList();
while (input.hasNext()) {
    String a=input.next().toLowerCase();
    if(li1.contains(a) ||li.contains(a))
        continue;
    li.add(a);
}
Collections.sort(li);

System.out.println(li);
}
catch(FileNotFoundException e){
    System.out.println("file not found");
}
}
}
```

Output:

stopwords.txt contains all stop words,



The screenshot shows a Java IDE with two files open. The first file, `stopwords.txt`, contains a list of common English words: `a`, `about`, `above`, `after`, `again`, `against`, `all`, `am`, `an`, `and`, and `any`. The second file, `sample1.txt`, contains a paragraph of text: "Stop words are available in abundance in any human language. By removing these words, we remove the low-level information from our text in order to give more focus to the important information . In order words , we can say that the removal of such words does not show any negative consequences on the model we train for our task . Removal of stop words definitely reduces the dataset size and thus reduces the training time due to the fewer number of tokens involved in the training ."

```
E:\books and pdfs\sem4 pdfs\java lab\week9>javac Week9_3.java
E:\books and pdfs\sem4 pdfs\java lab\week9>java Week9_3.java
[, , ., abundance, available, can, consequences, dataset, definitely, due, fewer, focus, give, human, important,
information, involved, language., low-level, model, negative, number, order, reduces, removal, remove, removing,
say, show, size, stop, task, text, thus, time, tokens, train, training, words, words,]
E:\books and pdfs\sem4 pdfs\java lab\week9>
```

```
sample1.txt
Stop words are available in abundance in any human language. By removing these words, we remove the
low-level information from our text in order to give more focus to the important information .
In order words , we can say that the removal of such words does not show any negative consequences
on the model we train for our task . Removal of stop words definitely reduces the dataset size and
thus reduces the training time due to the fewer number of tokens involved in the training .
```

Week 10:

Program 1:

Code:

```
import java.util.*;
class Week10_1{
    public static void main(String... arg){
        Scanner sc=new Scanner(System.in);
        int a,b,c;
        try{
            a=Integer.parseInt(sc.next());
            b=Integer.parseInt(sc.next());
            System.out.println(a/b);
        }
        catch(NumberFormatException e){
            System.out.println("number format error "+e);
        }
    }
}
```



```
        catch(ArithmeticException e){
            System.out.println("Arithmetic expression error "+e);
        }
    }
}
```

Output:

```
E:\books and pdfs\sem4 pdfs\java lab\week10>javac Week10_1.java

E:\books and pdfs\sem4 pdfs\java lab\week10>java Week10_1.java
12 3
4

E:\books and pdfs\sem4 pdfs\java lab\week10>java Week10_1.java
12 0
Arithmetic expression error java.lang.ArithmeticException: / by zero

E:\books and pdfs\sem4 pdfs\java lab\week10>java Week10_1.java
sample 3
number format error java.lang.NumberFormatException: For input string: "sample"
```

Program 2:**Code:**

```
import java.util.*;
class Week10_2{

    public static void main(String... arg){
        try
        {
            Scanner sc=new Scanner(System.in);
            divisible(sc.nextInt());

        }
        catch (Exception e)
        {
            System.out.println(e);
        }
    }

    public static void divisible(int a) throws divisiblebytwoException {
        if(a%2!=0){
```

```
        throw new divisiblebytwoException("not divisible by 2");
    }
    else{
        System.out.println(a+" is divisible by 2");
    }
}
}
class divisiblebytwoException extends Exception{
    divisiblebytwoException(String s){
        System.out.println(s);
    }
}
```

Output:

```
E:\books and pdfs\sem4 pdfs\java lab\week10>javac Week10_2.java

E:\books and pdfs\sem4 pdfs\java lab\week10>java Week10_2.java
12
12 is divisible by 2

E:\books and pdfs\sem4 pdfs\java lab\week10>java Week10_2.java
11
not divisible by 2
divisiblebytwoException
```

Week 11:

Program:

Aim:

Write a program that creates 3 threads by extending the Thread class. First thread displays “Good Morning” every 1 sec, the second thread displays “Hello” every 2 seconds and the third displays Welcome” every 3 seconds. (Repeat the same by implementing Runnable).

Code:

```
class Week11_1{
    public static void main(String... arg){
```

```
        GoodMorning t1=new GoodMorning();
        Hello t2= new Hello();
        Welcome t3=new Welcome();
        t1.start();
        t2.start();
        t3.start();
    }
}

class GoodMorning extends Thread{
    public void run(){
        try{
            for(int i=0;i<10;i++){
                sleep(1000);
                System.out.println("Good Morning");
            }
        }
        catch(Exception e){}
    }
}

class Hello extends Thread{
    public void run(){
        try{
            for(int i=0;i<10;i++){
                sleep(2000);
                System.out.println("Hello");
            }
        }
        catch(Exception e){}
    }
}

class Welcome extends Thread{
    public void run(){
        try{
            for(int i=0;i<10;i++){
                sleep(3000);
                System.out.println("Welcome");
            }
        }
        catch(Exception e){}
    }
}
```

```
}
```

Output:

```
PS E:\books and pdfs\sem4 pdfs\java lab\week11> javac .\Week11_1.java
PS E:\books and pdfs\sem4 pdfs\java lab\week11> java .\Week11_1.java
Good Morning
Good Morning
Hello
Good Morning
Welcome
Hello
Good Morning
Good Morning
Welcome
Hello
Good Morning
Good Morning
Hello
Good Morning
Welcome
Good Morning
Hello
Good Morning
Welcome
Hello
Hello
Welcome
Hello
Welcome
Hello
Welcome
Hello
Hello
Welcome
Welcome
Welcome
Welcome
```

b) Aim:

Write a program to illustrate Thread synchronization.

Program:

```
public class Week11_2 {
    public static void main(String... arg) throws Exception{
        Counter c=new Counter();
        Thread t1=new Thread(new Runnable(){
            public void run(){
                for(int i=1;i<=1000;i++){
                    c.increment();
                }
            }
        });
        Runnable R1=()->{
            for(int i=1;i<=1000;i++){
                c.increment();
            }
        };

        t1.start();
        Thread t2=new Thread(R1);

        t2.start();

        t1.join();
        t2.join();
        System.out.println(c.count);
    }
}

class Counter{
    int count=0;
    public synchronized void increment(){
        count++;
    }
}
```

Output:

```
PS E:\books and pdfs\sem4 pdfs\java lab\week11> javac .\Week11_2.java
PS E:\books and pdfs\sem4 pdfs\java lab\week11> java .\Week11_2.java
2000
```

12)a)

Aim:

Create a JApplet that displays a message which is scrolling from left to right and vice versa

Code:

```
import java.awt.*;
import java.applet.*;
import javax.swing.*;

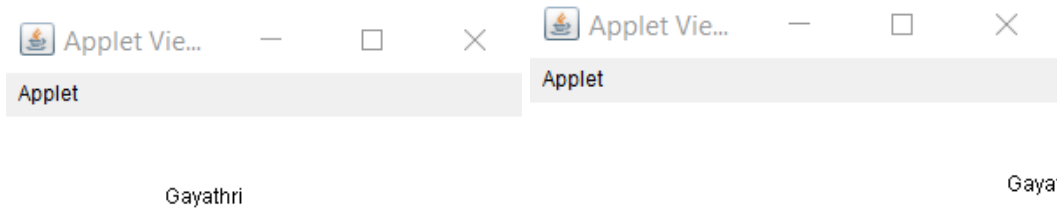
public class Week12a extends Applet implements Runnable{
    int x,y,value;
    String s;
    Thread t1;
    public void init(){
        x=2;
        y=50;
        s="Gayathri";
        value=1;
        t1=new Thread(this);
        t1.start();
    }
    public void update(){
        x+=2*value;
        if(x<100){
            value+=1;
        }
        if(x>300)
        {
            value-=1;
        }
        System.out.println(x);
    }
    public void run(){
        while(true){
            update();
            repaint();
            try{
```

```
        Thread.sleep(1000);
    }
    catch(Exception e){}
}
}
public void paint(Graphics g)
{
    g.drawString(s,x,y);
}
}
```

Myapplet.html:

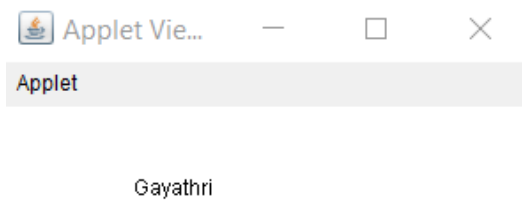
```
<html>
<body>
<applet code="Week12a.class" width="300" height="300">
</applet>
</body>
</html>
```

```
E:\books and pdfs\sem4 pdfs\java lab\Week12>javac Week12a.java
E:\books and pdfs\sem4 pdfs\java lab\Week12>appletviewer myapplet.html
```



Applet started.

Applet started.



Applet started.

12)b)

Aim:

Write a program that displays a sample registration page using Swing controls using appropriate layout managers.

Code:

```
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;

import java.awt.FlowLayout;
import javax.swing.JButton;
import javax.swing.JFrame;
import javax.swing.JLabel;
import javax.swing.JPanel;
import javax.swing.JOptionPane;
import javax.swing.JTextField;
import javax.swing.JTextArea;
// import java.awt.event.ActionEvent;
// import java.awt.event.ActionListener;
import javax.swing.JRadioButton;
import javax.swing.ButtonGroup;
import java.awt.GridBagLayout;
import java.awt.GridBagConstraints;

import javax.swing.border.Border;
import javax.swing.border.LineBorder;

public class Week12b{
    public static void main(String... arg){
        registration r1=new registration();

    }
}
class registration extends JFrame{
    JTextField t1,t2,t3,t4,t5;
    JButton b1,b2,b;
    JRadioButton g1,g2;
    ButtonGroup g1g2;
    JLabel l1,l2,l3,l4,l5,l6,l7;
    GridBagConstraints gbc;
    JPanel j1,j2;
    JTextArea a1;
    // String branch[]={ "cse", "ece", "eee", "mech", "civil" };
    // JComboBox br=new JComboBox(branch);
    public registration(){
        setLayout(new GridBagLayout());
```

```
gbc=new GridBagConstraints();  
l1=new JLabel("Your good Name");
```

```
gbc.gridx=0;  
gbc.gridy=1;  
add(l1,gbc);  
t1=new JTextField(20);  
gbc.gridx=1;  
gbc.gridy= 1;  
add(t1,gbc);
```

```
l2=new JLabel("Your Roll number");  
gbc.gridx=0;  
gbc.gridy=2;  
add(l2,gbc);  
t2=new JTextField(20);  
gbc.gridx=1;  
gbc.gridy= 2;  
add(t2,gbc);
```

```
l3=new JLabel("Your Branch");  
gbc.gridx=0;  
gbc.gridy=3;  
add(l3,gbc);  
t3=new JTextField(20);  
gbc.gridx=1;  
gbc.gridy=3;  
add(t3,gbc);
```

```
l4=new JLabel("Your Section");  
gbc.gridx=0;  
gbc.gridy=4;  
add(l4,gbc);  
t4=new JTextField(20);  
gbc.gridx=1;  
gbc.gridy= 4;  
add(t4,gbc);
```

```
l5=new JLabel("Your Mobile number");
gbc.gridx=0;
gbc.gridy=5;
add(l5,gbc);
t5=new JTextField(20);
gbc.gridx=1;
gbc.gridy= 5;
add(t5,gbc);
```

```
l6=new JLabel("Your Gender");
gbc.gridx=0;
gbc.gridy=6;
add(l6,gbc);
```

```
j1=new JPanel();
j2=new JPanel();
```

```
g1=new JRadioButton("Male");
g1g2=new ButtonGroup();
g1g2.add(g1);
```

```
j1.add(g1);
g2=new JRadioButton("Female");
j1.add(g2);
g1g2.add(g2);
```

```
gbc.gridx=1;
gbc.gridy=6;
add(j1,gbc);
```

```
l7=new JLabel("Your Address");
gbc.gridx=0;
gbc.gridy=7;
```

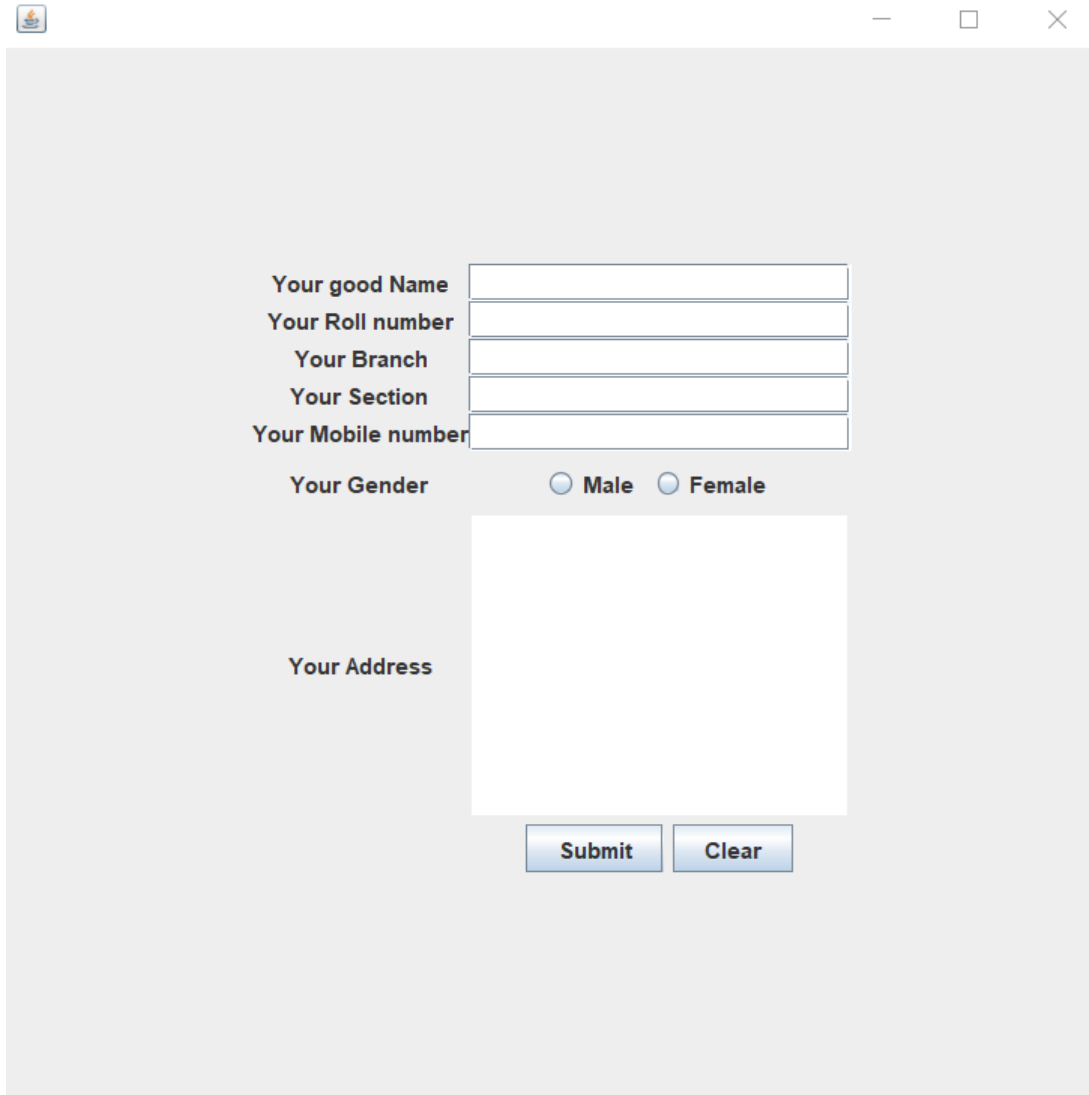
```
add(17, gbc);

a1=new JTextArea(10,20);
gbc.gridx=1;
gbc.gridy=7;
add(a1,gbc);


b1=new JButton("Submit");
j2.add(b1);
b2=new JButton("Clear");
j2.add(b2);
gbc.gridx=1;
gbc.gridy=8;
add(j2,gbc);
// b1.addActionListener(this);
// b2.addActionListener(this);
setVisible(true);
setSize(600,600);

setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    }
}
```

Output:



Your good Name

Your Roll number

Your Branch

Your Section

Your Mobile number

Your Gender ☐ Male ☐ Female

Your Address

12c)

Aim: Write a program for handling mouse events with adapter classes.

Program:

```
import java.awt.*;  
import java.awt.event.*;  
import javax.swing.*;  
import javax.swing.JFrame;  
public class Week12c extends MouseMotionAdapter{  
  
    public static void main(String... arg){
```

```
        mouse_click m=new mouse_click();

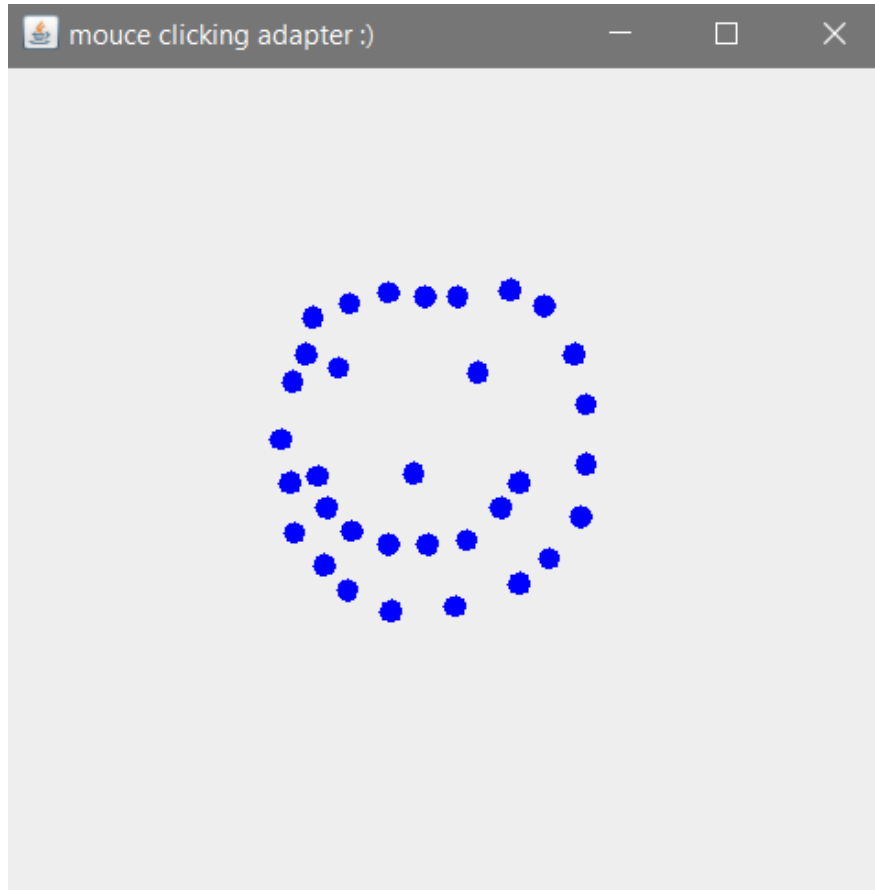
    }

}

class mouse_click extends MouseAdapter{
    JFrame frame;
    mouse_click(){
        frame=new JFrame("mouse clicking adapter :) ");
        frame.addMouseListener(this);
        frame.setSize(400,400);
        frame.setLayout(null);
        frame.setVisible(true);
        frame.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

    }
    public void mouseClicked(MouseEvent e){
        Graphics g=frame.getGraphics();
        g.setColor(Color.BLUE);
        g.fillOval(e.getX(),e.getY(),10,10);
    }
}
```

Output:

**WEEK 13**

13a) Aim: Create an interface containing 3 radio buttons named line, rectangle and oval. Based on the radio button selected, allow user to draw lines, rectangles or ovals as per the locations selected by the user.

```
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;
import java.applet.*;

public class Week13a extends Applet implements MouseMotionListener{
    JLabel l1,l2;
    Panel p1,p2;
    JRadioButton r1,r2,r3;
    JButton b1,b2;
    ButtonGroup bg;
    JTextField tf;
    int x;
    public void init(){
```

```
setBackground(Color.gray);
p1=new Panel(null);
p1.setBackground(Color.blue);
p1.setBounds(0,100,1000,500);
p1.addMouseMotionListener(this);
add(p1);

p2=new Panel(null);
p2.setBackground(Color.white);
p2.setBounds(200,200,850,600);

l1=new JLabel("choice");
l1.setBounds(150,10,90,20);
p2.add(l1);

r1=new JRadioButton("LINE");
r1.setBounds(220,10,90,20);
r2=new JRadioButton("OVAL",true);
r2.setBounds(320,10,90,20);
r3=new JRadioButton("RECTANGLE");
r3.setBounds(420,10,100,20);
bg=new ButtonGroup();

bg.add(r1);
bg.add(r2);
bg.add(r3);

l2=new JLabel("Size");
l2.setBounds(200,60,50,30);
p2.add(l2);
b1=new JButton("-");
b1.setBounds(250,60,50,30);

b2=new JButton("+");
tf=new JTextField(5);
tf.setBounds(300,60,50,30);

b2.setBounds(350,60,50,30);
tf.setEnabled(false);
tf.setFont(new Font("",Font.BOLD,18));
tf.setText("8");

x=Integer.parseInt(tf.getText());
```



```
b1.addActionListener(  
new ActionListener(){  
    public void actionPerformed(ActionEvent e){  
        if(x!=0)  
            x-=1;  
        tf.setText(String.valueOf(x));  
    }  
});  
b2.addActionListener(  
new ActionListener(){  
    public void actionPerformed(ActionEvent e){  
        if(x!=0)  
            x+=1;  
        tf.setText(String.valueOf(x));  
    }  
});  
p2.add(r1);  
p2.add(r2);  
p2.add(r3);  
p2.add(b1);  
p2.add(b2);  
p2.add(tf);  
  
add(p1);  
add(p2);  
  
}  
public void mouseDragged(MouseEvent ae){  
    Graphics g=p1.getGraphics();  
    g.setColor(Color.white);  
    if(r1.isSelected())  
    {  
        g.drawLine(ae.getX(),ae.getY(),ae.getX(),ae.getY()+2);  
    }  
    if(r2.isSelected()){  
        g.fillOval(ae.getX(),ae.getY(),x,x);  
    }  
    if(r3.isSelected())  
        g.fillRect(ae.getX(),ae.getY(),x,x);  
}  
public void mouseMoved(MouseEvent ae){
```

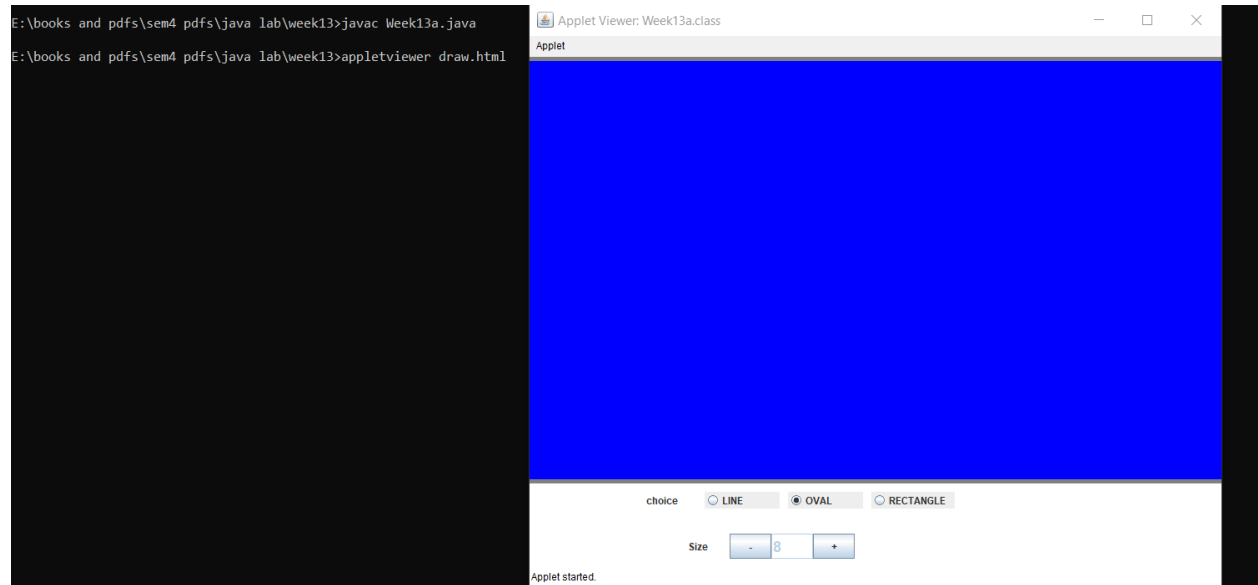
```
}  
}
```

Draw.html:

```
<html>  
  <title>My Applets Demo</title>  
  <body>  
    <applet code = "Week13a.class" width = "830" height = "610"></applet>  
  </body>  
</html>
```

Output:

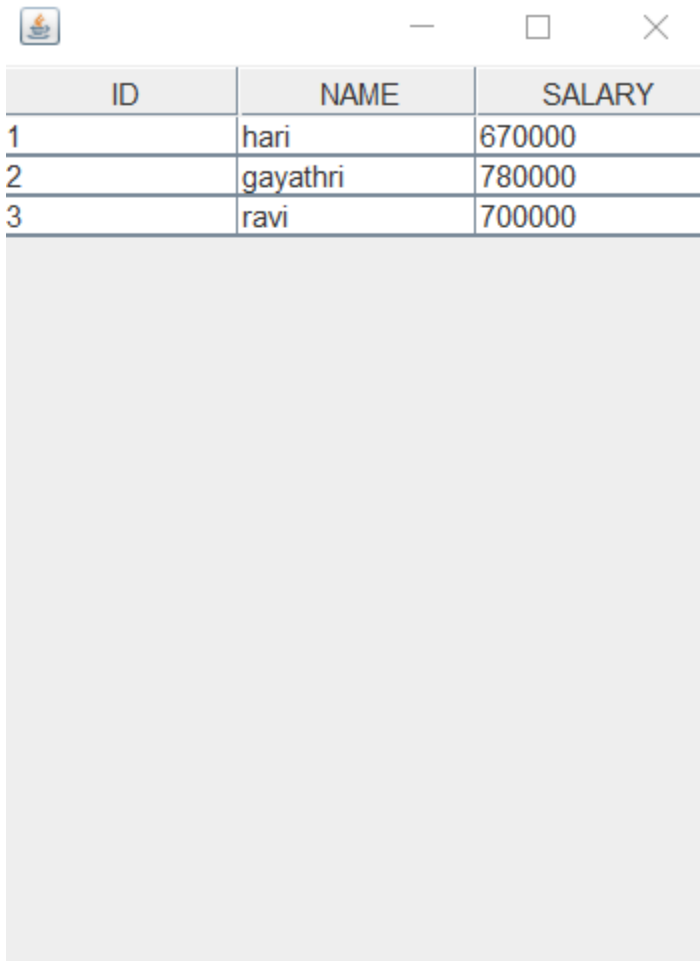
```
E:\books and pdfs\sem4 pdfs\java lab\week13>javac Week13a.java  
E:\books and pdfs\sem4 pdfs\java lab\week13>appletviewer draw.html
```




```
String column[]={"ID","NAME","SALARY"};
JTable jt=new JTable(data,column);
JScrollPane sp=new JScrollPane(jt);
f.add(sp);
f.setSize(300,400);
f.setVisible(true);
    }
}
```

Output:

```
PS E:\books and pdfs\sem4 pdfs\java lab\week13> javac .\Week13b.java
PS E:\books and pdfs\sem4 pdfs\java lab\week13> java .\Week13b.java
[]
```



ID	NAME	SALARY
1	hari	670000
2	gayathri	780000
3	ravi	700000

13)c)

Code:

```
import javax.swing.*;
import java.awt.*;
import java.awt.event.*;
import java.io.*;
import java.util.*;

class Week13_c {
    public static void main(String... s) throws Exception {
        Csv csv = new Csv();
    }
}

class Csv extends JFrame implements ActionListener{
    JComboBox<String> deptBox;
    JFileChooser fileChooser;
    JTextArea t;
    JButton b1,b2;
    String[][] fileInfo = new String[100][100];
    HashSet<String> deptSet = new HashSet<String>();
    int id = 0;

    Csv(){
        b1 = new JButton("Open File");
        b1.addActionListener(this);
        b1.setBounds(40,10,100,20);
        add(b1);
        b2 = new JButton("Generate");
        b2.setBounds(280,10,100,20);
        add(b2);
        b2.setVisible(false);
        t = new JTextArea(10,50);
        t.setBounds(10,40,450,200);
        add(t);

        deptBox = new JComboBox();
        deptBox.addItem("None");
        deptBox.setBounds(160,10,100,20);
        deptBox.setVisible(false);

        b2.addActionListener(new ActionListener(){
```

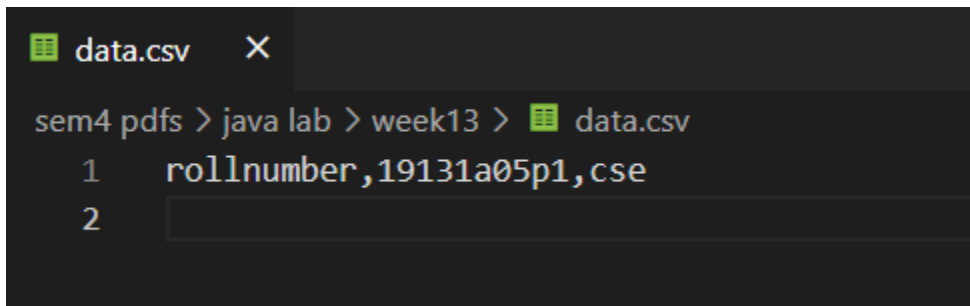
```
public void actionPerformed(ActionEvent ae){
    if(deptBox.getSelectedItem() == "None"){
        t.setText("Select something");
    }else{
        String value = deptBox.getSelectedItem().toString();
        String data = "name | rollno | dept "+"\\n";
        for(int i = 0 ; i < 100; i++){
            if(value == fileInfo[i][2])
            {
                data = data + fileInfo[i][0] + " | " + fileInfo[i][1] + " | "
                + fileInfo[i][2] + "\\n";
            }
        }
        t.setText(data);
    }
}

add(deptBox);
setLayout(null);
setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
setSize(500,400);
setVisible(true);
setLocationRelativeTo(null);
}
```

```
public void actionPerformed(ActionEvent ae){
    fileChooser = new JFileChooser(System.getProperty("user.dir"));
    int response = fileChooser.showOpenDialog(this);
    String line = "";
    if(response == JFileChooser.APPROVE_OPTION){
        deptBox.setVisible(true);
        b2.setVisible(true);
        try{
            File file = fileChooser.getSelectedFile();
            BufferedReader br = new BufferedReader(new FileReader(file));
            while((line = br.readLine())!=null){
                String dept[] = line.split(",");
                if(!deptSet.contains(dept[2]))
                    deptBox.addItem(dept[2]);
                deptSet.add(dept[2]);
                fileInfo[id][0] = dept[0];
                fileInfo[id][1] = dept[1];
            }
        }
    }
}
```

```
        fileInfo[id][2] = dept[2];
        id++;
    }
} catch (Exception e) {}
}
}
```

Output:



```
data.csv X
sem4 pdfs > java lab > week13 > data.csv
1 rollnumber,19131a05p1,cse
2
```

```
Microsoft Windows [Version 10.0.19042.1165]
(c) Microsoft Corporation. All rights reserved.

C:\Users\hp>e:

E:\>cd "books and pdfs"

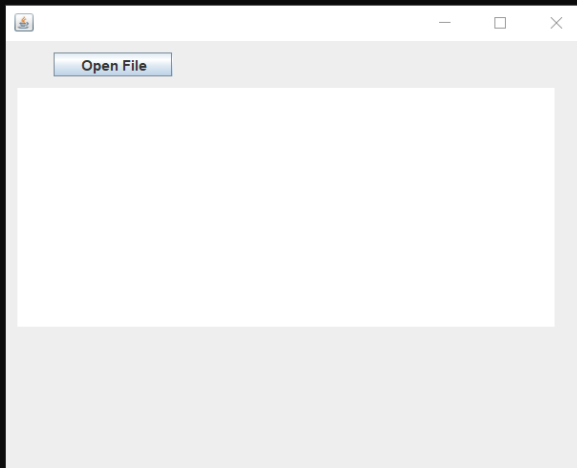
E:\books and pdfs>cd "sem4 pdfs"

E:\books and pdfs\sem4 pdfs>cd "java lab"

E:\books and pdfs\sem4 pdfs\java lab>cd week13

E:\books and pdfs\sem4 pdfs\java lab\week13>javac Week13c.java
Note: Week13c.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.

E:\books and pdfs\sem4 pdfs\java lab\week13>java Week13c.java
Note: Week13c.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.
```



```
Microsoft Windows [Version 10.0.19042.1165]
(c) Microsoft Corporation. All rights reserved.

C:\Users\hp>e:

E:\>cd "books and pdfs"

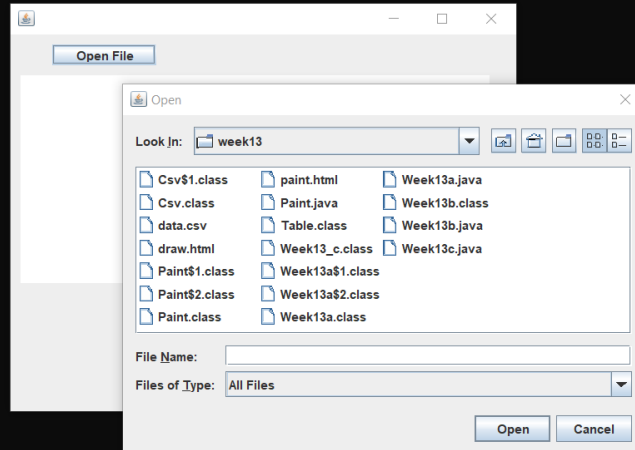
E:\books and pdfs>cd "sem4 pdfs"

E:\books and pdfs\sem4 pdfs>cd "java lab"

E:\books and pdfs\sem4 pdfs\java lab>cd week13

E:\books and pdfs\sem4 pdfs\java lab\week13>javac Week13c.java
Note: Week13c.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.

E:\books and pdfs\sem4 pdfs\java lab\week13>java Week13c.java
Note: Week13c.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.
```



```
Microsoft Windows [Version 10.0.19042.1165]
(c) Microsoft Corporation. All rights reserved.

C:\Users\hp>e:

E:\>cd "books and pdfs"

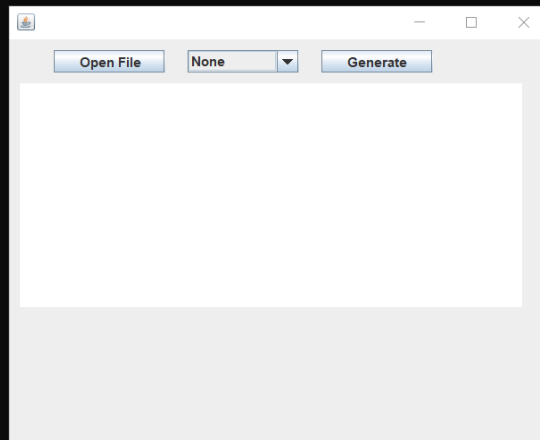
E:\books and pdfs>cd "sem4 pdfs"

E:\books and pdfs\sem4 pdfs>cd "java lab"

E:\books and pdfs\sem4 pdfs\java lab>cd week13

E:\books and pdfs\sem4 pdfs\java lab\week13>javac Week13c.java
Note: Week13c.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.

E:\books and pdfs\sem4 pdfs\java lab\week13>java Week13c.java
Note: Week13c.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.
```




```
Microsoft Windows [Version 10.0.19042.1165]
(c) Microsoft Corporation. All rights reserved.

C:\Users\hp>e:

E:\>cd "books and pdfs"

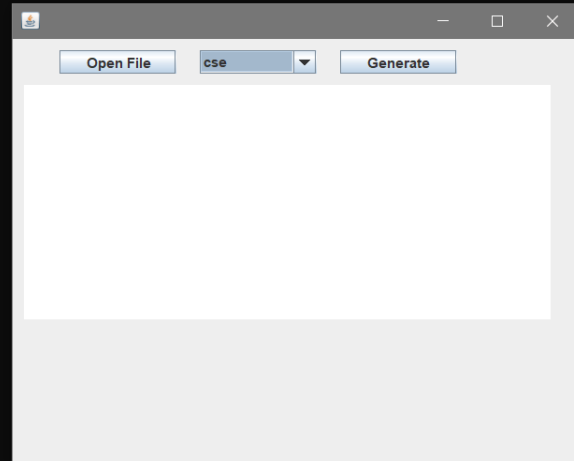
E:\books and pdfs>cd "sem4 pdfs"

E:\books and pdfs\sem4 pdfs>cd "java lab"

E:\books and pdfs\sem4 pdfs\java lab>cd week13

E:\books and pdfs\sem4 pdfs\java lab\week13>javac Week13c.java
Note: Week13c.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.

E:\books and pdfs\sem4 pdfs\java lab\week13>java Week13c.java
Note: Week13c.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.
```



```
Microsoft Windows [Version 10.0.19042.1165]
(c) Microsoft Corporation. All rights reserved.

C:\Users\hp>e:

E:\>cd "books and pdfs"

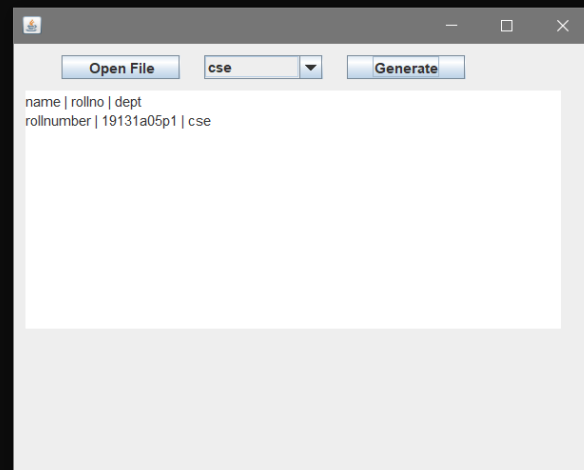
E:\books and pdfs>cd "sem4 pdfs"

E:\books and pdfs\sem4 pdfs>cd "java lab"

E:\books and pdfs\sem4 pdfs\java lab>cd week13

E:\books and pdfs\sem4 pdfs\java lab\week13>javac Week13c.java
Note: Week13c.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.

E:\books and pdfs\sem4 pdfs\java lab\week13>java Week13c.java
Note: Week13c.java uses unchecked or unsafe operations.
Note: Recompile with -Xlint:unchecked for details.
```



Week 14:

14a) Aim: For program 12) b) check all the fields filled or not, display success dialogue if all fields are filled with the help of ActionListener. Display respective error dialogue if a field is empty.

Code:

```
import java.awt.*;
import java.awt.event.*;
import javax.swing.*;

import java.awt.FlowLayout;
import javax.swing.JButton;
import javax.swing.JFrame;
import javax.swing.JLabel;
import javax.swing.JPanel;
import javax.swing.JOptionPane;
import javax.swing.JTextField;
import javax.swing.JTextArea;
import java.awt.event.ActionEvent;
import java.awt.event.ActionListener;
import javax.swing.JRadioButton;
import javax.swing.ButtonGroup;
import java.awt.GridBagLayout;
import java.awt.GridBagConstraints;

import javax.swing.border.Border;
import javax.swing.border.LineBorder;

public class Week14a{
    public static void main(String... arg){
        registration r1=new registration();
    }
}
class registration extends JFrame implements ActionListener{
    JTextField t1,t2,t3,t4,t5;
    JButton b1,b2,b;
    JRadioButton g1,g2;
    ButtonGroup g1g2;
    JLabel l1,l2,l3,l4,l5,l6,l7;
    GridBagConstraints gbc;
    JPanel j1,j2;
    JTextArea a1;
    // String branch[]={"cse","ece","eee","mech","civil"};
    // JComboBox br=new JComboBox(branch);
    public registration(){
```

```
setLayout(new GridBagLayout());

gbc=new GridBagConstraints();
l1=new JLabel("Your good Name");

gbc.gridx=0;
gbc.gridy=1;
add(l1,gbc);
t1=new JTextField(20);
gbc.gridx=1;
gbc.gridy= 1;
add(t1,gbc);

l2=new JLabel("Your Roll number");
gbc.gridx=0;
gbc.gridy=2;
add(l2,gbc);
t2=new JTextField(20);
gbc.gridx=1;
gbc.gridy= 2;
add(t2,gbc);

l3=new JLabel("Your Branch");
gbc.gridx=0;
gbc.gridy=3;
add(l3,gbc);
t3=new JTextField(20);
gbc.gridx=1;
gbc.gridy=3;
add(t3,gbc);

l4=new JLabel("Your Section");
gbc.gridx=0;
gbc.gridy=4;
add(l4,gbc);
t4=new JTextField(20);
gbc.gridx=1;
```

```
gbc.gridy= 4;  
add(t4,gbc);
```

```
l5=new JLabel("Your Mobile number");  
gbc.gridx=0;  
gbc.gridy=5;  
add(l5,gbc);  
t5=new JTextField(20);  
gbc.gridx=1;  
gbc.gridy= 5;  
add(t5,gbc);
```

```
l6=new JLabel("Your Gender");  
gbc.gridx=0;  
gbc.gridy=6;  
add(l6,gbc);
```

```
j1=new JPanel();  
j2=new JPanel();
```

```
g1=new JRadioButton("Male");  
g1g2=new ButtonGroup();  
g1g2.add(g1);
```

```
j1.add(g1);  
g2=new JRadioButton("Female");  
j1.add(g2);  
g1g2.add(g2);
```

```
gbc.gridx=1;  
gbc.gridy=6;  
add(j1,gbc);
```

```
l7=new JLabel("Your Address");  
gbc.gridx=0;  
gbc.gridy=7;  
add(l7,gbc);
```

```
a1=new JTextArea(10,20);
```

```
gbc.gridx=1;
gbc.gridy=7;
add(a1,gbc);

b1=new JButton("Submit");
j2.add(b1);
b2=new JButton("Clear");
j2.add(b2);
gbc.gridx=1;
gbc.gridy=8;
add(j2,gbc);
b1.addActionListener(this);
b2.addActionListener(this);
setVisible(true);
setSize(600,600);

setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
}
public void actionPerformed(ActionEvent ae){
    if(ae.getSource()==b1){
        String name=t1.getText();
        String roll_number=t2.getText();
        String branch=t3.getText();
        String Section=t4.getText();
        String Mobile=t5.getText();
        String address=a1.getText();
        int k=0;
        if(name.equals(""))
        {
            JOptionPane.showMessageDialog(null,"Name is mandatory.");
            k+=1;
        }
        if(roll_number.equals(""))
        {
            JOptionPane.showMessageDialog(null,"roll_number is
mandatory.");
            k+=1;
        }
        if(branch.equals(""))
        {
            JOptionPane.showMessageDialog(null,"branch is mandatory.");
            k+=1;
        }
    }
}
```

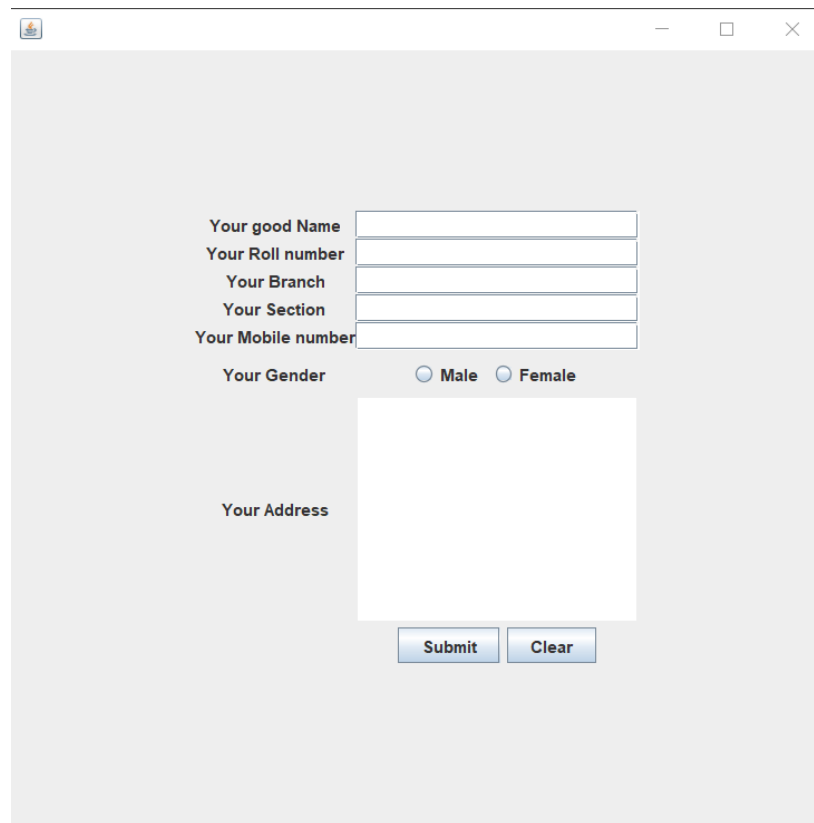
```
        if(Section.equals(""))
        {
            JOptionPane.showMessageDialog(null,"Section is mandatory.");
            k+=1;
        }
        if(Mobile.equals(""))
        {
            JOptionPane.showMessageDialog(null,"Mobile is mandatory.");
            k+=1;
        }
        if(address.equals(""))
        {
            JOptionPane.showMessageDialog(null,"address is mandatory.");
            k+=1;
        }
        if(!g1.isSelected() && !g2.isSelected())
        {
            JOptionPane.showMessageDialog(null,"Gender is mandatory.");
            k+=1;
        }
        if(k==0){
            JOptionPane.showMessageDialog(null,"Registration successful");
            // if(g1.isSelected()){
            //     name="Mr "+name;
            // }
            // else{
            //     name="Ms "+name;
            // }
        }
    }

    if(ae.getSource()==b2){
        t1.setText(null);
        t2.setText(null);
        t3.setText(null);
        t4.setText(null);
        t5.setText(null);
        a1.setText(null);
        g1g2.clearSelection();
    }

}
```

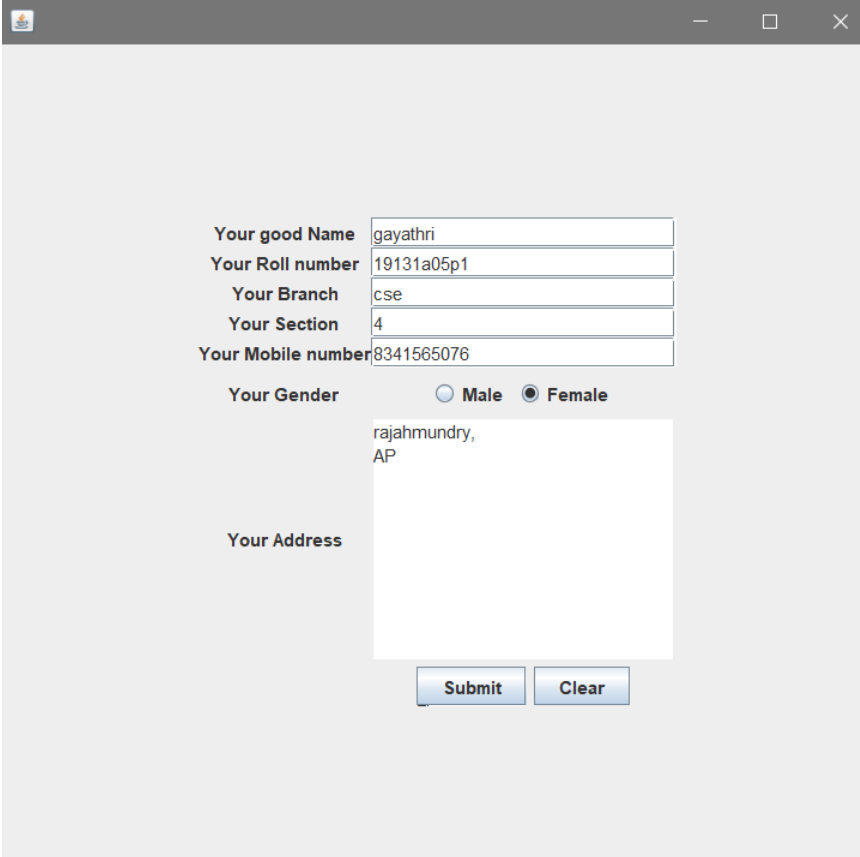
```
}
```

Output:



The screenshot shows a Java Swing window with a light gray background. The window contains a registration form with the following fields and controls:

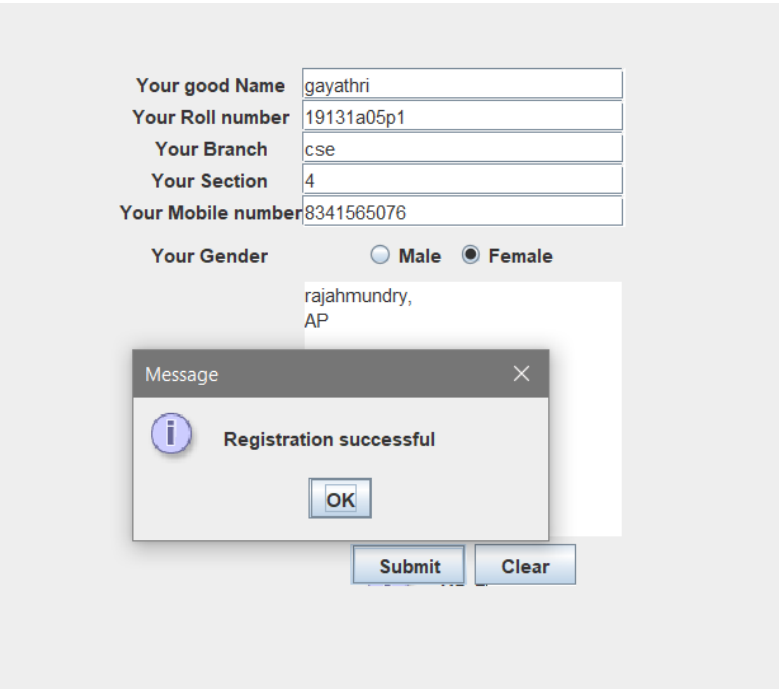
- Your good Name**: A text input field.
- Your Roll number**: A text input field.
- Your Branch**: A text input field.
- Your Section**: A text input field.
- Your Mobile number**: A text input field.
- Your Gender**: Two radio buttons labeled **Male** and **Female**.
- Your Address**: A large text area for input.
- Submit**: A button to submit the form.
- Clear**: A button to clear the form.



A screenshot of a web browser window displaying a registration form. The form contains the following fields and values:

- Your good Name: gayathri
- Your Roll number: 19131a05p1
- Your Branch: cse
- Your Section: 4
- Your Mobile number: 8341565076
- Your Gender: ☐ Male ☒ Female
- Your Address: rajahmundry, AP

At the bottom of the form are two buttons: "Submit" and "Clear".



A screenshot of the same registration form as above, but with a message box overlaid. The message box is titled "Message" and contains the text "Registration successful" with an information icon. Below the message is an "OK" button. The "Submit" and "Clear" buttons from the form are visible at the bottom.

Your good Name

Your Roll number

Your Branch

Your Section

Your Mobile number

Your Gender ☐ Male ☒ Female

Your Address

Your good Name

Your Roll number

Your Branch


Your Section

Your Mobile number

Your Gender ☐ Male ☒ Female

Your Address

Message

 Name is mandatory.

Your good Name

Your Roll number

Your Branch


Your Section

Your Mobile number

Your Gender ☐ Male ☒ Female

rajahmundry,
AP

Message

 Section is mandatory.

OK

Your good Name

Your Roll number

Your Branch

Your Section

Your Mobile number

Your Gender ☐ Male ☒ Female

rajahmundry,
AP

Your Address

Your good Name: gayathri

Your Roll number:

Your Branch: cse

Your Section: 4

Your Mobile number: 8341565076

Your Gender: ☐ Male ☒ Female

rajahmundry,
AP

Message

roll_number is mandatory.

OK

Submit Clear

14)b: Aim: Write a program to create three JSliders where each represents colors RED, GREEN and BLUE. Each slider has a value from 0 to 255. The background color of the applet is set based on the values retrieved from each slider to form a color using the color class constructor. On sliding any slider, the background color of applet changes.

Code:

```
import java.awt.*;
import java.awt.event.*;
import java.applet.*;
import javax.swing.event.*;
import javax.swing.*;
import javax.swing.border.Border;

public class Week14b extends Applet implements ChangeListener{

    JSlider j1,j2,j3;
    JLabel l1,l2,l3;
    Color c;
```

```
public void stateChanged(ChangeEvent e)
{
    setBackground(new
Color(j1.getValue(),j2.getValue(),j3.getValue()));
}

public void init(){
    j1=new JSlider(JSlider.HORIZONTAL,0,255,100);
    j2=new JSlider(JSlider.HORIZONTAL,0,255,100);
    j3=new JSlider(JSlider.HORIZONTAL,0,255,100);
    l1=new JLabel("R(red)");
    Border border = BorderFactory.createLineBorder(Color.black, 1);
    l1.setBorder(border);
    l1.setOpaque(true);
    l2=new JLabel("G(green)");
    l2.setBorder(border);
    l2.setOpaque(true);

    l3=new JLabel("B(blue)");
    l3.setBorder(border);
    l3.setOpaque(true);

    add(l1);
    add(j1);
    add(l2);
    add(j2);
    add(l3);
    add(j3);
    setLayout(new FlowLayout());
    j1.addChangeListener(this);
    j2.addChangeListener(this);
    j3.addChangeListener(this);
    setBackground(new
Color(j1.getValue(),j2.getValue(),j3.getValue()));

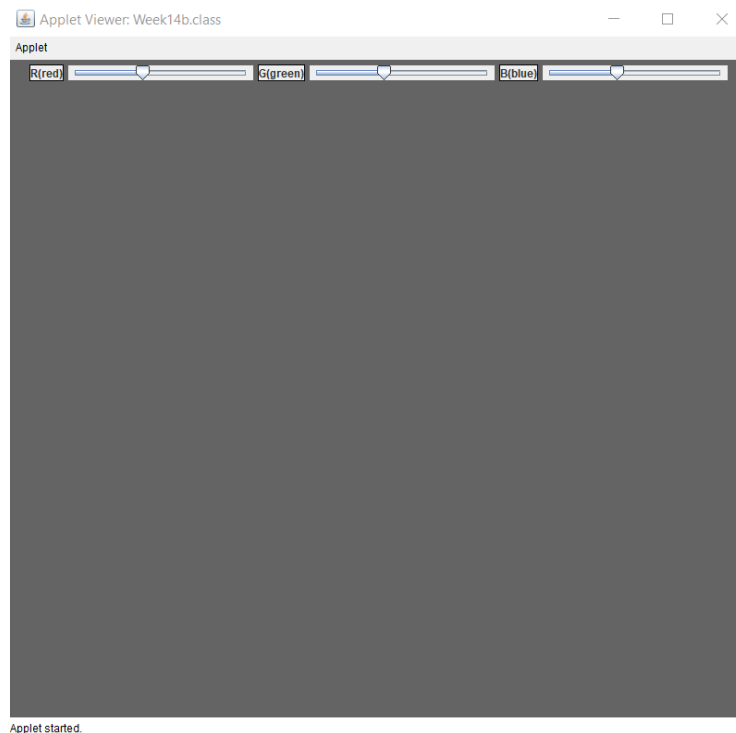
}
}
```

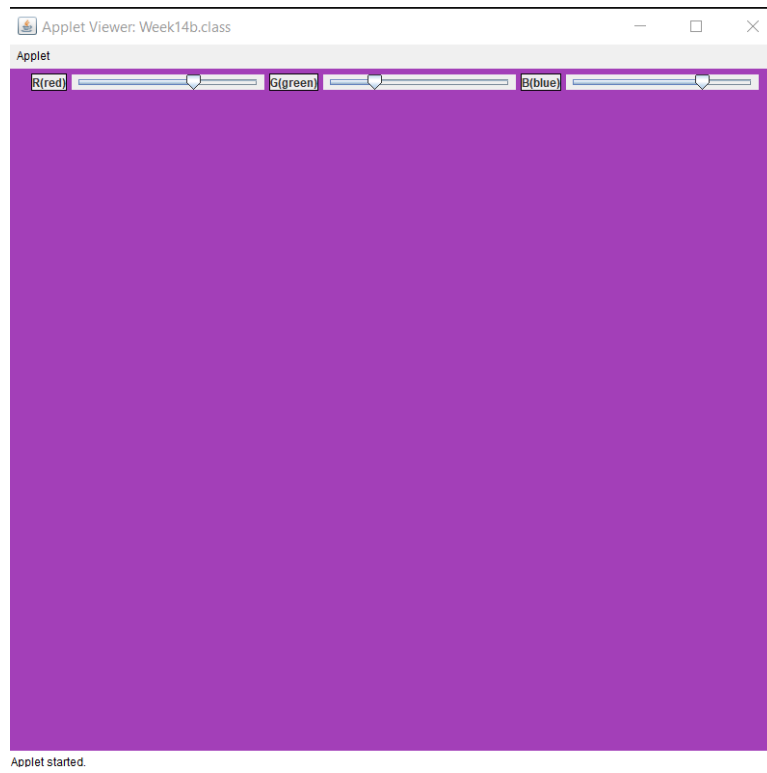
Slider.html

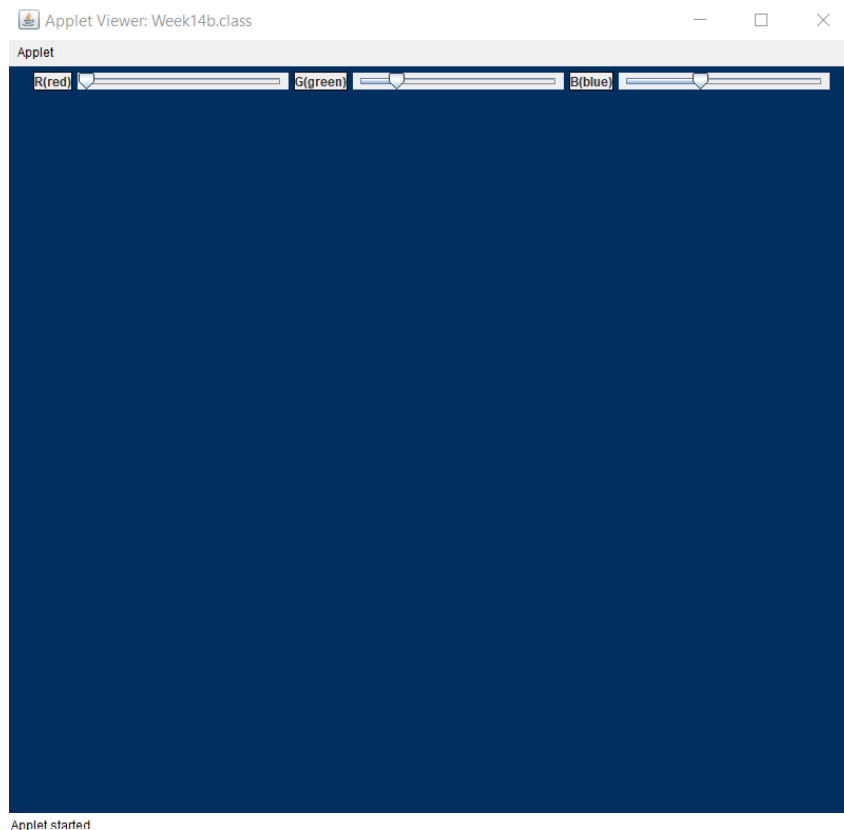
```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>Document</title>
</head>
<body>
  <applet code="Week14b.class" width=1000 height=1000></applet>
</body>
</html>
```

Output:

```
E:\books and pdfs\sem4 pdfs\java lab\week14>javac Week14b.java
E:\books and pdfs\sem4 pdfs\java lab\week14>appletviewer Slider.html
```





**Week 15:**

Aim: Write a program that implements a simple client/server application. The client sends data to a server. The server receives the data, uses it to produce a result, and then sends the result back to the client. The client displays the result on the console. For ex: The data sent from the client is the radius of a circle, and the result produced by the server is the area of the circle.

Server.java

```
import java.io.*;
import java.net.*;

public class Server{
    public static void main(String... arg) throws Exception {
        System.out.println("server is started");
        try{
            ServerSocket ss=new ServerSocket(6666);
            System.out.println("server is waiting for client request");
```

```
        while(true){

            Socket s=ss.accept();

            System.out.println("client connected");
            BufferedReader br=new BufferedReader(new
InputStreamReader(s.getInputStream()));
            String a=br.readLine();

            System.out.println("client radius: "+a);
            Double r=Double.parseDouble(a);
            Double area=2*3.14*r;
            OutputStreamWriter osw=new OutputStreamWriter(s.getOutputStream());
            PrintWriter out=new PrintWriter(osw);
            out.println(area);
            osw.flush();
        }
    }
    catch(Exception e){
        System.out.println(e);
    }
}
}
```

Client.java

```
import java.io.*;
import java.util.*;
import java.net.*;

public class Client{
    public static void main(String... arg) throws Exception{

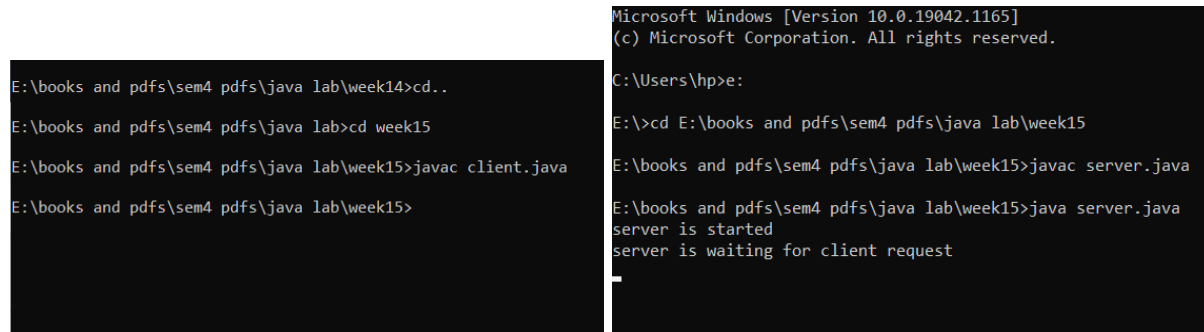
        String ip="localhost";
        int port=6666;
        Socket s=new Socket(ip,port);
        Scanner sc=new Scanner(System.in);
        float r=sc.nextInt();
        OutputStreamWriter osw=new OutputStreamWriter(s.getOutputStream());
        PrintWriter out=new PrintWriter(osw);
```



```
        out.println(r);
        osw.flush();

        BufferedReader br=new BufferedReader(new
InputStreamReader(s.getInputStream()));
        String a=br.readLine();
        System.out.println("Perimeter of circle is"+a);
    }
}
```

Output:

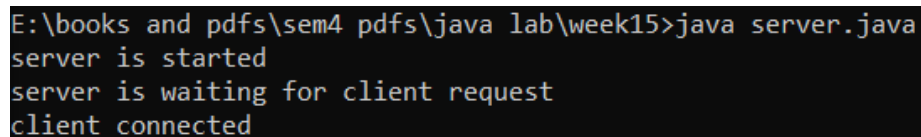


The image shows two terminal windows side-by-side. The left window shows the compilation of client.java and server.java. The right window shows the execution of server.java, which outputs 'server is started' and 'server is waiting for client request'.

```
E:\books and pdfs\sem4 pdfs\java lab\week14>cd..
E:\books and pdfs\sem4 pdfs\java lab>cd week15
E:\books and pdfs\sem4 pdfs\java lab\week15>javac client.java
E:\books and pdfs\sem4 pdfs\java lab\week15>

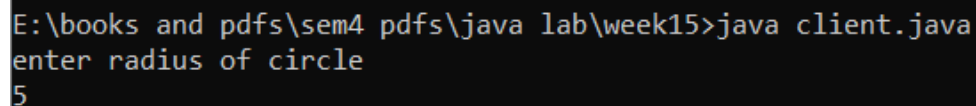
Microsoft Windows [Version 10.0.19042.1165]
(c) Microsoft Corporation. All rights reserved.

C:\Users\hp>e:
E:\>cd E:\books and pdfs\sem4 pdfs\java lab\week15
E:\books and pdfs\sem4 pdfs\java lab\week15>javac server.java
E:\books and pdfs\sem4 pdfs\java lab\week15>java server.java
server is started
server is waiting for client request
```



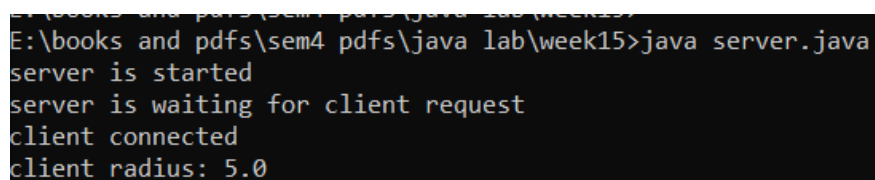
The terminal shows the execution of server.java, which outputs 'server is started' and 'server is waiting for client request'.

```
E:\books and pdfs\sem4 pdfs\java lab\week15>java server.java
server is started
server is waiting for client request
```



The terminal shows the execution of client.java, which prompts 'enter radius of circle' and receives the input '5'.

```
E:\books and pdfs\sem4 pdfs\java lab\week15>java client.java
enter radius of circle
5
```



The terminal shows the execution of server.java, which outputs 'server is started' and 'server is waiting for client request'. It then receives 'client connected' and 'client radius: 5.0' from the client.

```
E:\books and pdfs\sem4 pdfs\java lab\week15>java server.java
server is started
server is waiting for client request
client connected
client radius: 5.0
```

```
E:\books and pdfs\sem4 pdfs\java lab\week15>java client.java
enter radius of circle
5
Perimeter of circle is31.400000000000002
E:\books and pdfs\sem4 pdfs\java lab\week15>
```