Assigntment 1

SET A

1) Using javap, view the methods of the following classes from the lang package: java.lang.Object , java.lang.String and java.util.Scanner. and also Compile sample program 8. Type the following command and view the bytecodes. javap -c MyClass.

```
/***********************************************************/
public class MyClass
{
int num;
public MyClass()
{
num=0;
}
public MyClass(int num)
{
this.num = num;
}
public static void main(String[] args)
{
MyClass m1 = new MyClass();
if(args.length > 0)
{
int n = Integer.parseInt(args[0]);
MyClass m2 = new MyClass(n);
System.out.println(m1.num);
System.out.println(m2.num);
}
else
System.out.println("Insufficient arguments");
}
}
```

2) Write a program to calculate perimeter and area of rectangle.

(hint : area = length * breadth , perimeter=2*(length+breadth))

```java
import java.io.*;
class area
{
public static void main(String args[])
{
int a,b,c,d,perimeter,area;
a=c=5;
b=d=2;
area=a*b;
perimeter=2*(a+b);
System.out.println("Area of rectangle="+area);
System.out.println("Area of perimeter="+perimeter);
}
}
```

3) Write a menu driven program to perform the following operations

i. Calculate the volume of cylinder. (hint : Volume: $\pi \times r2 \times h$)

ii. Find the factorial of given number.

iii. Check the number is Armstrong or not.

iv. Exit

```java
import java.util.Scanner;

public class menudriven
{
public static void main(String[] args)
{
int choice;//for storing users choice
double radius;
double height;
double volume;
Scanner sc=new Scanner(System.in);//Creating object of the scanner class
//displaying the menu
System.out.println("1:Volume of cylinder");
System.out.println("2:Factorial of number");
System.out.println("3:Number is armstrong or not");
System.out.println("4:Exit");
lp : while(true)//labelling the while loop
{
System.out.println("Make your choice");
choice=sc.nextInt();//reading users choice
switch(choice)
{
case 1:
//take input from the user
//create an instance of the scanner class
Scanner s=new Scanner(System.in);
```

```java
System.out.println("Enter the radius:");
radius=s.nextDouble();
System.out.println("Enter the height:");
height=s.nextDouble();
volume=(22*(radius*radius)*height/7);
System.out.println("volume of cylinder is:"+volume);
break;
case 2:
Scanner a=new Scanner(System.in);
System.out.println("Enter the number:");
int num=a.nextInt();
int i=1,fact=1;
while(i<=num)
{
fact=fact*i;
i++;
}
System.out.println("Factorial of the number:"+fact);
break;
case 3:

int temp,totalDigit=0,res=0,rem,pow;
Scanner b=new Scanner(System.in);
System.out.println("Enter the number:");
num=b.nextInt();
temp=num;
while(num>0)
{
num=num/10;
totalDigit++;
```

```java
}
num=temp;
while(num>0)
{
rem=num%10;
pow=1;
i=0;
while(i<totalDigit)
{
pow=pow*rem;
i++;
}
res=res+pow;
num=num/10;
}
if(res==temp)
System.out.println("\n Armstrong number:");
else
System.out.println("\n Not an Armstrong number:");
break;
case 4:System.out.println("EXIT");
break;
}
}
}
}
```

4) Write a program to accept the array element and display in reverse order.

```
class ReverseArray
{
public static void main(String args[])
{
int a[]=new int[]{1,2,3,4,5};
{
System.out.println("Original array");
for(int i=0; i<a.length;i++)
{
System.out.println(a[i]);
}
System.out.println("Reverse Array");
for(int i=a.length-1;i>=0;i--)
{System.out.println(a[i]);

}
}
}
}
```

1) Write a java program to display the system date and time in various formats shown

below:Current date is : 31/08/2021

Current date is : 08-31-2021

Current date is : Tuesday August 31 2021

Current date and time is : Fri August 31 15:25:59 IST 2021

Current date and time is : 31/08/21 15:25:59 PM +0530

Current time is : 15:25:59

Current week of year is : 35

Current week of month : 5

Current day of the year is : 243

Note: Use java.util.Date and java.text.SimpleDateFormat class

```
import java.text.ParseException;

import java.text.SimpleDateFormat;

import java.util.Date;

import java.util.Locale;

public class Newclass {

public static void main(String[] args) {

Date date = new Date();

SimpleDateFormat formatter = new SimpleDateFormat("dd/MM/yyyy");

String strDate = formatter.format(date);

System.out.println("Current date is: "+strDate);

formatter = new SimpleDateFormat("MM-dd-yyyy");

strDate = formatter.format(date);

System.out.println("Current date is: "+strDate);

formatter = new SimpleDateFormat("EEEEEE MMMM dd yyyy");

strDate = formatter.format(date);

System.out.println("Current date is: "+strDate);

formatter = new SimpleDateFormat("E MMMM dd HH:mm:ss z yyyy");

strDate = formatter.format(date);

System.out.println("Current date and time is: "+strDate);
```

```java
formatter = new SimpleDateFormat("dd/MM/yy HH:mm:ss a Z");

strDate = formatter.format(date);

System.out.println("Current date and time is: "+strDate);

formatter = new SimpleDateFormat("hh:mm:ss");

strDate = formatter.format(date);

System.out.println("Current time is: "+strDate);

formatter = new SimpleDateFormat("w");

strDate = formatter.format(date);


System.out.println("Current week of year is: "+strDate);

formatter = new SimpleDateFormat("W");

strDate = formatter.format(date);

System.out.println("Current week of the month is: "+strDate);

formatter = new SimpleDateFormat("D");

strDate = formatter.format(date);

System.out.println("Current day of the year: "+strDate);
}
}
```

2) Define a class MyNumber having one private int data member. Write a default constructor to initialize it to 0 and another constructor to initialize it to a value (Use this). Write methods isNegative, isPositive, isZero, isOdd, isEven. Create an object in main. Use command line arguments to pass a value to the object (Hint : convert string argument to integer) and perform the above tests. Provide javadoc comments for all constructors and methods and generate the html help file.

```
public class MyNumber
{
private int x;
public MyNumber()
{
x=0;
}
public MyNumber(int x)
{
this.x=x;
}
public boolean isNegative()
{
if(x<0)
return true;
else return false;
}
public boolean isPositive()
{
if(x>0)
return true;
else return false;
```

```java
}
public boolean isZero()
{
if(x==0)
return true;
else return false;
}
public boolean isOdd()
{
if(x%2!=0)
return true;

else return false;
}
public boolean isEven()
{
if(x%2==0)
return true;
else return false;
}
public static void main(String [] args) throws ArrayIndexOutOfBoundsException
{
int x=Integer.parseInt(args[0]);
MyNumber m=new MyNumber(x);
if(m.isNegative())
System.out.println("Number is Negative");
if(m.isPositive())
System.out.println("Number is Positive");
if(m.isEven())
System.out.println("Number is Even");
```

```java
if(m.isOdd())
System.out.println("Number is Odd");
if(m.isZero())
System.out.println("Number is Zero");
 }
}
```

3) Write a menu driven program to perform the following operations on multidimensional array ie matrix :

i. Addition

ii. Multiplication

iii. Transpose of any matrix.

iv. Exit

```java
import java.util.Scanner;

public class multidimensional{

public static void main(String args[])

{

//Scanner class to take input

Scanner scan = new Scanner(System.in);

int row, col;

int mat1[][] = new int[3][3];

int mat2[][] = new int[3][3];

//Entering first matrix

System.out.println("Enter the 3x3 matrix elements for 1st matrix : ");

// Loop to take array elements as user input for first matrixn i.e mat1

for(row=0;row<3;row++)

for(col=0;col<3;col++)

mat1[row][col] = scan.nextInt();

//print the elements of first matrix i.e mat1


System.out.print("1st matrix : ");

for(row=0;row<3;row++)

{

// Used for formatting

System.out.print("\n");
```

```java
for(col=0;col<3;col++)

{

System.out.print(mat1[row][col]+" ");

}

}

//Entering second matrix

System.out.println("\nEnter the 3x3 matrix elements for 2nd matrix : ");

// Loop to take array elements as user input for second matrix

for(row=0;row<3;row++)

for(col=0;col<3;col++)

mat2[row][col] = scan.nextInt();

//print the elements of second matrix i.e mat2

System.out.print("2nd matrix : ");

for(row=0;row<3;row++)

{

// Used for formatting

System.out.print("\n");

for(col=0;col<3;col++)

{

System.out.print(mat2[row][col]+" ");

}

}

int res[][] = new int[3][3], operationHolder = 0;

int choice ;

while(true)

{

//Prints the menu to choose operation from

System.out.println("\n\nBASIC MATRIX OPERATIONS");

System.out.println("_____");

System.out.println("1. Addition of two matrices");
```

```java
System.out.println("2. Subtraction of two matrices");
System.out.println("3. Multiplication of two matrices");
System.out.println("4. Transpose");
System.out.println("5. Exit");
System.out.println("_____");
System.out.println("Enter your choice : ");
choice = scan.nextInt();
// Switch cases to run the menu
switch(choice)
{
case 1: res = add(mat1,mat2);
System.out.println("After add operation");
printMatrix(res);
break;
case 2: res = sub(mat1,mat2);
System.out.println("After subtract operation");

printMatrix(res);
break;
case 3: res = prod(mat1,mat2);
System.out.println("After multiply operation");
printMatrix(res);
break;
case 4: res = trans(mat1);
System.out.println("After transpose operation");
printMatrix(res);
break;
case 5: System.out.println("Exited from the program");
return;
default: System.out.println("Wrong input, please try again!!");
```

```java
        }
    }
}
// Function to print the matrix
static void printMatrix(int arr[][])
{
int row, col;
System.out.print("The array elements are : ");
// Loop to print the elements
for(row=0;row<3;row++)
{
// Used for formatting
System.out.print("\n");
for(col=0;col<3;col++)
{
System.out.print(arr[row][col]+" ");
}
}
}
// Function to calculate the sum
static int[][] add(int[][] mat1,int[][] mat2)
{
int row, col, add[][] = new int[3][3];
for(row=0;row<3;row++)
for(col=0;col<3;col++)
add[row][col] = mat1[row][col]+mat2[row][col];
return add;
}
// Function to calculate the difference
static int[][] sub(int[][] mat1,int[][] mat2)
```

```java
{
int row, col, sub[][] = new int[3][3];
for(row=0;row<3;row++)
for(col=0;col<3;col++)
sub[row][col] = mat1[row][col]-mat2[row][col];
return sub;
}
// Function to calculate the product

static int[][] prod(int[][] mat1,int[][] mat2)
{
int row, col, prod[][] = new int[3][3];
for(row=0;row<3;row++)
for(col=0;col<3;col++)
{
// Initializes the array element to zero first
prod[row][col] = 0;
for(int i = 0; i<3; i++)
prod[row][col]+=mat1[row][i]*mat2[i][col];
}
return prod;
}
// Function to find the transpose
static int[][] trans(int[][] mat)
{
int row, col, trans[][] = new int[3][3];
for(row=0;row<3;row++)
for(col=0;col<3;col++)
trans[row][col] = mat[col][row];
return trans;
```

```
    }

    }
```

Assignment 2

SET A

1) Create an employee class(id,name,deptname,salary). Define a default and parameterized constructor. Use 'this' keyword to initialize instance variables. Keep a count of objects created. Create objects using parameterized constructor and display the object count after each object is created.(Use static member and method). Also display the contents of each object.

```
import java.util.Scanner;

public class Employee {

int id;

String name;

String deptname;

float salary;

static int numberofobjects=0;

Employee(){

id=0;

name="";

deptname="";

salary=0;

}

Employee(int id,String name,String deptname,float salary ){

this.id=id;

this.name=name;

this.deptname=deptname;

this.salary=salary;

numberofobjects++;

}

public void display(){

System.out.println("Employee Id :"+id);

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

System.out.println("Employee Department: "+deptname);

System.out.println("Employee Salary :"+salary);

}
```

```java
public static void main(String[] args){
int n=0;
Scanner sc=new Scanner(System.in);
System.out.print("How many employees you want to enter :");
n=sc.nextInt();
Employee[] ob=new Employee[n];
for(int i=0;i<n;i++){
sc= new Scanner(System.in);
System.out.println("Enter Id of employee "+(i+1)+" :");
int id=sc.nextInt();
System.out.println("Enter Name of employee "+(i+1)+" :");
sc.nextLine();
String name= sc.nextLine();
System.out.println("Enter dept name of employee "+(i+1)+" :");
String deptname=sc.nextLine();
System.out.println("Enter salary of employee "+(i+1)+" :");
float salary = sc.nextFloat();
ob[i]=new Employee(id,name,deptname,salary);
System.out.println("\nNumber of Objects : "+numberofobjects);


}
for(int i=0;i<n;i++)
{
ob[i].display();
}
}
}
```

2) Define Student class(roll_no, name, percentage) to create n objects of the Student class. Accept details from the user for each object. Define a static method "sortStudent" which sorts the array on the basis of percentage.

```
import java.io.BufferedReader;

import java.io.IOException;

import java.io.InputStreamReader;

class Student

{

int rollno;

String name;

float per;

static int count;

Student(){}

Student(String n,float p)

{

count++;

rollno=count;

name=n;

per=p;

}

void display()

{

System.out.println(rollno+"\t"+name+"\t"+per);

}

float getper()

{

return per;

}

static void counter()

{

System.out.println(count+" object is created");
```

```java
}
public static void sortStudent(Student s[],int n)
{
for(int i=n-1;i>=0;i--)
{
for(int j=0;j<i;j++)
{
if(s[j].getper()>s[j+1].getper())

{
Student t=s[j];
s[j]=s[j+1];
s[j+1]=t;

}
}
}
for(int i=0;i<n;i++)
s[i].display();
}
}
class Studentclass
{
public static void main(String args[]) throws IOException
{
BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
System.out.println("Enter no. of Student:");
int n=Integer.parseInt(br.readLine());
Student p[]=new Student[n];
for(int i=0;i<n;i++)
{
```

```java
System.out.print("Enter Name:");

String name=br.readLine();

System.out.print("Enter percentage:");

float per=Float.parseFloat(br.readLine());

p[i]=new Student(name,per);

p[i].counter();


}

Student.sortStudent(p,Student.count);

}

}
```

3) Write a java program to accept 5 numbers using command line arguments sort and display them.

```java
import java.io.*;

class sort
{
public static void main(String[] args) throws IOException
{
BufferedReader br= new BufferedReader(new InputStreamReader(System.in));

int [] arr=new int[5];

for(int i=0;i<5;i++) //Array Initialization
{
arr[i]=Integer.parseInt(br.readLine());
}

int temp = 0; //Temporary variable to store the element

for (int i = 0; i < 5; i++) //Holds each Array element
{
for (int j = i+1; j < 5; j++) //compares with remaining Array elements
{
if(arr[i] > arr[j]) //Compare and swap

{
temp = arr[i];
arr[i] = arr[j];
arr[j] = temp;
}
}
}
System.out.println();
//Displaying elements of array after sorting
System.out.println("Elements of array sorted in ascending order: ");
for (int i = 0; i < 5; i++)
```

```java
{
System.out.print(arr[i] + " ");
}
}
}
```

4) Write a java program that take input as a person name in the format of first, middle and last name and then print it in the form last, first and middle name, where in the middle name first character is capital letter.

```java
import java.util.*;
class person
{
String fname,mname,lname;
int len;
void accept()
{
System.out.println("Enter First Name :");
Scanner s=new Scanner(System.in);
fname=s.next();
System.out.println("Enter Middle Name :");

mname=s.next();
System.out.println("Enter Last Name :");

lname=s.next();

len=mname.length();
String f=mname.substring(0,1);
String l=mname.substring(1,len);
f=f.toUpperCase();
mname=f+l;

}

void display()
{
System.out.println("Last Name :"+lname);
```

```java
System.out.println("First Name :"+fname);

System.out.println("Middle Name :"+mname);


}


public static void main(String a[])

{

person p=new person();

p.accept();

p.display();

}

}
```

Assignment 2
SET B

1) Write a Java program to create a Package "SY" which has a class SYMarks (members – ComputerTotal, MathsTotal, and ElectronicsTotal). Create another package TY which has a class TYMarks (members – Theory, Practicals). Create n objects of Student class (having rollNumber, name, SYMarks and TYMarks). Add the marks of SY and TY computer subjects and calculate the Grade ('A' for >= 70, 'B' for >= 60 'C' for >= 50 , Pass Class for > =40 else 'FAIL') and display the result of the student in proper format.

```
/*******************************************************************/
package Assignment2.SY;
import java.io.BufferedReader;
import java.io.*;
public class SYClass {
public int ct,mt,et;
public void get() throws IOException{
System.out.println("Enter marks of students for computer, maths and electronics subject out of 200
");
BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
ct=Integer.parseInt(br.readLine());
mt=Integer.parseInt(br.readLine());
et=Integer.parseInt(br.readLine());
}
}
/*****************************************************************/
package Assignment2.TY;
import java.io.*;
public class TYClass {
public int tm,pm;
public void get() throws IOException{
System.out.println("Enter the marks of the theory out of 400 and practicals out of 200: ");
BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
tm=Integer.parseInt(br.readLine());
```

```java
pm=Integer.parseInt(br.readLine());

}

}

/************************************************************/

package Assignment2;

import Assignment2.SY.*;

import Assignment2.TY.*;

import java.io.*;

class StudentInfo{

int rollno;

String name,grade;

public float gt,tyt,syt;

public float per;

public void get() throws IOException{

System.out.println("Enter roll number and name of the student: ");

BufferedReader br=new BufferedReader(new InputStreamReader(System.in));

rollno=Integer.parseInt(br.readLine());

name=br.readLine();

}

}

public class StudentMarks {

public static void main(String[] args) throws IOException{

BufferedReader br=new BufferedReader(new InputStreamReader(System.in));

System.out.println("Enter the number of students:");

int n=Integer.parseInt(br.readLine());

SYClass sy[]=new SYClass[n];

TYClass ty[]=new TYClass[n];

StudentInfo si[]=new StudentInfo[n];

for(int i=0;i<n;i++)

{

si[i]=new StudentInfo();
```

```java
sy[i]=new SYClass();

ty[i]=new TYClass();

si[i].get();

sy[i].get();

ty[i].get();

si[i].syt=sy[i].ct+sy[i].et+sy[i].mt;

si[i].tyt=ty[i].pm+ty[i].tm;

si[i].gt=si[i].syt+si[i].tyt;

si[i].per=(si[i].gt/1200)*100;

if(si[i].per>=70) si[i].grade="A";

else if(si[i].per>=60) si[i].grade="B";

else if(si[i].per>=50) si[i].grade="C";

else if(si[i].per>=40) si[i].grade="Pass";

else si[i].grade="Fail";


}
System.out.println("Roll No\tName\tSyTotal\tTyTotal\tGrandTotal\tPercentage\tGrade");
for(int i=0;i<n;i++)
{
System.out.println(si[i].rollno+"\t"+si[i].name+"\t"+si[i].syt+"\t"+si[i].tyt+"\t"+si[i].gt+"\t\t"+si[i].per+"\t\t"+si[i].grade);
}
}
}
```

2) Define a class CricketPlayer (name,no_of_innings,no_of_times_notout, totatruns, bat_avg). Create an array of n player objects .Calculate the batting average for each player using static method avg(). Define a static sort method which sorts the array on the basis of average. Display the player details in sorted order.

```java
import java.io.*;
class Cricket
{
String name;
int inning, tofnotout, totalruns;
float batavg;
public Cricket()
{
name=null;
inning=0;
tofnotout=0;
totalruns=0;
batavg=0;
}
public void get() throws IOException
{
BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
System.out.println("Enter the name, no of innings, no of times not out, total runs: ");
name=br.readLine();
inning=Integer.parseInt(br.readLine());
tofnotout=Integer.parseInt(br.readLine());
totalruns=Integer.parseInt(br.readLine());
}
public void put()
{
System.out.println("Name="+name);
System.out.println("no of innings="+inning);
```

```java
System.out.println("no times notout="+tofnotout);

System.out.println("total runs="+totalruns);

System.out.println("bat avg="+batavg);

}

static void avg(int n, Cricket c[])

{

try

{

for(int i=0;i<n;i++)

{

c[i].batavg=c[i].totalruns/c[i].inning;

}

}

catch(ArithmeticException e)

{

System.out.println("Invalid arg");

}

}

static void sort(int n, Cricket c[]){

String temp1;

int temp2,temp3,temp4;

float temp5;

for(int i=0;i<n;i++)

{

for(int j=i+1;j<n;j++)

{

if(c[i].batavg<c[j].batavg)

{

temp1=c[i].name;

c[i].name=c[j].name;
```

```java
c[j].name=temp1;

temp2=c[i].inning;

c[i].inning=c[j].inning;

c[j].inning=temp2;

temp3=c[i].tofnotout;

c[i].tofnotout=c[j].tofnotout;

c[j].tofnotout=temp3;

temp4=c[i].totalruns;

c[i].totalruns=c[j].totalruns;

c[j].totalruns=temp4;

temp5=c[i].batavg;

c[i].batavg=c[j].batavg;

c[j].batavg=temp5;

}

}

}

}

}

class calculate

{

public static void main(String args[])throws IOException

{

BufferedReader br=new BufferedReader(new InputStreamReader(System.in));

System.out.println("Enter the limit:");

int n=Integer.parseInt(br.readLine());

Cricket c[]=new Cricket[n];

for(int i=0;i<n;i++)

{

c[i]=new Cricket();

c[i].get();

}
```

```
Cricket.avg(n,c);

Cricket.sort(n, c);

for(int i=0;i<n;i++){

c[i].put();

}

}

}
```

1) Write a program for multilevel inheritance such that country is inherited from

continent. State is inherited from country. Display the place, state, country

and continent.

```java
import java.io.InputStreamReader;

import java.io.BufferedReader;

import java.io.IOException;

class Continent

{

String con;

InputStreamReader i = new InputStreamReader(System.in);

BufferedReader r = new BufferedReader(i);

void con_input() throws IOException

{

System.out.println("Enter Continent Name: ");

con = r.readLine();

}

}

class Country extends Continent

{

String cou ;

void cou_input() throws IOException

{

System.out.println("Enter Country Name: ");

cou = r.readLine();

}

}

class State extends Country

{

String sta;

void sta_input() throws IOException

{
```

```java
System.out.println("Enter State Name: ");

sta = r.readLine();

}

}

class Main extends State

{

String pla;

void pla_input()throws IOException

{

System.out.println("Enter Place Name : ");

pla = r.readLine();

}

public static void main( String argsp[] )throws IOException

{

Main s = new Main();


s.con_input();

s.cou_input();

s.sta_input();

s.pla_input();

System.out.println("\n\nContinent: "+s.con);

System.out.println("Country: "+s.cou);

System.out.println("State: "+s.sta);

System.out.println("Place :" + s.pla);

}

}
```

2) Define an abstract class Staff with protected members id and name. Define a parameterized constructor. Define one subclass OfficeStaff with member department. Create n objects of OfficeStaff and display all details.

```java
import java.io.BufferedReader;
import java.io.IOException;
import java.io.InputStreamReader;
abstract class Staff{
String name,address;
}
class FullTimeStaff extends Staff{
String department;
double salary;
public void accept() throws IOException{
System.out.println("Enter the name, address, department and salary: ");
BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
name=br.readLine();
address=br.readLine();
department=br.readLine();
salary=Double.parseDouble(br.readLine());
}
public void display(){
System.out.println("Name: "+name);
System.out.println("Address: "+address);
System.out.println("Department: "+department);
System.out.println("Salary: "+salary);
System.out.println("---------------------");
}
}
class PartTimeStaff extends Staff{
int hours, rate;
```

```java
public void accept() throws IOException{

System.out.println("Enter the name, address, No of working hours and rate per hour: ");

BufferedReader br=new BufferedReader(new InputStreamReader(System.in));

name=br.readLine();

address=br.readLine();

hours=Integer.parseInt(br.readLine());

rate=Integer.parseInt(br.readLine());

}


public void display(){

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

System.out.println("Address: "+address);

System.out.println("No of Working Hours: "+hours);

System.out.println("Rate per hour: "+rate);

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

}

}

class stafftime{

public static void main(String [] args) throws IOException{

int i;

System.out.println("Select Any One: ");

BufferedReader br=new BufferedReader(new InputStreamReader(System.in));

System.out.println("1.Full Time Staff");

System.out.println("2.Part Time Satff");

int ch=Integer.parseInt(br.readLine());

switch(ch){

case 1:

System.out.println("Enter the number of Full Time Staff: ");

int n=Integer.parseInt(br.readLine());

FullTimeStaff [] l=new FullTimeStaff[n];

for(i=0;i<n;i++){
```

```java
l[i]=new FullTimeStaff();

l[i].accept();

}

for(i=0;i<n;i++){

l[i].display();

}

break;

case 2:

System.out.println("Enter the number of Part Time Staff: ");

int m=Integer.parseInt(br.readLine());

PartTimeStaff [] h=new PartTimeStaff[m];

for(i=0;i<m;i++){

h[i]=new PartTimeStaff();

h[i].accept();

}

for(i=0;i<m;i++){

h[i].display();

}

break;

}

}

}
```

Assignment 3

SET B

1) Create an abstract class "order" having members id,description.Create two subclasses "Purchase Order" and "Sales Order" having members customer name and Vendor name respectively.Define methods accept and display in all cases. Create 3 objects each of Purchase Order and Sales Order and accept and display details.

```java
import java.io.BufferedReader;
import java.io.IOException;
import java.io.InputStreamReader;
abstract class Order{
String id,description;
}
class PurchaseOrder extends Order{
String Customername,Vendorname;
public void accept() throws IOException{
System.out.println("Enter the id,description,names of customers and vendors: ");
BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
id=br.readLine();
description=br.readLine();
Customername=br.readLine();
Vendorname=br.readLine();
}
public void display(){
System.out.println("id: "+id);
System.out.println("Description: "+description);
System.out.println("Customername: "+Customername);
System.out.println("Vendorname: "+Vendorname);
System.out.println("---------------------");
}
}
class SalesOrder extends Order{
String Customername,Vendorname;
public void accept() throws IOException{
System.out.println("Enter the id,description,names of customers and vendors: ");
BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
id=br.readLine();
description=br.readLine();
Customername=br.readLine();
Vendorname=br.readLine();
}
public void display(){
System.out.println("id: "+id);
System.out.println("Description: "+description);
System.out.println("Customername: "+Customername);
System.out.println("Vendorname: "+Vendorname);
System.out.println("---------------------");
}
}
class Main {
public static void main(String [] args) throws IOException{
```

```java
int i;
System.out.println("Select Any One: ");
BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
System.out.println("1.Purchase Order");
System.out.println("2.Sales Order");
int ch=Integer.parseInt(br.readLine());
switch(ch){
case 1:
System.out.println("Enter the number of purchase Orders: ");
int n=Integer.parseInt(br.readLine());
PurchaseOrder [] l=new PurchaseOrder[n];
for(i=0;i<n;i++){
l[i]=new PurchaseOrder();
l[i].accept();
}
for(i=0;i<n;i++){
l[i].display();
System.out.println ("Object is created");
}
break;
case 2:
System.out.println("Enter the number of sales orders: ");
int m=Integer.parseInt(br.readLine());
SalesOrder [] h=new SalesOrder[m];
for(i=0;i<m;i++){
h[i]=new SalesOrder();
h[i].accept();
}
for(i=0;i<m;i++){
h[i].display();
System.out.println(" Object is created ");
}
}
}
}
```

3) Write a program to using marker interface create a class product(product_id, product_name, product_cost, product_quantity) define a default and parameterized constructor. Create objects of class product and display the contents of each object and Also display the object count.

```java
import java.util.Scanner;
 class Product implements Cloneable
{
int pid;
String pname;
double pcost;
//Product class constructor
public Product (int pid, String pname, double pcost)
{
this.pid = pid;
this.pname = pname;
this.pcost = pcost;
}
//method that prints the detail on the console
public void showDetail()
{
System.out.println("Product ID: "+pid);
System.out.println("Product Name: "+pname);
System.out.println("Product Cost: "+pcost);
}
public static void main (String args[]) throws CloneNotSupportedException
{
//reading values of the product from the user
Scanner sc = new Scanner(System.in);
System.out.print("Enter product ID: ");
int pid = sc.nextInt();
System.out.print("Enter product name: ");
String pname = sc.next();
System.out.print("Enter product Cost: ");
double pcost = sc.nextDouble();
System.out.println("-------Product Detail--------");
Product p1 = new Product(pid, pname, pcost);
//cloning the object of the Product class using the clone() method
Product p2 = (Product) p1.clone();
//invoking the method to print detail
p2.showDetail();
}
}
```

1) Define a class patient (patient_name, patient_age, patient_oxy_level,patient_HRCT_report). Create an object of patient. Handle appropriate exception while patient oxygen level less than 95% and HRCT scan report greater than 10, then throw user defined Exception "Patient is Covid Positive(+) and Need to Hospitalized" otherwise display its information.

```java
import java.io.*;
class CovidException extends Exception{
public CovidException(){
System.out.println("Patient is Covid Positive and needs to be hospitalized");
}
}
class Patient{
String name;
int age;
double level,hrct;
public Patient(String name,int age,double level,double hrct)
{
this.name=name;
this.age=age;
this.level=level;
this.hrct=hrct;
}
public static void main(String[] args)throws IOException
{
String name;
int age;
double level,hrct;
BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
System.out.println("Enter name: ");
name=br.readLine();
System.out.println("Enter the age: ");
age=Integer.parseInt(br.readLine());
System.out.println("Oxygen level: ");
level=Double.parseDouble(br.readLine());
System.out.println("HRCT report: ");
hrct=Double.parseDouble(br.readLine());
Patient ob=new Patient(name,age,level,hrct);
try{
if(ob.level<95 && ob.hrct>10)

throw new CovidException();

else
System.out.println("Patient Info: \n"+"Name: "+ob.name+"\nAge: "+ob.age+"\nHRCT report: "+ob.hrct+"\nOxygen level:"
+ob.level);
}catch(CovidException e){
}
}}
```

2) Write a program to read a text file "sample.txt" and display the contents of a file in reverse order and also original contents change the case (display in upper case).

```java
/*Seta2*/
import java.io.*;
import java.util.*;
class SetAq2
{
public static void main(String[] args)throws IOException
{
FileReader file=new FileReader("a.txt");
Scanner sc=new Scanner(file);
String s;
while(sc.hasNext())
{
StringBuffer sb=new StringBuffer();
s=sc.next();
String s1=s.toUpperCase();
sb.append(s1);
sb.reverse();
System.out.println(sb);
}
}
}
```

3) Accept the names of two files and copy the contents of the first to the second. First file having Book name and Author name in file. Second file having the contents of First file and also add the comment 'end of file' at the end.

```java
/SetA3*/
import java.io.*;
import java.util.*;
class Seta3{
public static void main(String[] args)throws IOException
{
int c;
String f1,f2;
Scanner sc=new Scanner(System.in);
System.out.println("Enter name of first file: ");
f1=sc.next();
System.out.println("Enter name of second file: ");
f2=sc.next();
FileReader fr=new FileReader(f1);
FileWriter fw=new FileWriter(f2,true);
while((c=fr.read())!=-1)
{
fw.write(c);
}
fw.append("\nEND OF FILE");
fr.close();
fw.close();
}
}
```

Assignment 4

SET B

1) Write a program to read book information (bookid, bookname, bookprice, bookqty) in file "book.dat". Write a menu driven program to perform the following operations using Random access file:
i. Search for a specific book by name.
ii. Display all book and total cost

```java
/*Setb1*/
import java.io.*;
import java.util.*;
class Setb1{
public static void main(String[] args)throws IOException
{
String name,line;
int cost=0,ch,flag=0,i,tcost=0;
BufferedReader br=new BufferedReader(new InputStreamReader(System.in));
File f=new File("book.dat");
RandomAccessFile rf=new RandomAccessFile(f,"rw");
do{
System.out.println("MENU");
System.out.println("1.Search\n2.Display book and total cost");
System.out.println("Enter your choice: ");
ch=Integer.parseInt(br.readLine());
switch(ch)
{
case 1:
rf.seek(0);
System.out.println("Enter book name to search: ");
name=br.readLine();
while(rf.getFilePointer()!=f.length())
{
line=rf.readLine();
String a[]=line.split(" ");
if(a[1].equals(name))
{
System.out.println("Book available");
flag=1;
break;
}
else
flag=2;
}
if(flag==2)
System.out.println("Book Unavailable");
break;
case 2:
rf.seek(0);
while(rf.getFilePointer()!=f.length())
{
line=rf.readLine();
String a[]=line.split(" ");
```

```java
cost=cost+(Integer.parseInt(a[2])*Integer.parseInt(a[3]));
System.out.println(a[1]+"\t"+cost);
tcost=tcost+(Integer.parseInt(a[2])*Integer.parseInt(a[3]));
}
System.out.println("Total cost\t"+tcost);
break;
}
}while(ch!=2);
}
}
```

2) Define class EmailId with members ,username and password. Define default and parameterized constructors. Accept values from the command line Throw user defined exceptions – "InvalidUsernameException" or "InvalidPasswordException" if the username and password are invalid.

```java
import java.io.*;
class InvalidUsernameException extends Exception{
public InvalidUsernameException(){
System.out.println("Invalid Username");
}
}
class InvalidPasswordException extends Exception{
public InvalidPasswordException(){
System.out.println("Invalid Password");
}
}
class EmailId{
String uname,pwd;
public EmailId()
{
uname="";
pwd="";
}
public EmailId(String uname,String pwd)
{
this.uname=uname;
this.pwd=pwd;
}
public static void main(String[] args)
{
String uname,pwd;
uname=args[0];
pwd=args[1];
EmailId ob=new EmailId(uname,pwd);
try{
if(("preranasherla").equals(ob.uname))
System.out.println("Valid Username");
else
throw new InvalidUsernameException();
}catch(InvalidUsernameException e){ }
try{
if(("prerana1234").equals(ob.pwd))
System.out.println("Valid Password");
else
throw new InvalidPasswordException();
}catch(InvalidPasswordException e1){ }
}
}
```

3) Define a class MyDate (day, month, year) with methods to accept and display a MyDate object. Accept date as dd, mm, yyyy. Throw user defined exception "InvalidDateException" if the date is invalid.
Examples of invalid dates : 03 15 2019, 31 6 2000, 29 2 2021

```java
import java.io.*;
class invaliddateexception extends Exception
{
invaliddateexception(int n)
{
System.out.println("The given date is invalid");
}
}
class invalidmonthexception extends Exception
{
invalidmonthexception(int m)
{
System.out.println("The given month is invalid");
}
}
class Date
{
public static void main(String args[])
{

int dd=Integer.parseInt(args[0]);
int mm=Integer.parseInt(args[1]);
long yy=Long.parseLong(args[2]);
try
{
if(mm<1||mm>12)
throw new invalidmonthexception(mm);
}
catch(invalidmonthexception e)
{
}
{
if(mm>=1 && mm<=12)
{
switch(mm)
{
case 1:
case 3:
case 5:
case 7:
case 8:
case 10:
case 12:
try
{
```

```java
if(dd>=1 && dd<=31)
System.out.println("The given Date is Valid");
else
throw new invaliddateexception(dd);
}
catch(invaliddateexception e)
{
}
break;
case 4:
case 6:
case 9:
case 11:
try
{
if(dd>=1 && dd<=30)
System.out.println("The given date valid one");
else
throw new invaliddateexception(dd);
}
catch(invaliddateexception e)
{
}
break;
case 2:
try
{
if(yy%4==0 || yy%100==0)
{
if(dd>=1 && dd<=29)
System.out.println("The date is valid and it is a leap year");
}
else if(dd>=1 && dd<=28)
System.out.println("The given date is valid");
else
throw new invaliddateexception(dd);
}
catch(invaliddateexception e)
{
}
break;
}
}
}
}
```
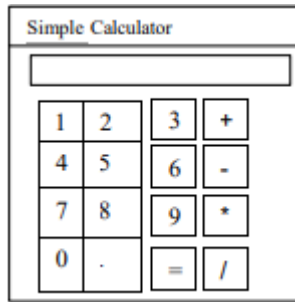
Assignment 5

SET A

1) Write a java program that works as a simple calculator. Use a grid layout to arrange buttons for the digits and for the +, -, *, % operations. Add a text field to display the result.

```
Simple Calculator
 _____
|                   |
 1  2   3   +
 4  5   6   -
 7  8   9   *
 0  .   =   /
```

```java
importjava.awt.*;
importjava.awt.event.*;
importjavax.swing.*;
public class Calculator extendsJFrameimplementsActionListener
{
        JTextFieldtf1;
        JButtonb[]=newJButton[10],bmult,bdiv,badd,bsub,bequal,bdot;
        JPanelp1,p2;
        charopr;
//      int num1,num2;
//      intans=0;
//      booleanint_float_flag=false;
        String num="";
        doublefnum1,fnum2,fans;
        Calculator()
        {
                tf1=newJTextField();
                for(inti=0;i<10;i++)
                {
                        b[i]=newJButton(Integer.toString(i));
                        b[i].addActionListener(this);
                }
                bmult=newJButton("*");
                bdiv=newJButton("/");
                badd=newJButton("+");
                bsub=newJButton("-");
                bequal=newJButton("=");
                bdot=newJButton(".");

                bmult.addActionListener(this);
                bdiv.addActionListener(this);
                badd.addActionListener(this);
                bsub.addActionListener(this);
                bequal.addActionListener(this);
                bdot.addActionListener(this);

                p1=newJPanel();
                p1.setLayout(newGridLayout(1,1));
                p1.add(tf1);

                p2=newJPanel();
                p2.setLayout(newGridLayout(4,4));

                for(inti=1;i<=3;i++)
                        p2.add(b[i]);
                p2.add(badd);
```

```java
            for(int i=4;i<=6;i++)
                    p2.add(b[i]);
            p2.add(bsub);

            for(int i=7;i<=9;i++)
                    p2.add(b[i]);
            p2.add(bmult);

            p2.add(b[0]);
            p2.add(bdot);
            p2.add(bequal);
            p2.add(bdiv);

            setLayout(new BorderLayout());
            add(p1,BorderLayout.NORTH);
            add(p2,BorderLayout.CENTER);

            setTitle("Simple Calculator ");
            setSize(500,400);
            setVisible(true);
            setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);
    }
    public void actionPerformed(ActionEvent ae)
    {
            JButton tb=(JButton)ae.getSource();

            if(tb==b[0])
            {
                    num=num+"0";
                    tf1.setText(num);
    /*          if(tf1.getText()=="0"||tf1.getText()=="0.0")
                            num="";
                    int n=Integer.parseInt(num);
                    tf1.setText(Integer.toString(n));
    */
            }
            if(tb==b[1])
            {
                    num=num+"1";
                    tf1.setText(num);
            }
            if(tb==b[2])
            {
                    num=num+"2";
                    tf1.setText(num);
            }
            if(tb==b[3])
               {
num=num+"3";
tf1.setText(num);
               }
            if(tb==b[4])
               {
num=num+"4";
tf1.setText(num);
               }
            if(tb==b[5])
               {
```

```java
num=num+"5";
tf1.setText(num);
                }
        if(tb==b[6])
            {
num=num+"6";
tf1.setText(num);
                }
        if(tb==b[7])
            {
num=num+"7";
tf1.setText(num);
                }
        if(tb==b[8])
            {
num=num+"8";
tf1.setText(num);
                }
        if(tb==b[9])
            {
num=num+"9";
tf1.setText(num);
                }

        if(tb==badd)
            {
                String tempNum=tf1.getText();
                if(tempNum.contains("."))
                        fnum1=Double.parseDouble(tf1.getText());

                else
                        fnum1=Integer.parseInt(tf1.getText());
                opr='+';
                num="";
            }
        if(tb==bsub)
            {
                String tempNum=tf1.getText();
if(tempNum.contains("."))
fnum1=Double.parseDouble(tf1.getText());

else
fnum1=Integer.parseInt(tf1.getText());
opr='-';
num="";


            }
        if(tb==bmult)
            {
                String tempNum=tf1.getText();
if(tempNum.contains("."))
fnum1=Double.parseDouble(tf1.getText());

else
fnum1=Integer.parseInt(tf1.getText());
opr='*';
num="";


            }
```

```java
                if(tb==bdiv)
                    {
                            String tempNum=tf1.getText();
if(tempNum.contains("."))
fnum1=Double.parseDouble(tf1.getText());

else
fnum1=Integer.parseInt(tf1.getText());
opr='/';
num="";

                    }
                if(tb==bdot)
                {
                        num=num+".";
                        tf1.setText(num);
                }
                if(tb==bequal)
                {
                        String tempNum=tf1.getText();
                        if(tempNum.contains("."))
                                fnum2=Double.parseDouble(tf1.getText());
                        else
                        {
                                fnum2=Integer.parseInt(tf1.getText());
                        }
                        num="";
                        if(opr=='+')
                                fans=fnum1+fnum2;
                        elseif(opr=='-')
                                fans=fnum1-fnum2;
                        elseif(opr=='*')
                                fans=fnum1*fnum2;
                        elseif(opr=='/')
                        {
                                if(fnum2==0)
                                {
                                        tf1.setText("ERROR: Divide By Zero");
                                        return;
                                }
                                else
                                        fans=fnum1/fnum2;
                        }
                        tf1.setText(Double.toString(fans));
                }
        }
    publicstaticvoid main(String args[])
    {
            new Calculator();
    }
}
```

2) Design a screen to handle the Mouse Events such as MOUSE_MOVED and MOUSE_CLICK and display the position of the Mouse_Click in a TextField.

```java
Import java.awt.*;

Import java.awt.event.*;

Import javax.swing.*;

Class MouseEvents extends JFrame implements MouseListener, MouseMotionListener

{

String str="";

JTextArea ta;

Container c;

intx,y;

MouseEvents()

{

        c=getContentPane();

        c.setLayout(new FlowLayout());;


        ta=new JTextArea("Click the mouse or move it", 5,20);

        ta.setFont(new Font("Arial",Font.BOLD,30));

        c.add(ta);

        ta.addMouseListener(this);

        ta.addMouseMotionListener(this);



}

public void mouseClicked(MouseEvent me)

{

        int i=me.getButton();

        if(i==1)
```

```java
                str+="Clicked Button: Left";

        else if(i==2)

                str+="Clicked Button: Middle";

        else if(i==3)

                str+="Clicked Button: Right";

        this.display();


}
public void mouseEntered(MouseEvent me)

{

        str+="Mouse Entered ";

        this.display();

}
public void mouseExited(MouseEvent me)

{

        str+="MouseExited";

        this.display();


}
public void mousePressed(MouseEvent me)

{

        x=me.getX();

        y=me.getY();

        str+="MousePressed at: "+x+"\t"+y;

        this.display();

}
public void mouseReleased(MouseEvent me)
```

```java
{

        x=me.getX();

        y=me.getY();

        str+="Mouse Released at:"+x+"\t"+y;

        this.display();


}
public void mouseDragged(MouseEvent me)

{

        x=me.getX();

        y=me.getY();

        str+="MouseDragged at:"+x+"\t"+y;

        this.display();

}
public void mouseMoved(MouseEvent me)

{

        x=me.getX();

        y=me.getY();

        str+="Mouse Moved at:"+x+"\t"+y;

        this.display();

}
public void display()

{

        ta.setText(str);

        str="";

}

        public static void main(String[] args) {
```

```java
        // TODO Auto-generated method stub

MouseEvents mes=new MouseEvents();

mes.setSize(400,400);

mes.setVisible(true);

mes.setDefaultCloseOperation(JFrame.EXIT_ON_CLOSE);

    }


}
```

Assignment 5

SET B

1) Create the following GUI screen using appropriate layout managers. Accept the name, class , hobbies of the user and apply the changes and display the selected options in a text box.

```
Your Name :   Your Habbies                     Style
              Music                                 Bold
Your Class        Sports      Font              Italic
   o  FY      □ Travelling                  □
              □             Arial  ▼            Underline
   o  SY      □                             □
   o  TY      □             Size   8  ▼      □

              Name :        Class :      Hobbies:
```

importjava.awt.event.*;

importjavax.swing.*;

importjava.awt.*;

public class HobbiesDemo extends JFrame implements ActionListener,ItemListener

{

        JLabel l1,l2,l3,l4,l5;

        JTextField tf1;

        JRadioButton rb1,rb2,rb3;

        ButtonGroupbg;

        JCheckBox cb1,cb2,cb3;

        JPanel p1,p2,p3,p4;

        HobbiesDemo()

        {

                l1=new JLabel("Your Name : ");

                l2=new JLabel("Your Class ");

                l3=new JLabel("Your Hobbies");

                l4=new JLabel("");//used to display name & class

```java
l5=new JLabel("");//used to display hobbies

tf1=new JTextField();

rb1=new JRadioButton("FYBCS");

rb2=new JRadioButton("SYBCS");

rb3=new JRadioButton("TYBCS");

rb1.addActionListener(this);

rb2.addActionListener(this);

rb3.addActionListener(this);

bg=new ButtonGroup();

bg.add(rb1);

bg.add(rb2);

bg.add(rb3);

cb1=new JCheckBox("Music");

cb2=new JCheckBox("Dance");

cb3=new JCheckBox("Sports");

cb1.addItemListener(this);

cb2.addItemListener(this);

cb3.addItemListener(this);

p1=new JPanel();

p1.setLayout(new GridLayout(1,2));

p1.add(l1);        p1.add(tf1);
```

```java
                p2=new JPanel();

p2.setLayout(new GridLayout(4,1));

p2.add(l2);

                p2.add(rb1);

                p2.add(rb2);

                p2.add(rb3);


                p3=new JPanel();

p3.setLayout(new GridLayout(4,1));

p3.add(l3);

                p3.add(cb1);

                p3.add(cb2);

                p3.add(cb3);


                p4=new JPanel();

        p4.setLayout(new GridLayout(1,2));

p4.add(l4);

                p4.add(l5);


                BorderLayout bob=new BorderLayout();

                setLayout(bob);


                add(p1,BorderLayout.NORTH);

                add(p2,BorderLayout.WEST);

                add(p3,BorderLayout.EAST);
```

```java
        add(p4,BorderLayout.SOUTH);


        setTitle("INFORMATION");

        setSize(500,300);

        setVisible(true);

        setDefaultCloseOperation(EXIT_ON_CLOSE);


}

public void actionPerformed(ActionEventae)

{

        String s="NAME : "+tf1.getText()+" CLASS : "+ae.getActionCommand();

        l4.setText(s);

}

public void itemStateChanged(ItemEventie)

{

        String s="";


        if(cb1.isSelected())

                s=s+cb1.getText()+" ";

        if(cb2.isSelected())

                s=s+cb2.getText()+" ";

        if(cb3.isSelected())

                s=s+cb3.getText()+" ";

        l5.setText(" HOBBIES : "+s);

}
```

```java
		public static void main(String args[])

		{

				HobbiesDemo hob=new HobbiesDemo();

		}



}
```

2) Write a Java program to design a screen using Awt that will take a user name and password. If the user name and password are not same, raise an Exception with appropriate message. User can have 3 login chances only. Use clear button to clear the TextFields.

```java
import java.awt.*;
import java.awt.event.*;
class InvalidPasswordException extends Exception
{
```

```java
InvalidPasswordException()
{
System.out.println(" User name and Password is not same");
}
}
public class PasswordDemo extends Frame implements ActionListener
{
Label uname,upass;
TextField nametext;
TextField passtext,msg;
Button login,Clear;
Panel p;
int attempt=0;
char c= ' * ' ;

public void login()
{
p=new Panel();
uname=new Label("Use Name: " ,Label.CENTER);
upass=new Label ("Password: ",Label.RIGHT);

nametext=new TextField(20);
passtext =new TextField(20);
passtext.setEchoChar(c);
msg=new TextField(10);
msg.setEditable(false);

login=new Button("Login");
Clear=new Button("Clear");
login.addActionListener(this);
Clear.addActionListener(this);

p.add(uname);
p.add(nametext);
p.add(upass);
p.add(passtext);
p.add(login);
p.add(Clear);
p.add(msg);
add(p);

setTitle("Login ");
setSize(290,200);
setResizable(false);
```

```java
setVisible(true);
}

public void actionPerformed(ActionEvent ae)
{
Button btn=(Button)(ae.getSource());
if(attempt<3)
{
if((btn.getLabel())=="Clear")
{
nametext.setText("");
passtext.setText("");
}
if((btn.getLabel()).equals("Login"))
{
try
{
String user=nametext.getText();
String upass=passtext.getText();

if(user.compareTo(upass)==0)
{
msg.setText("Valid");
System.out.println("Username is valid");
}
else
{
throw new InvalidPasswordException();
}
}
catch(Exception e)
{
msg.setText("Error");
}
attempt++;
}
}
else
{
System.out.println("you are using 3 attempt");
System.exit(0);
}
}
public static void main(String args[])
{
```

```
PasswordDemo pd=new PasswordDemo();
pd.login();
}
}
```