```
//S Harshini-185001058
/*
1. Write a java program to get ‘n’ elements in an array. Perform the linear and binary search.*/
import java.util.Scanner;
class Search
{
 int linear(int ar[],int n,int k)
{
 for(int i=0;i<n;i++)
 {
          if(ar[i]==k)
                   return i;
 }
return -1;
}
int binary(int a[],int n,int k)
{
 int c=0,b=n,i,l=n;
 while(l!=0)
 {
          i=(b-c)/2;
          if(a[c+i]==k)
                   return c+i;
          else if(a[c+i]<k)
                   c=c+i+1;
          else
                   b=i-1;
          l--;
 }
 return -1;
}
void sorts(int a[],int n)
{
 int t;
          for(int j=0;j<n;j++)
          {
           for(int k=j+1;k<n;k++)
          {
                   if(a[j]>a[k])
                   {
                   t=a[j];
                   a[j]=a[k];
```

```
                    a[k]=t;
                    }
          }
          }
}
}
class Linbin
{
 public static void main(String args[])
{
 Scanner in=new Scanner(System.in);
 int ind=-1;
 Search s=new Search();
 System.out.println("enter the no of elements");
 int n=in.nextInt();
 int []a=new int[n+5];
 int []sort=new int[n];
 System.out.println("enter elements");
 for(int i=0;i<n;i++)
{
 a[i]=in.nextInt();
}
System.out.println("enter search element ");
int k=in.nextInt();
System.out.println("enter 1.linear search 2.binary search ");
int ch=in.nextInt();
if(ch==1)
ind=s.linear(a,n,k);
else
{
 s.sorts(a,n);
 System.out.println("the sorted array is ");
 for(int h=0;h<n;h++)
          System.out.print(a[h]);
 ind=s.binary(a,n,k);
 }
if(ind!=-1)
{
System.out.println("the index position is"+ind);
}
else
System.out.println("element not found");
}
```

```
}

/*
sample output/input
cs1058@u6:~/Desktop/harsh-java$ javac Linbin.java
cs1058@u6:~/Desktop/harsh-java$ java Linbin
enter the no of elements
6
enter elements
1 2 3 4 5 6
enter search element
7
enter 1.linear search 2.binary search
2
the sorted array is
123456element not found
cs1058@u6:~/Desktop/harsh-java$ java Linbin
enter the no of elements
7
enter elements
3 5 6 2 7 9 1
enter search element
5
enter 1.linear search 2.binary search
2
the sorted array is
1235679the index position is3
cs1058@u6:~/Desktop/harsh-java$ java Linbin
enter the no of elements
5
enter elements
1 2 3 4 5
enter search element
3
enter 1.linear search 2.binary search
1
the index position is2
*/


/*2. Write a java program to find matrix addition, subtraction and multiplication.
*/import java.util.Scanner;
class Perform
```

```
{
void add(int a[][],int b[][],int row,int col)
{
 int c[][]=new int[row][col];
 for(int i=0;i<row;i++)
  for(int j=0;j<col;j++)
   c[i][j]=a[i][j]+b[i][j];
 System.out.println("the sum matrix is\n");
 for(int i=0;i<row;i++)
  {
  for(int j=0;j<col;j++)
   System.out.print(c[i][j]+" ");
  System.out.print("\n");
  }
 return;
}
void subtract(int a[][],int b[][],int row,int col)
{
 int c[][]=new int[row][col];
 for(int i=0;i<row;i++)
  for(int j=0;j<col;j++)
   c[i][j]=a[i][j]-b[i][j];
 System.out.println("the difference matrix is\n");
 for(int i=0;i<row;i++)
  {
  for(int j=0;j<col;j++)
   System.out.print(c[i][j]+" ");
  System.out.print("\n");
  }
 return;
}
void multiply(int a[][],int b[][],int row1,int col1,int col2)
{
 int c[][]=new int[row1][col2];
 for(int i=0;i<row1;i++)
  for(int j=0;j<col2;j++)
   c[i][j]=0;
 for(int i=0;i<row1;i++)
  for(int j=0;j<col2;j++)
   for(int k=0;k<col1;k++)
    c[i][j]=c[i][j]+(a[i][k]*b[k][j]);
 System.out.println("the product matrix is\n");
 for(int i=0;i<row1;i++)
```

```
  {
  for(int j=0;j<col2;j++)
   System.out.print(c[i][j]+" ");
  System.out.print("\n");
  }
 return;
}
}
class Matrix
{
 public static void main(String arg[])
 {
 Scanner in=new Scanner(System.in);
 int ch=10;
 Perform p=new Perform();
 while(ch!=0)
 {
 System.out.println("enter choice to perform 1.Matrix addition 2.Matrix subtraction 3.Matrix
multiplication 4. enter 0 to exit");
 ch=in.nextInt();
 if((ch==1)||(ch==2))
 {
  System.out.println("enter no of rows in matrix");
  int row=in.nextInt();
  System.out.println("enter no of columns in matrix");
  int col=in.nextInt();
  System.out.println("enter elements of first matrix");
  int a[][]=new int[row][col];
  for(int i=0;i<row;i++)
  {
   for(int j=0;j<col;j++)
   {
    a[i][j]=in.nextInt();
   }
  }
  System.out.println("enter elements of second matrix");
  int b[][]=new int[row][col];
  for(int i=0;i<row;i++)
  {
   for(int j=0;j<col;j++)
   {
    b[i][j]=in.nextInt();
   }
```

```
 }

 if(ch==1)
  p.add(a,b,row,col);
 else
  p.subtract(a,b,row,col);
 }
 if(ch==3)
  {
  System.out.println("the column of 1st matrix and row of 2nd matrix should be equal");
  System.out.println("enter no of rows in matrix 1");
  int row1=in.nextInt();
  System.out.println("enter no of columns in matrix 1");
  int col1=in.nextInt();
  System.out.println("enter no of rows in matrix 2");
  int row2=in.nextInt();
  System.out.println("enter no of columns in matrix 2");
  int col2=in.nextInt();
  System.out.println("enter elements of first matrix");
  int a[][]=new int[row1][col1];
  for(int i=0;i<row1;i++)
  {
   for(int j=0;j<col1;j++)
   {
    a[i][j]=in.nextInt();
   }
  }
  System.out.println("enter elements of second matrix");
  int b[][]=new int[row2][col2];
  for(int i=0;i<row2;i++)
  {
   for(int j=0;j<col2;j++)
   {
    b[i][j]=in.nextInt();
   }
  }
  p.multiply(a,b,row1,col1,col2);
  }
 }
}
}

/*sample input/output
```

```
cs1058@u6:~/Desktop/harsh-java$ javac Matrix.java
cs1058@u6:~/Desktop/harsh-java$ javaMatrix
javaMatrix: command not found
cs1058@u6:~/Desktop/harsh-java$ java Matrix
enter choice to perform 1.Matrix addition 2.Matrix subtraction 3.Matrix multiplication 4. enter 0 to exit
1
enter no of rows in matrix
2
enter no of columns in matrix
2
enter elements of first matrix
1 1
1 1
enter elements of second matrix
2 2
2 2
the sum matrix is

3 3
3 3
enter choice to perform 1.Matrix addition 2.Matrix subtraction 3.Matrix multiplication 4. enter 0 to exit
2
enter no of rows in matrix
3
enter no of columns in matrix
3
enter elements of first matrix
3 3 3
3 3 3
3 3 3
enter elements of second matrix
1 1 1
1 1 1
1 1 4
the difference matrix is

2 2 2
2 2 2
2 2 -1
enter choice to perform 1.Matrix addition 2.Matrix subtraction 3.Matrix multiplication 4. enter 0 to exit
```

```
3
the column of 1st matrix and row of 2nd matrix should be equal
enter no of rows in matrix 1
2
enter no of columns in matrix 1
3
enter no of rows in matrix 2
3
enter no of columns in matrix 2
2
enter elements of first matrix
1 2
1 2
1 2
enter elements of second matrix
1 1 1
1 1 1
the product matrix is

4 4
5 5
enter choice to perform 1.Matrix addition 2.Matrix subtraction 3.Matrix multiplication 4. enter 0 to
exit
4
enter choice to perform 1.Matrix addition 2.Matrix subtraction 3.Matrix multiplication 4. enter 0 to
exit
0
*/


/*3. Develop a Java application to generate Electricity bill.
*/
import java.util.Scanner;
class Calc
{
 Scanner in=new Scanner(System.in);
 void assign()
{
 System.out.println("enter consumer name, number,previous reading,current reading,type of eb
as domestic(1) or commercial(2)");

 String name=in.nextLine();
int n=in.nextInt();
```

```
 double prev=in.nextDouble();
 double curr=in.nextDouble();
 int type=in.nextInt();
 if(type==1)
  calcdom(curr);
else
calccom(curr);
}
void calcdom(double prev)
{
 double s;
 if(prev<=100)
 s=prev*1;
 else if(prev<=200)
 s=(prev-100)*2.5+100;
 else if(prev<=500)
 s=(prev-200)*4+(2.5*100)+100;
 else
 s=(prev-500)*6+(300*4)+(2.5*100)+100;
 System.out.println("the cost is"+s);
}
void calccom(double prev)
{
 double sd;
 if(prev<=100)
 sd=prev*2;
 else if(prev<=200)
 sd=(prev-100)*4.5+200;
 else if(prev<=500)
 sd=(prev-200)*6+(4.5*100)+200;
 else
 sd=(prev-500)*7+(300*6)+(4.5*100)+200;
 System.out.println("the cost is"+sd);
}}
class Eb{
public static void main(String arg[])
{
 Calc c=new Calc();
 c.assign();
}}
/*sample input/output
cs1058@u6:~/Desktop/harsh-java$ javac Eb.java
cs1058@u6:~/Desktop/harsh-java$ java Eb
```

```
enter consumer name, number,previous reading,current reading,type of eb as domestic(1) or
commercial(2)
harshini
45
300
500
1
the cost is1550.0
cs1058@u6:~/Desktop/harsh-java$ java Eb
enter consumer name, number,previous reading,current reading,type of eb as domestic(1) or
commercial(2)
harshu
67
200
700
2
the cost is3850.0
*/



/*4. Write a java program to create a class named ‘Student’ with name, id, dept, 3 marks as data
members. Write function to assign the inputs,
calculate grade, display and search. Perform these operations for ‘n’ number of students.
[Search using id and dept – use method overloading]
*/
import java.util.Scanner;
import java.lang.*;
class Compute
{
        private String name,dept,g;
        private int id=0;
        private int []marks=new int[3];
        void assign()
        {
                System.out.println("enter details of student 1.name 2.department 3.id 4.marks");
                Scanner in=new Scanner(System.in);
                name=in.nextLine();
                dept=in.nextLine();
                id=in.nextInt();
                for(int i=0;i<3;i++)
                {
                        marks[i]=in.nextInt();
```

```
        }
        return;
}
void grade()
{
        int avg,s=0;
        for(int i=0;i<3;i++)
                s=s+marks[i];
        avg=s/3;
        System.out.println("Average:"+avg);
        if(avg>90)
                g="o";
        else if(avg>80)
                g="a+";
                //System.out.println("grade is a+");
        else if(avg>70)
                g="a";
        else if(avg>60)
                g="b+";
        else if(avg>50)
                g="b";
        else
                g="c";
        return;
}
int search(int n)
{
        if(n==id)
                return 1;
        else
                return -1;
}
int search(String d)
{
        if(dept.compareTo(d)==0)
                return 1;
        else
                return -1;
}
void display()
{
        System.out.println("name:"+name);
        System.out.println("department"+dept);
```

```
                System.out.println("ID:"+id);
                System.out.println("the marks in 3 subjects are ");
                for(int j=0;j<3;j++)
                        System.out.print(marks[j]+" ");
                System.out.println("");
                System.out.println(g);
        }

}
 class Students
 {
         public static void main(String argv[])
         {
                 int ch,n,t=-1,a=1;
                 Scanner in=new Scanner(System.in);
                 System.out.println("enter no of students whose data is to be managed");
                 n=in.nextInt();
                 Compute[] c=new Compute[n];
                 for(int i=0;i<n;i++)
                 {
                         c[i]=new Compute();
                         c[i].assign();
                         c[i].grade();
                 }
                 while(a==1)
                {
                        System.out.println("enter choice 1.search by department 2.search by id
3.display 4.exit(enter 0)");
                        ch=in.nextInt();
                        switch(ch)
                        {
                        case 1:System.out.println("enter dept to search");
                                //int t;
                              String temp=in.nextLine();
                                String d=in.nextLine();
                                for(int i=0;i<n;i++)
                                {
                                        t=c[i].search(d);
                                        if(t==1)
                                        {
                                                System.out.println("the student is present");
                                                i=n;
                                        }
```

```
                                        }
                                        if(t==-1)
                                                System.out.println("the student is absent");
                                        break;

                                case 2:System.out.println("enter id no to search a student");
                                        int id1=in.nextInt();
                                        //int t;
                                        for(int i=0;i<n;i++)
                                        {
                                                t=c[i].search(id1);
                                                if(t==1)
                                                {
                                                        System.out.println("the student is present");
                                                        i=n;
                                                }
                                        }
                                        if(t==-1)
                                                System.out.println("the student is absent");
                                        break;
                                case 3:System.out.println("enter a no to print the particular student
record");
                                        int r=in.nextInt();
                                        c[r].display();
                                        break;
                                case 4:a=0;
                                        break;
                                }
                        }


                }
        }
```

```
 /*sample input/output
 C:\Users\Harshini\javaprog>javac Students.java

C:\Users\Harshini\javaprog>java Students
enter no of students whose data is to be managed
3
enter details of student 1.name 2.department 3.id 4.marks
Harshini
cse
```

```
1
88 88 88
Average:88
enter details of student 1.name 2.department 3.id 4.marks
Dharu
bme
11
99 99 99
Average:99
enter details of student 1.name 2.department 3.id 4.marks
Yami
civil
21
100 99 100
Average:99
enter choice 1.search by department 2.search by id 3.display 4.exit(enter 0)
1
enter dept to search
bme
the student is present
enter choice 1.search by department 2.search by id 3.display 4.exit(enter 0)
1
enter dept to search
it
the student is absent
enter choice 1.search by department 2.search by id 3.display 4.exit(enter 0)
2
enter id no to search a student
1
the student is present
enter choice 1.search by department 2.search by id 3.display 4.exit(enter 0)
3
enter a no to print the particular student record
0
name:Harshini
departmentcse
ID:1
the marks in 3 subjects are
88 88 88
a+
enter choice 1.search by department 2.search by id 3.display 4.exit(enter 0)
4
*/
```

```
/*5. Write a java program to create a class named ‘Employee’ with name, id, designation,
years-of-experience,
 basicpay, DA, HRA, LIC, PF and no. of hours worked.
 Write functions to calculate the gross pay and net pay.
*/


import java.util.Scanner;
import java.lang.*;
class Employee
{
	private String name,des;
	int id,yoe,noh;
	double bp,hra,da,lic,pf,hwage,ded,gs,ns;
	void input()
	{
		Scanner in=new Scanner(System.in);
		System.out.println("enter details of an employee 1.name 2.designation 3.id
4.years of experience 5. basicpay/wage per hour 6.LIC 7.no of hours worked ");
		name=in.nextLine();
		des=in.nextLine();
		id=in.nextInt();
		yoe=in.nextInt();
		bp=in.nextDouble();
		lic=in.nextDouble();
		noh=in.nextInt();
	}
	void gross()
	{	if(des.compareTo("intern")==0)
		{
			gs=noh*bp+2000+1000;
			ded=lic+500;
			ns=gs-ded;
		}
		else if(des.compareTo("manager")==0)
		{
			gs=bp+0.4*bp+0.1*bp;
			ded=lic+0.08*bp;
			ns=gs-ded;
		}
		else
```

```
		{
			gs=bp+0.3*bp+0.1*bp;
			ded=lic+0.08*bp;
			ns=gs-bp;
		}
	}
	void promote()
	{
		if(des.compareTo("intern")==0 && yoe>2)
			des="trainee";
		else if(des.compareTo("trainee")==0 && yoe>2)
			des="analyst";
		else if(des.compareTo("analyst")==0 && yoe>2)
			des="softwareEngineer";
		else if(des.compareTo("softwareEngineer")==0 && yoe>2)
			des="teamlead";
		else
			des="manager";
	}

	void output()
	{
		System.out.println("\n");
		System.out.println("name:"+name+"\ndesignation:"+des+"\nGross
salary:"+gs+"\nnet salary:"+ns);
	}
}
class Empcalc
{
	public static void main(String argv[])
	{
		int a=1;
		Scanner in=new Scanner(System.in);
		System.out.println("enter no of employees");
		int n=in.nextInt();
		Employee[] e=new Employee[n];
		for(int i=0;i<n;i++)
		{
			e[i]=new Employee();
			e[i].input();
			e[i].gross();
			e[i].promote();
		}
```

```
                System.out.println("details of all employees");
                for(int j=0;j<n;j++)
                {
                        e[j].promote();
                        e[j].output();
                }
                while(a==1)
                {
                        System.out.println("enter 1 if you want to print a payslip else enter 0");
                        a=in.nextInt();
                        if(a==1)
                        {
                                System.out.println("enter a no to print a particular payslip");
                                int p=in.nextInt();
                                e[p].output();
                        }
                        else
                                break;
                }
        }
}

/*sample input/output
C:\Users\Harshini\javaprog>javac Empcalc.java

C:\Users\Harshini\javaprog>java Empcalc
enter no of employees
3
enter details of an employee 1.name 2.designation 3.id 4.years of experience 5. basicpay/wage per hour 6.LIC 7.no of hours worked
harshini
manager
1
2
70000
5000
7
enter details of an employee 1.name 2.designation 3.id 4.years of experience 5. basicpay/wage per hour 6.LIC 7.no of hours worked
yami
trainee
2
1
```

30000
3000
9
enter details of an employee 1.name 2.designation 3.id 4.years of experience 5. basicpay/wage per hour 6.LIC 7.no of hours worked
varuni
analyst
3
3
50000
4000
9
details of all employees

name:harshini
designation:manager
Gross salary:105000.0
net salary:94400.0

name:yami
designation:manager
Gross salary:42000.0
net salary:12000.0

name:varuni
designation:teamlead
Gross salary:70000.0
net salary:20000.0
enter 1 if you want to print a payslip else enter 0
1
enter a no to print a particular payslip
1

name:yami
designation:manager
Gross salary:42000.0
net salary:12000.0
enter 1 if you want to print a payslip else enter 0
1

enter a no to print a particular payslip
0

name:harshini
designation:manager
Gross salary:105000.0
net salary:94400.0
enter 1 if you want to print a payslip else enter 0
0
*/