```
//JAVA LAB EXCERCISE 2

/*
	Program to implement the number guess game
*/

import java.lang.Math;
import java.util.Scanner;

public class NumberGuess
{
	public static void main(String args[])
	{
		Scanner input = new Scanner(System.in);

		double key = Math.floor(Math.random()*100);
		int count = 0;
		do
		{
			System.out.print("Enter your guess: ");
			int number = input.nextInt();
			if(number==key)
			{
				System.out.println("\nCongratulations you guessed the number in
"+count+" tries");
				break;
			}
			else if(number<key)
			{
				System.out.println("\nYou guessed too low!");
				count++;
			}
			else if(number>key)
			{
				System.out.println("\nYou guessed too high!");
				count++;
			}
		}while(true);
	}
}

/*Output:
cs1200@wtl17:~/Desktop/Java/Ex2$ javac NumberGuess.java
```

```
cs1200@wtl17:~/Desktop/Java/Ex2$ java NumberGuess
Enter your guess: 50

You guessed too high!
Enter your guess: 35

You guessed too high!
Enter your guess: 25

You guessed too high!
Enter your guess: 15

You guessed too low!
Enter your guess: 20

You guessed too high!
Enter your guess: 19

You guessed too high!
Enter your guess: 18

Congratulations you guessed the number in 6 tries
*/
```

```
/*
        Program to generate electricity bill
*/

import java.util.Scanner;
public class ElectricityBill{
        double  Consumerno;
        String  Consumername;
        String  type;
        double Previousmonth;
        double Currentmonth;
        public double total;

        public void input()
        {
```

```
        Scanner inp = new Scanner(System.in);
        System.out.print("\nEnter Consumer name: ");
        Consumername = inp.nextLine();
        System.out.print("\nEnter Connection type: ");
        type = inp.nextLine();
        System.out.print("\nEnter Consumer number: ");
        Consumerno = inp.nextDouble();
        System.out.print("\nEnter Previous month readings: ");

        Previousmonth = inp.nextDouble();
        System.out.print("\nEnter Current month readings: ");
        Currentmonth = inp.nextDouble();
}s

public void calc()
{
        if(type.equals("commercial"))
        {
                System.out.print("\nCommercial type calculation is used");
                if(Currentmonth>500)
                        total = 2000 + 450 + ((Currentmonth-500)*7);
                else if(Currentmonth>200)
                        total = 200 + 450 + ((Currentmonth-200)*6);
                else if(Currentmonth>100)
                        total = 200 + ((Currentmonth-100)*4.5);
                else
                        total = 2*Currentmonth;
        }
        else
        {
                System.out.print("\nDomestic type calculation is used");
                if(Currentmonth>500)
                        total = 100 + 250 + 1200 + ((Currentmonth-500)*6);
                else if(Currentmonth>200)
                        total = 100 + 250 + ((Currentmonth-200)*4);
                else if(Currentmonth>100)
                        total = 100 + ((Currentmonth-100)*2.5);
                else
                        total = Currentmonth;
        }
}
public static void main(String args[]){
```

```
                ElectricityBill a = new ElectricityBill();
                a.input();
                a.calc();
                System.out.println("The total is calculated to be: "+a.total);

        }
}
/*Output
cs1200@wtl17:~/Desktop/Java/Ex2$ java ElectricityBill

Enter Consumer name: Vish

Enter Connection type: Domestic

Enter Consumer number: 5

Enter Previous month readings: 350

Enter Current month readings: 300

Domestic type calculation is used

The total is calculated to be: 750.0
cs1200@wtl17:~/Desktop/Java/Ex2$ java ElectricityBill

Enter Consumer name: Vishnu

Enter Connection type: commercial

Enter Consumer number: 6

Enter Previous month readings: 900

Enter Current month readings: 450

Commercial type calculation is used

The total is calculated to be: 2150.0
*/

--------------------------------------------------------------------------------
```

```
/* Create a class named ‘Employee’ with id, name, designation, date-of-birth, date-of-join, basic,
DA, HRA, LIC, PF and no. of hours worked. Calculate the Gross salary and net salary
import java.util.Scanner;
*/
Import java.util.scanner;

public class Employee{
	double id,basic,DA,HRA,LIC,PF,n;
	String designation,name;
	int dobd,dobm,doby;
	int dojd,dojm,dojy;
	double gross,net,deductions,hourlywage;

	public void input()
	{
		Scanner inp=new Scanner(System.in);
		System.out.print("\nEnter Employee name: ");
		name = inp.nextLine();
		System.out.print("\nEnter Employee designation: ");
		designation = inp.nextLine();
		System.out.print("\nEnter Employee ID: ");
		id = inp.nextDouble();
		System.out.print("\nEnter no of hours worked");
		n = inp.nextDouble();
		System.out.print("\nEnter date of birth");
		dobd = inp.nextInt();
		dobm = inp.nextInt();
		doby = inp.nextInt();
		System.out.print("\nEnter date of join");
		dojd = inp.nextInt();
		dojm = inp.nextInt();
		dojy = inp.nextInt();
		System.out.print("\nHas the employee opted for LIC premium insurance?(Enter
amount per month to be deducted if yes;Enter zero if no");
		LIC  = inp.nextDouble();
		System.out.print("\nEnter Basic Pay");
		basic = inp.nextDouble();
		System.out.print("\nEnter hourly wage");
		hourlywage = inp.nextDouble();
	}
```

```
public void calc()
{
	if(designation.equals("Intern"))
	{

		DA = 2000;
		HRA = 1000;
		PF = 500;
		gross = (n*hourlywage)+DA+HRA;
		deductions = LIC + PF;
		net = gross - deductions;
	}
	else if(designation.equals("Manager"))
	{

		DA = 0.4*basic;
		HRA = 0.1*basic;
		PF = 0.08*basic;
		gross = basic+DA+HRA;
		deductions = LIC + PF;
		net = gross - deductions;

	}
	else
	{
		DA = 0.3*basic;
		HRA = 0.1*basic;
		PF = 0.08*basic;
		gross = basic+DA+HRA;
		deductions = LIC + PF;
		net = gross - deductions;

	}
}
public void disp()
{
	System.out.println("\n\nEmployee name: "+name );
	System.out.println("\nDesignation: "+designation );
	System.out.println("\nGross pay= "+gross );
	System.out.println("\nDeductions = "+deductions );
	System.out.println("\nNet Pay= "+net);
	System.out.println();
```

```
	}
	public static void main(String args[]){
		Scanner inp = new Scanner(System.in);
		System.out.print("Enter no of employees to be added: ");
		int no;
		no =  inp.nextInt();
		Employee a[] = new Employee[no];
		for(int i=0;i<no;i++)
		{
			a[i] = new Employee();
			a[i].input();
			if(a[i].dojy<2015)
				a[i].designation = "Manager";
			a[i].calc();
			a[i].disp();
		}
	}
}

/*output:
cs1200@wtl17:~/Desktop/Java/Ex2$ java Employee
Enter no of employees to be added: 1

Enter Employee name: Vishnu

Enter Employee designation: Manager

Enter Employee ID: 20

Enter no of hours worked90

Enter date of birth 09 05 2001

Enter date of join 09 07 2018

Has the employee opted for LIC premium insurance?(Enter amount per month to be deducted if yes;Enter zero if no 0

Enter Basic Pay2000

Enter hourly wage700
```

Employee name: Vishnu

Designation: Manager

Gross pay= 3000.0

Deductions = 160.0

Net Pay= 2840.0
*/

/*4. Consider the following members for a ‘Student’ with regno, name, dept, 3 marks.
• Calculate the total and grade for the given student number. [apply encapsulation]
• Search the student using id, department. [use method overloading]
• Perform these operations for ‘n’ number of students.*/s

```
import java.util.Scanner;
public class Student
{
	static int n;
	int regno;
	String name,dept;
	float m1,m2,m3,tot,avg;
	char grade;

	public void calcTotal()
	{
		tot=m1+m2+m3;
		avg=tot/3;
	}

	public void calcGrade()
	{
		if(avg>=90)
			grade='O';
		else if(avg>=80 && avg<90)
			grade='A';
		else if(avg>=70 && avg<80)
			grade='B';
		else if(avg>=60 && avg<70)
			grade='C';
```

```
		else
			grade='F';
	}

	public void input()
	{
		System.out.println("Enter Student Details: ");
		Scanner sc=new Scanner(System.in);
		System.out.println("Enter Student ID: ");
		regno=sc.nextInt();
		System.out.println("Enter Student Name: ");
		sc.nextLine();
		name=sc.nextLine();
		System.out.println("Enter Student Department: ");
		dept=sc.nextLine();
		System.out.println("Enter Student Marks (Separated by spaces): ");
		m1=sc.nextInt();
		m2=sc.nextInt();
		m3=sc.nextInt();
	}

	public static void main(String args[])
	{
		Scanner sn=new Scanner(System.in);
		System.out.println("Enter the number of students: ");
		int n=sn.nextInt();
		Student s[]=new Student[n+1];
		for(int i=0;i<n;i++){
			s[i]=new Student();
			s[i].input();
			s[i].calcTotal();
			s[i].calcGrade();

		}

		while(true){
			int flag=0;
			System.out.println("\nDo you wish to search for a particular
student?(Y-1,N-0)");
			int ch=sn.nextInt();
			if(ch==1){
				System.out.println("Enter 1 to search by department\nEnter 2 to
search by ID");
```

```
                        int opt=sn.nextInt();
                        if(opt==2){
                                System.out.println("Enter Student ID: ");
                                int id=sn.nextInt();
                                for(int i=0;i<n;i++){
                                        if(id==s[i].regno){
                                                System.out.println("\n\nStudent name:
"+s[i].name+"\nStudent Total: "+s[i].tot+"\nStudent Grade: "+s[i].grade);
                                                flag++;
                                        }
                                }
                                if(flag==0)
                                        System.out.println("Sorry, the specified student ID
does not exist.");
                        }
                        else if(opt==1){
                                System.out.println("Enter Student Department: ");
                                sn.nextLine();
                                String studept=sn.nextLine();
                                System.out.println("Enter Student Name: ");
                                String stuname=sn.nextLine();
                                for(int i=0;i<n;i++){
                if(studept.equalsIgnoreCase(s[i].dept)&&stuname.equalsIgnoreCase(s[i].name)){
                                                System.out.println("\n\nStudent ID:
"+s[i].regno+"\nStudent Total: "+s[i].tot+"\nStudent Grade: "+s[i].grade);
                                                flag++;
                                        }
                                }
                                if(flag==0)
                                        System.out.println("Sorry, the specified student in
the specified department does not exist.");
                        }
                        else
                                System.out.println("Invalid Input! Enter 1 or 2 only!");
                }
                else if(ch==0){
                        System.out.println("\n\nThank you!");
                        System.exit(0);
                        break;
                }
                else
                        System.out.println("Invalid Input! Enter 0 or 1 only.");
        }
```

```
	}
}
```

```
//1. Write a program to sort an array.
import java.util.Scanner;
class Sort
{
	public static void main(String args[])
	{
		Scanner obj = new Scanner(System.in);
		System.out.print("Enter number of elements: ");
		int a[] = new int[20];
		int n = obj.nextInt();
		int i;
		for(i = 0;i<n;i++)
		{
			System.out.print("Enter element ");
			a[i] = obj.nextInt();
		}
		System.out.println("After sorting");
		for(i = 0;i<n-1;i++)
		{
			for( int j = 0;j<n-i-1;j++)
			{
				if(a[j]>a[j+1])
				{
					int c = a[j];
					a[j] = a[j+1];
					a[j+1] = c;
				}
			}
		}
		for(i = 0;i<n;i++)
		{
			System.out.print(a[i]+" ");
		}

	}
}
/*OUTPUT
vishnu@vishnu-G7-7588:~/Desktop/JAVA$ javac Sort.java
vishnu@vishnu-G7-7588:~/Desktop/JAVA$ java Sort
Enter number of elements: 10
```

```
Enter element 5
Enter element 7
Enter element 4
Enter element 7
Enter element 10
Enter element 5
Enter element 9
Enter element 3
Enter element 6
Enter element 3
After sorting
3 3 4 5 5 6 7 7 9 10
*/
```

```
//2. Write a program to perform linear and binary search on an array for the required element.
import java.util.Scanner;
import java.util.Arrays;
class Search
{
	public static void main(String args[])
	{
		Scanner obj = new Scanner(System.in);
		System.out.print("Enter number of elements: ");
		int a[] = new int[20];
		int n = obj.nextInt();
		int i,j;
		for(i = 0;i<n;i++)
		{
			System.out.print("Enter element ");
			a[i] = obj.nextInt();
		}
		System.out.print("Enter  element to be searched via Linear search: ");
		j = obj.nextInt();
		int flag = 0;
		for(i = 0;(i < n)&&(flag==0);i++)
		{
			if(a[i] == j)
			{
				flag = 1;
				System.out.println("Element found at "+(i+1)+" position using
Linear Search");
			}
		}
```

```
                if(flag ==0)
                System.out.print("Element not found ");
                System.out.print("Enter element to be searched via Binary search: ");
                j = obj.nextInt();
                Arrays.sort(a);
                int key = j;
        int res = Arrays.binarySearch(a, key);
        if (res >= 0)
                        System.out.println(key + " found  Using binary search");
                else
                        System.out.println(key + " Not found");

        }
}
/*OUTPUT
vishnu@vishnu-G7-7588:~/Desktop/JAVA$ javac Search.java
vishnu@vishnu-G7-7588:~/Desktop/JAVA$ java Search
Enter number of elements: 5
Enter element 5
Enter element 4
Enter element 8
Enter element 6
Enter element 10
Enter  element to be searched via Linear search: 4
Element found at 2 position using Linear Search
Enter element to be searched via Binary search: 6
6 found Using binary search
*/
```

```
//3.Matrix Addition,Multiplication and Subtraction
import java.util.Scanner;
class matrix
{
        public static void input(int a[][],int m,int n)
        {
                Scanner s = new Scanner(System.in);
                for(int i=0;i<m;i++)
                {
                        for(int j = 0;j<n;j++)
                        {
                                System.out.print("Enter element: ");
                                a[i][j] = s.nextInt();
```

```
                }
        }
}
static void ADD(int a[][],int b[][],int m,int n)
{
        int c[][] = new int[5][5];
        for(int i=0;i<m;i++)
        {
                for(int j = 0;j<n;j++)
                {
                        c[i][j] = a[i][j]+b[i][j];
                }
        }
        System.out.println("\nAfter Addition:");
        disp(c,m,n);
}

static void SUB(int a[][],int b[][],int m,int n)
{
        int c[][] = new int[5][5];
        for(int i=0;i<m;i++)
        {
                for(int j = 0;j<n;j++)
                {
                        c[i][j] = a[i][j]-b[i][j];
                }
        }
        System.out.println("\nAfter Subtraction:");
        disp(c,m,n);
}

static void MULT(int a[][],int b[][],int row1,int col1,int col2)
{
        int c[][] = new int[5][5];
        for(int i=0;i<row1;i++)
        {
                for(int j = 0;j<col2;j++)
                {
                        c[i][j] = 0;
                        for(int k = 0;k<col1;k++)
                                c[i][j]+=a[i][k]*b[k][j];
                }
        }
```

```
            System.out.println("\nAfter Multiplication:");
            disp(c,row1,col2);
        }

        static void disp(int a[][], int m,int n)
        {
            for(int i=0;i<m;i++)
            {
                for(int j=0;j<n;j++)
                    System.out.print(a[i][j]+" ");
                System.out.println();
            }
        }



        public static void main(String args[])
        {
            Scanner obj = new Scanner(System.in);
            int row1,col1,row2,col2,c;
            int a[][] = new int[5][5];
            int b[][] = new int[5][5];
            System.out.print("Enter number of rows of matix1: ");
            row1 = obj.nextInt();
            System.out.print("Enter number of columns of matrix1: ");
            col1 = obj.nextInt();

            System.out.print("Enter number of rows of matrix2: ");
            row2 = obj.nextInt();
            System.out.print("Enter number of columns of matrix2: ");
            col2 = obj.nextInt();
            do
            {

System.out.print("\n\tMenu\n1.ADD\n2.SUBTRACT\n3.MULTIPLY\n4.EXIT\nEnter your choice:
");
                    c = obj.nextInt();
                    switch(c)
                    {
                        case 1:if((row1==row2)&&(col1==col2))
                                {
                                    System.out.println("Enter elements of 1st matrix");
                                    input(a,row1,col1);
```

```
                                        System.out.println("Enter elements of 2nd matrix");
                                        input(b,row2,col2);
                                        ADD(a,b,row1,col1);
                                }
                                else
                                        System.out.println("Addition cannot be done with
these matrices");
                                break;
                        case 2:if((row1==row2)&&(col1==col2))
                                {
                                        System.out.println("Enter elements of 1st matrix");
                                        input(a,row1,col1);
                                        System.out.println("Enter elements of 2nd matrix");
                                        input(b,row2,col2);
                                        SUB(a,b,row1,col1);
                                }
                                else
                                        System.out.println("Subtraction cannot be done
with these matrices");
                                break;
                        case 3:if(col1 == row2)
                                {
                                        System.out.println("Enter elements of 1st matrix");
                                        input(a,row1,col1);
                                        System.out.println("Enter elements of 2nd matrix");
                                        input(b,row2,col2);
                                        MULT(a,b,row1,col1,col2);
                                }
                                else
                                        System.out.println("Multiplication cannot be done
with these matrices");
                                break;
                        case 4: System.exit(0);
                        default: System.out.println("Invalid input!:");
                        }
                }while(true);
        }
}
/*OUTPUT
cs1200@wtl17:~/Desktop/Java/EX2B$ javac matrix.java
cs1200@wtl17:~/Desktop/Java/EX2B$ java matrix
Enter number of rows of matix1: 2
Enter number of columns of matrix1: 2
```

```
Enter number of rows of matrix2: 2
Enter number of columns of matrix2: 2

        Menu
1.ADD
2.SUBTRACT
3.MULTIPLY
4.EXIT
Enter your choice: 1
Enter elements of 1st matrix
Enter element: 4
Enter element: 5
Enter element: 6
Enter element: 7
Enter elements of 2nd matrix
Enter element: 4
Enter element: 5
Enter element: 6
Enter element: 7

After Addition:
8 10
12 14

        Menu
1.ADD
2.SUBTRACT
3.MULTIPLY
4.EXIT
Enter your choice: 2
Enter elements of 1st matrix
Enter element: 4
Enter element: 6
Enter element: 7
Enter element: 8
Enter elements of 2nd matrix
Enter element: 1
Enter element: 2
Enter element: 3
Enter element: 4

After Subtraction:
3 4
```

```
4 4

        Menu
1.ADD
2.SUBTRACT
3.MULTIPLY
4.EXIT
Enter your choice: 3
Enter elements of 1st matrix
Enter element: 1
Enter element: 2
Enter element: 1
Enter element: 4
Enter elements of 2nd matrix
Enter element: 0
Enter element: 0
Enter element: 0
Enter element: 1

After Multiplication:
0 2
0 4

        Menu
1.ADD
2.SUBTRACT
3.MULTIPLY
4.EXIT
Enter your choice: 4
*/
```

```
//4. Write a program to Find the Number of Non-Repeated Elements in an Array.
import java.util.Scanner;
class Repeat
{
        public static void main(String args[])
        {
                int arr[] = new int[20];
                Scanner obj = new Scanner(System.in);
                System.out.print("Enter number of elements: ");
```

```
                int n = obj.nextInt();
                for(int i=0;i<n;i++)
                {
                        System.out.print("Enter element: ");
                        arr[i] = obj.nextInt();
                }
                int c[] = new int[20];
                int temp=0,flag;
                c[temp] = arr[0];
                temp++;
                for(int i=1;i<n;i++)
                {
                        flag = 0;
                        for(int j=0;j<temp;j++)
                        {
                                if(arr[i]==c[j])
                                        flag = 1;
                        }
                        if(flag == 0)
                        {
                                c[temp] = arr[i];
                                temp++;
                        }
                }

                System.out.println("\nNumber of unique elements is: "+temp);
        }
}
/*OUTPUT:
cs1200@wtl17:~/Desktop/Java/EX2B$ javac Repeat.java
cs1200@wtl17:~/Desktop/Java/EX2B$ java Repeat
Enter number of elements: 5
Enter element: 3
Enter element: 4
Enter element: 6
Enter element: 6
Enter element: 5
Number of unique elements is: 4
*/
```