PROGRAM 1

Define a class 'product' with data members pcode, pname and price.

Create 3 objects of the class and find the product having the lowest price.

CODE:

```java
public class product

{

int pcode;

String pname;

double price;

double lowest;

void data(int c, String n, double p){

pcode=c;

pname=n;

price=p;

}

void display(){

System.out.println(pcode+"\t\t"+pname+"\t\t"+price);

}

static void findLowest(double price1,double price2, double price3){

if(price1<=price2 && price1<=price3){

System.out.println("\nProduct 1 is of the lowest price!");

}

else if(price2<=price1 && price2<=price3){
```

```java
System.out.println("\nProduct 2 is of the lowest price!");

}


else{

System.out.println("\nProduct 3 is of the lowest price!");

}

}

public static void main(String[] args){

System.out.println("Martin Siby");

System.out.println("SJC2MCA-2038");

System.out.println("24-03-2023");

System.out.println("20MCA132");

System.out.println("Object Oriented Programming Lab");

product obj1 = new product();

product obj2 = new product();

product obj3 = new product();

obj1.data(101,"Product_1",100.0);

obj2.data(102,"Product_2",128.40);

obj3.data(103,"Product_3",790.00);

System.out.println("ProductInformation:\nProduct_Code\tProduct_Name\tProduct_Price"
);
```

```
    obj1.display();

    obj2.display();

    obj3.display();

    findLowest(obj1.price,obj2.price,obj3.price);

    }

    }
```

Output:

```
(base) sjcet@Z238-UL:~$ cd martin
(base) sjcet@Z238-UL:~/martin$ cd s2
bash: cd: s2: No such file or directory
(base) sjcet@Z238-UL:~/martin$ cd S2
(base) sjcet@Z238-UL:~/martin/S2$ cd java
(base) sjcet@Z238-UL:~/martin/S2/java$ javac proc
(base) sjcet@Z238-UL:~/martin/S2/java$ java produ
Martin Siby
SJC2MCA-2038
24-03-2023
20MCA132
Object Oriented Programming Lab
Product Information:
 Product_Code    Product_Name      Product_Price
101              Product_1                 100.0
102              Product_2                 128.4
103              Product_3                 790.0

Product 1 is of the lowest price!
(base) sjcet@Z238-UL:~/martin/S2/java$ 
```
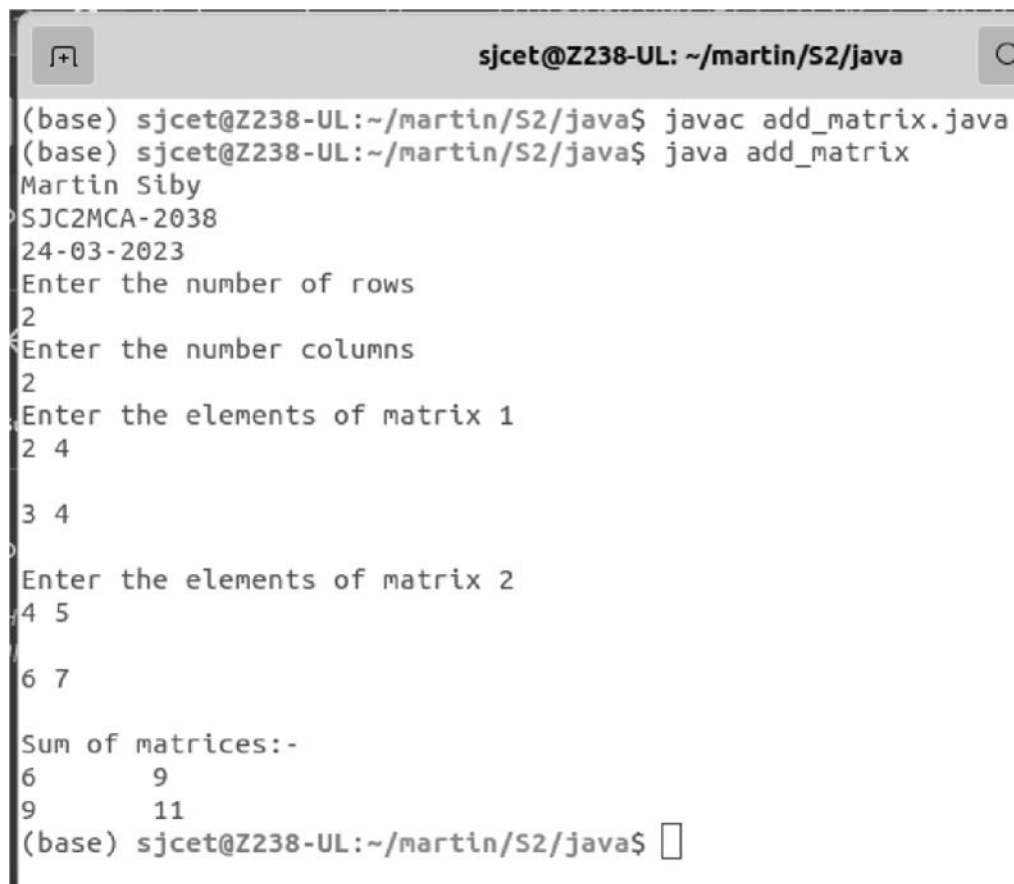
PROGRAM 2

Read 2 matrices from the console and perform matrix addition

CODE:

```
import java.util.Scanner;
public class add_matrix {
public static void main(String args[])
{
int row, col,i,j;
System.out.println("Martin Siby");
System.out.println("SJC2MCA-2038");
System.out.println("24-03-2023");
Scanner in = new Scanner(System.in);
System.out.println("Enter the number of rows");
row = in.nextInt();
System.out.println("Enter the number columns");
col = in.nextInt();
int mat1[][] = new int[row][col];
int mat2[][] = new int[row][col];
int res[][] = new int[row][col];
System.out.println("Enter the elements of matrix 1");
for ( i= 0 ; i < row ; i++ )
{
for ( j= 0 ; j < col ;j++ )
mat1[i][j] = in.nextInt();
System.out.println();
}
System.out.println("Enter the elements of matrix 2");
for ( i= 0 ; i < row ; i++ )
{
for ( j= 0 ; j < col ;j++ )
mat2[i][j] = in.nextInt();
System.out.println();
```

```
        }
    for ( i= 0 ; i < row ; i++ )
    for ( j= 0 ; j < col ;j++ )
    res[i][j] = mat1[i][j] + mat2[i][j] ;
    System.out.println("Sum of matrices:-");
    for ( i= 0 ; i < row ; i++ )
    {
    for ( j= 0 ; j < col ;j++ )
    System.out.print(res[i][j]+"\t");
    System.out.println();
    }
    }
    }
```

Output:

PROGRAM 3

Add complex numbers

Program:

CODE:

```java
public class complex {

int r;

int i;

complex(int real,int img){

r=real;

i=img;

}

void display(){

System.out.println(r+"+"+i+"i");

}

static void add(int r1,int i1,int r2,int i2 ){

r1=r1+r2;

i1=i1+i2;

System.out.println("After Addition = "+r1+"+"+i1+"i");

}

public static void main(String[] args) {

System.out.println("Martin Siby");

System.out.println("SJC2MCA-2038");

System.out.println("24-03-2023");
```

```java
System.out.println("20MCA132");

System.out.println("Object Oriented Programming Lab");a

complex first=new complex(5,4);

complex second=new complex(7,9);

System.out.println("Complex Numbers are:");

first.display();

second.display();

add(first.r,first.i,second.r,second.i);

}
```

Output:


```
┌─┐
└+┘                    sjcet@Z238-UL: ~/martin/S2/java

(base) sjcet@Z238-UL:~/martin/S2/java$ javac complex.java
(base) sjcet@Z238-UL:~/martin/S2/java$ java complex
Martin Siby
SJC2MCA-2038
24-03-2023
20MCA132
Object Oriented Programming Lab
Complex Numbers are:
5+4i
7+9i
After Addition = 12+13i
(base) sjcet@Z238-UL:~/martin/S2/java$ ▯
```
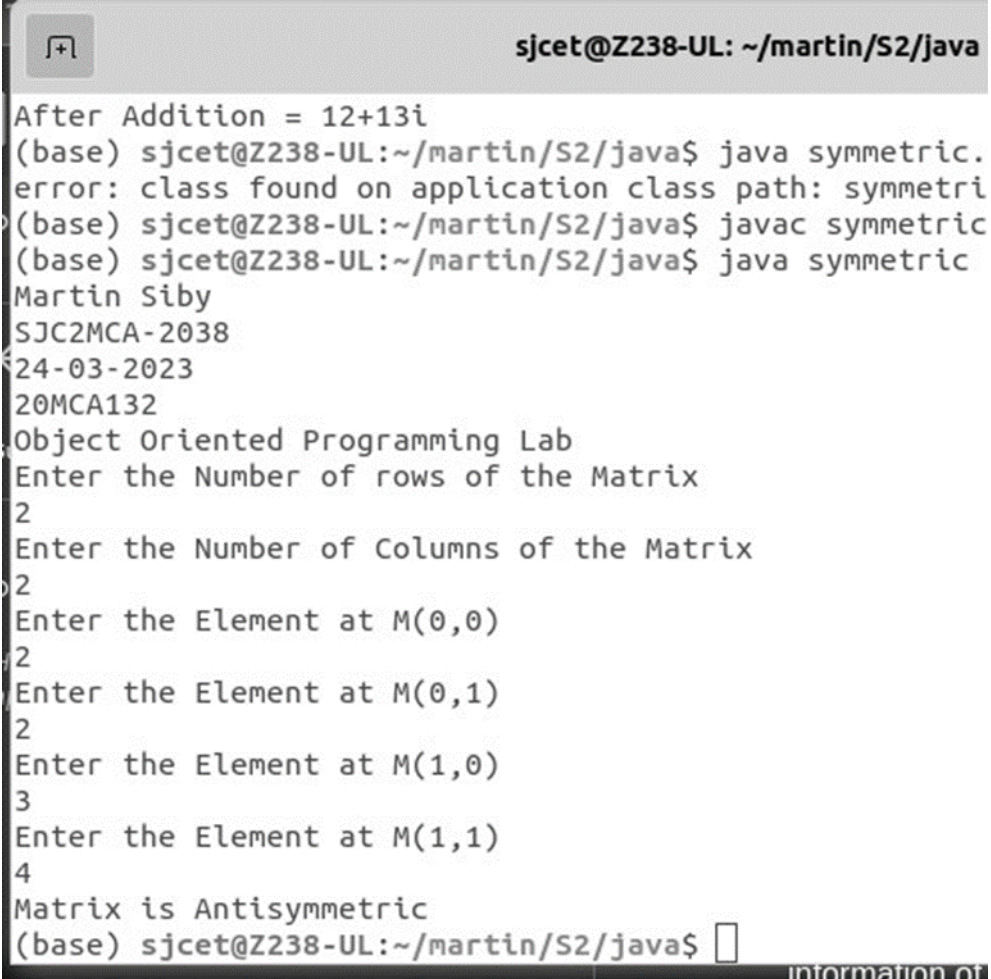
PROGRAM 4

Read a matrix from the console and check whether it is symmetric or not.

CODE:

```
import java.util.Scanner; public class symmetric { public static void main(String[] args) {

System.out.println("Martin Siby"); System.out.println("SJC2MCA-2038");

System.out.println("24-03-2023");

System.out.println("20MCA132");

System.out.println("Object Oriented Programming Lab");     Scanner sc = new
Scanner(System.in);

System.out.println("Enter the Number of rows of the Matrix"); int row = sc.nextInt();

System.out.println("Enter the Number of Columns of the Matrix"); int col = sc.nextInt();
int matrix[][] = new int[row][col];

int i,j;

boolean state=true; for(i=0;i<row;i++){

for(j=0;j<col;j++){

System.out.println("Enter the Element at M("+i+","+j+")");      matrix[i][j] = sc.nextInt();

   }

}

for(i=0;i<row;i++){    for(j=0;j<col;j++){       if(matrix[i][j]!=matrix[j][i]){
state=false;

     break;

   }

  } }

if(state){

System.out.println("Matrix is Symmetric");
```

```
        }

        else{

        System.out.println("Matrix is Antisymmetric");

        }

        }

        }
```

Output:


```
After Addition = 12+13i
(base) sjcet@Z238-UL:~/martin/S2/java$ java symmetric.
error: class found on application class path: symmetri
(base) sjcet@Z238-UL:~/martin/S2/java$ javac symmetric
(base) sjcet@Z238-UL:~/martin/S2/java$ java symmetric
Martin Siby
SJC2MCA-2038
24-03-2023
20MCA132
Object Oriented Programming Lab
Enter the Number of rows of the Matrix
2
Enter the Number of Columns of the Matrix
2
Enter the Element at M(0,0)
2
Enter the Element at M(0,1)
2
Enter the Element at M(1,0)
3
Enter the Element at M(1,1)
4
Matrix is Antisymmetric
(base) sjcet@Z238-UL:~/martin/S2/java$
```
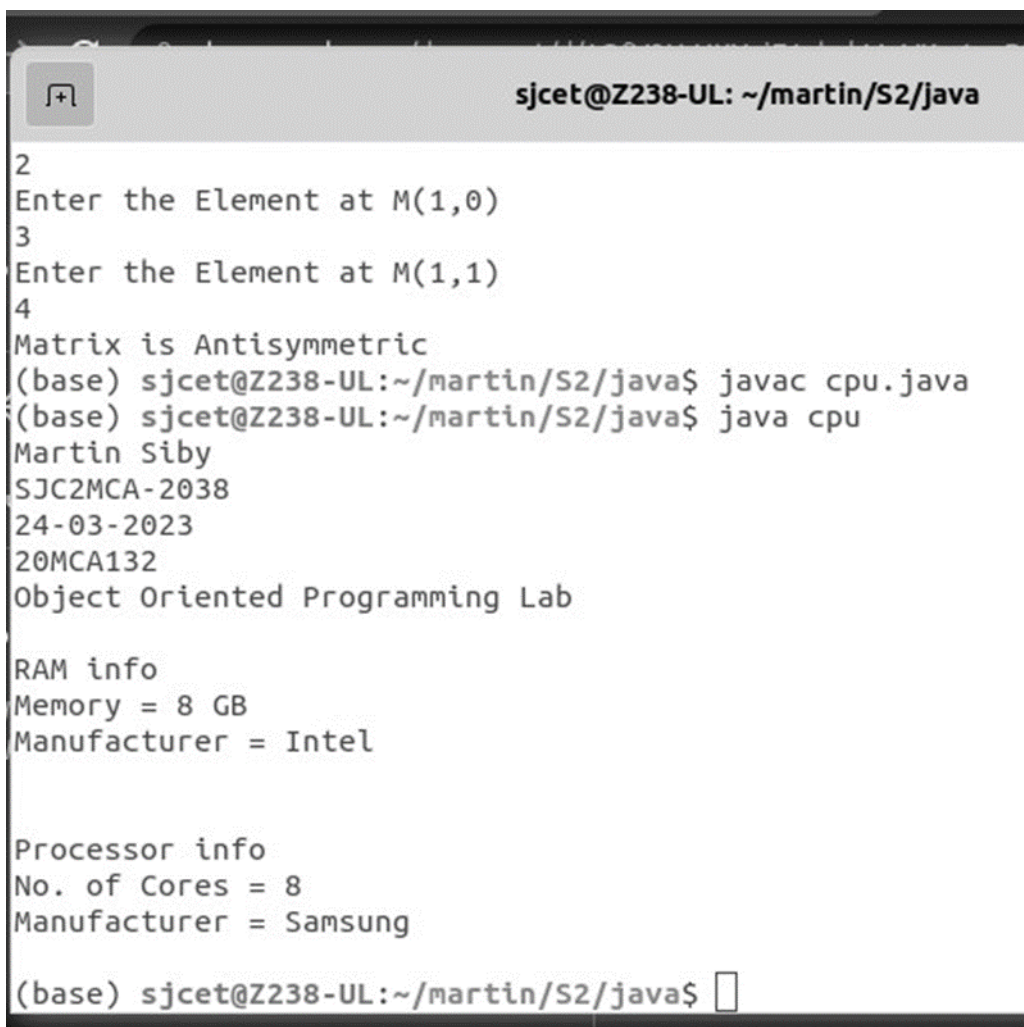
PROGRAM 5

Create CPU with attribute price. Create inner class Processor (no. of cores, manufacturer) and static nested class RAM (memory, manufacturer). Create an object of CPU and print information of Processor and RAM.

CODE:

```java
public class cpu{
int price;
class processor{
int cores;
String producer;
processor(int noC, String manu){
cores=noC;
producer=manu;
}
void display(){
System.out.println("\nProcessor info");
System.out.println("No. of Cores = "+cores);
System.out.println("Manufacturer = "+producer+"\n");
}
}
static class ram{
int mem;
String manuf;
ram(int memory,String producer ){
mem=memory;
manuf=producer;
}
void display(){
System.out.println("\nRAM info");
System.out.println("Memory = "+mem+" GB");
System.out.println("Manufacturer = "+manuf+"\n");
}}
public static void main(String[]args) {
```

```java
        System.out.println("Martin Siby");

        System.out.println("SJC2MCA-2038");

        System.out.println("24-03-2023");

        System.out.println("20MCA132");

        System.out.println("Object Oriented Programming Lab");

        cpu.ram obj1= new cpu.ram(8,"Intel");

        cpu obj2 = new cpu();

        cpu.processor obj3 = obj2.new processor(8,"Samsung");

        obj1.display();

        obj3.display();

    }

}
```
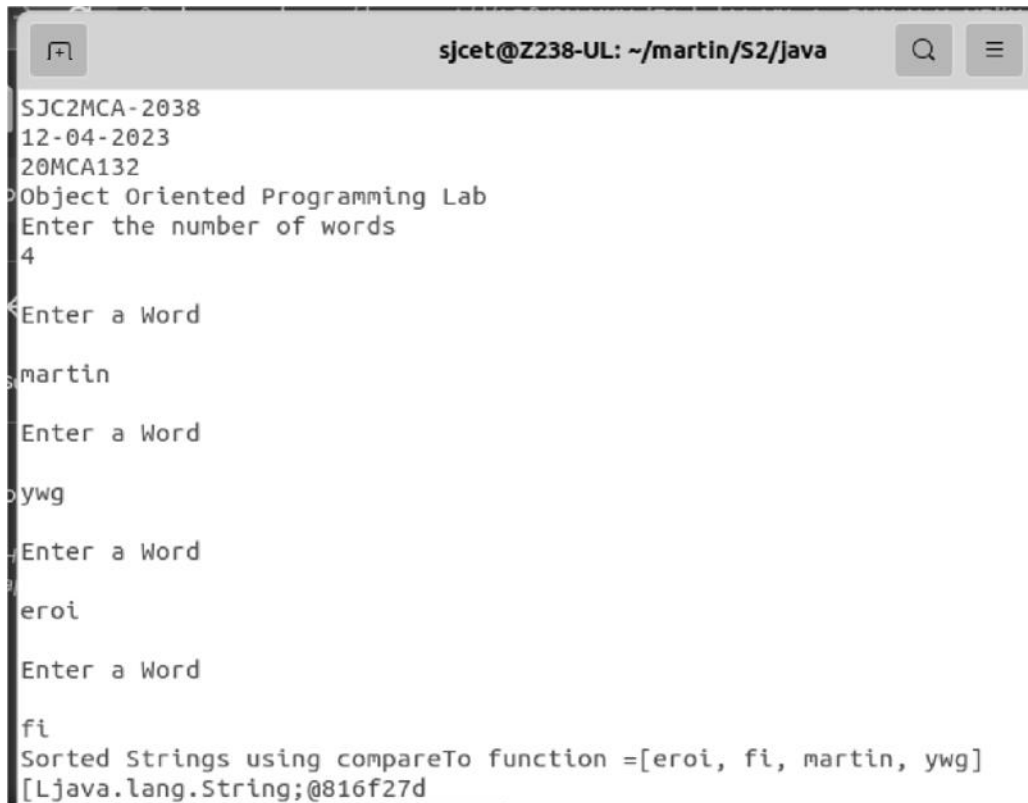
Output:

PROGRAM 6

Program to Sort strings

CODE:

```java
import java.util.Scanner;
import java.util.Arrays;
public class sort {
public static void main(String[]
      args) {
int i,j;
System.out.println("Martin Siby");
System.out.println("SJC2MCA-
      2038");
System.out.println("12-04-2023");
System.out.println("20MCA132");
System.out.println("Object
      Oriented Programming Lab");
Scanner sc = new
      Scanner(System.in);
System.out.println("Enter the
      number of words");
int num=sc.nextInt();
String word[]=new String[num];
sc.nextLine();
for( i=0;i<num;i++){
System.out.println("\nEnter a
      Word\n");
word[i]=sc.nextLine();
}
for( i=0;i<num-1;i++){
for( j=i+1;j<num;j++){
if(word[i].compareTo(word[j])>0)
      {
String temp = word[i];
word[i]=word[j];
```

```
        word[j]=temp;
    }
    }
    }
System.out.println("Sorted Strings
        using compareTo function
="+Arrays.toString(word));
System.out.println(word);
}}
```

Output:


```
SJC2MCA-2038
12-04-2023
20MCA132
Object Oriented Programming Lab
Enter the number of words
4

Enter a Word

martin

Enter a Word

ywg

Enter a Word

eroi

Enter a Word

fi
Sorted Strings using compareTo function =[eroi, fi, martin, ywg]
[Ljava.lang.String;@816f27d
```

PROGRAM 7

Search an element in an array.

CODE:

```java
import java.util.Scanner;

public class Search {

public static void main(String[] args) {

int i,j,x=0;

boolean state = false;

System.out.println("Martin Siby");

System.out.println("SJC2MCA-2038");

System.out.println("12-04-2023");

System.out.println("20MCA132");

System.out.println("Object Oriented Programming Lab");

Scanner sc = new Scanner(System.in);

System.out.println("Enter the number of elemets in array");

int num=sc.nextInt();

String word[]=new String[num];

sc.nextLine();

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

System.out.println("\nEnter a Word\n");

word[i]=sc.nextLine();

}

System.out.println("Enter the element to Search");

String search = sc.nextLine();

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

if(word[i].equals(search)){
```
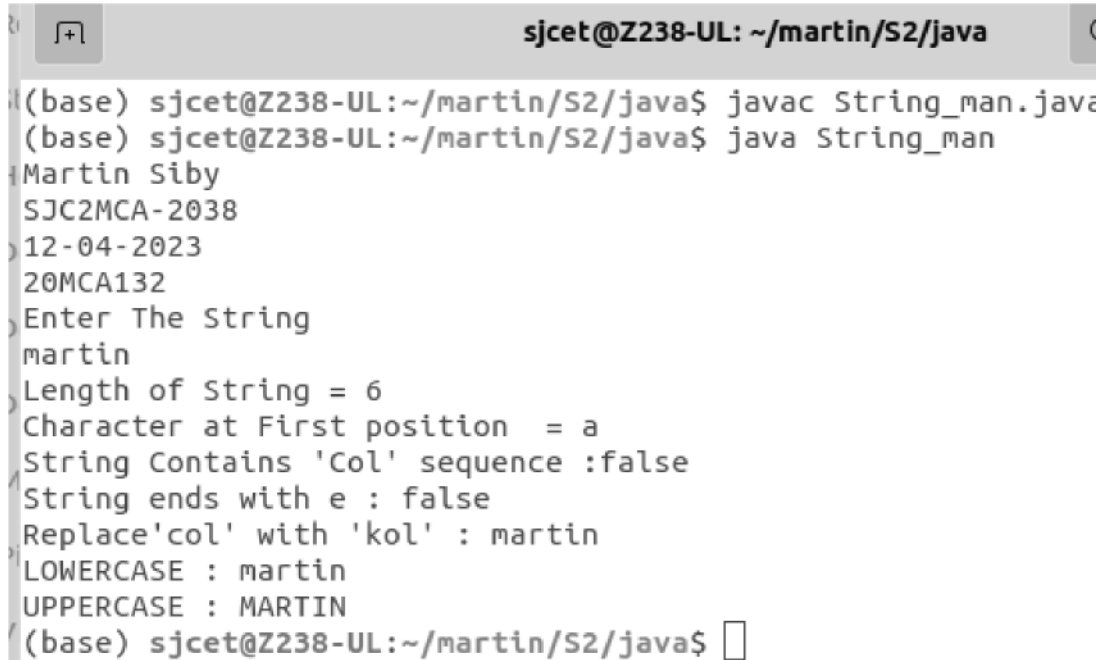
```
x = i;

state = true;

}

}

if(state){

System.out.println("Element found at position = "+x);

}

else{

System.out.println("Element found not found");

}

}}
```
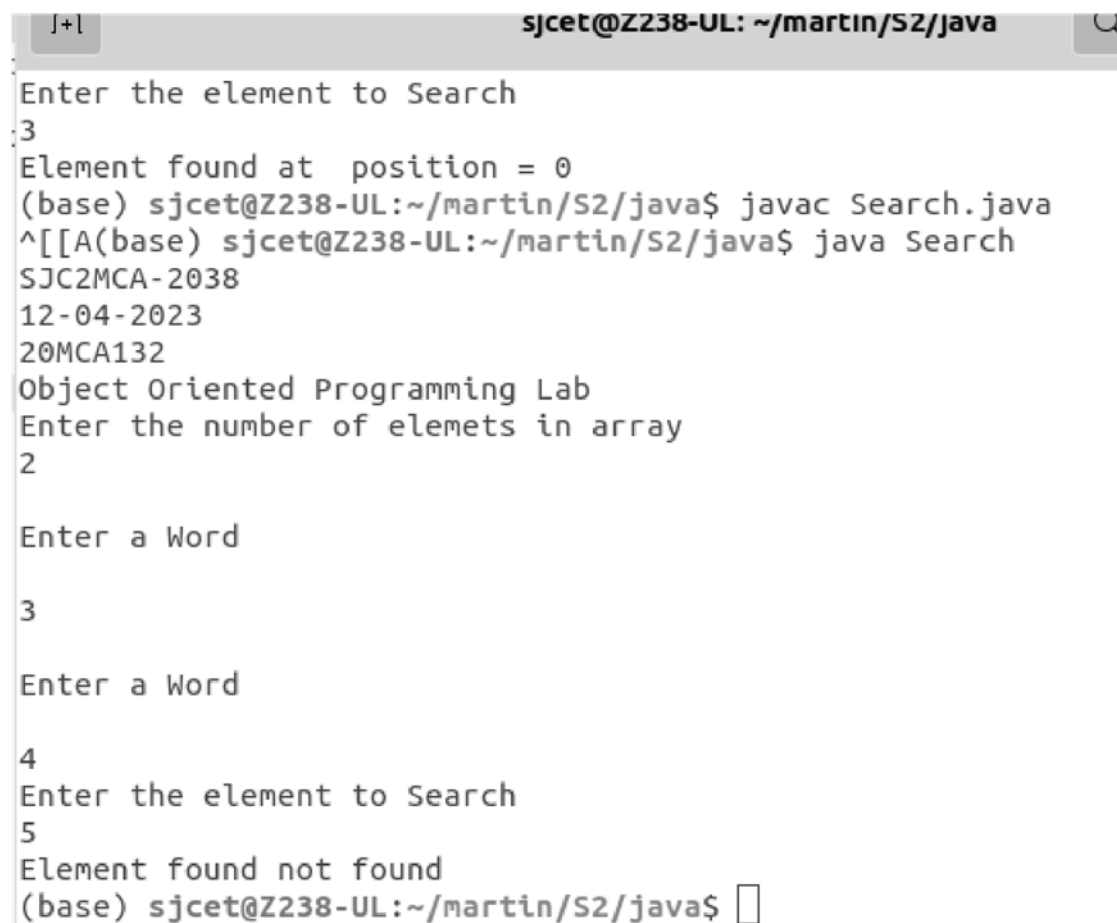
Output:

PROGRAM 8

Perform string manipulations

CODE:

```java
import java.util.Scanner;
public class String_man{
public static void main(String[] args) {
System.out.println("Martin Siby");
System.out.println("SJC2MCA-2038");
System.out.println("12-04-2023");
System.out.println("20MCA132");
System.out.println("Enter The String");
Scanner sc = new Scanner(System.in);
String str1 = sc.nextLine();
System.out.println("Length of String =
"+str1.length());
System.out.println("Character at First
position = "+str1.charAt(1));
System.out.println("String Contains 'Col'
sequence :"+str1.contains("Col"));
System.out.println("String ends with e :
"+str1.endsWith("e"));
System.out.println("Replace'col' with
'kol' : "+str1.replaceAll("Col","kol"));
System.out.println("LOWERCASE :
"+str1.toLowerCase());
System.out.println("UPPERCASE :
"+str1.toUpperCase());
}
}
```

Output:

```
sjcet@Z238-UL: ~/martin/S2/java

(base) sjcet@Z238-UL:~/martin/S2/java$ javac String_man.java
(base) sjcet@Z238-UL:~/martin/S2/java$ java String_man
Martin Siby
SJC2MCA-2038
12-04-2023
20MCA132
Enter The String
martin
Length of String = 6
Character at First position  = a
String Contains 'Col' sequence :false
String ends with e : false
Replace'col' with 'kol' : martin
LOWERCASE : martin
UPPERCASE : MARTIN
(base) sjcet@Z238-UL:~/martin/S2/java$
```

PROGRAM 9

Program to create a class for Employee having attributes eNo, eName eSalary. Read n employ information and Search for an employee given eNo, using the concept of Array of Objects.

CODE:

```java
import java.util.Scanner;

public class employee {

int eNo;

String eName;

double eSalary;

public void getdetails(){

System.out.println("\nEnter the Employee details");

Scanner sc = new Scanner(System.in);

System.out.println("Employee number : ");

eNo=sc.nextInt();

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

sc.nextLine();

eName=sc.nextLine();

System.out.println("Salary : ");

eSalary=sc.nextDouble();

}

void display(){

System.out.println("Empolyee No :"+eNo);

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

System.out.println("Salary Amount"+eSalary+"\n");

}

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

```java
        System.out.println("Martin Siby");

        System.out.println("SJC2MCA-2038");

        System.out.println("12-04-2023");

        System.out.println("20MCA132");

        System.out.println("\nEnter the No. of Employee's");

        Scanner sc1 = new Scanner(System.in);


        int num = sc1.nextInt();

        employee arr[]=new employee[num];

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

          arr[i]=new employee();

          arr[i].getdetails();

          }

          System.out.println("\nInformations of all the employee's");

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

          arr[i].display();

          }

          boolean state = false;

          System.out.println("\nEnter the Employee Number to get details of a

          employee");

          int num2= sc1.nextInt();

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

          if(arr[i].eNo==num2){

          System.out.println("\nEmployee details");

          arr[i].display();

          }

          }

          }

          }
```
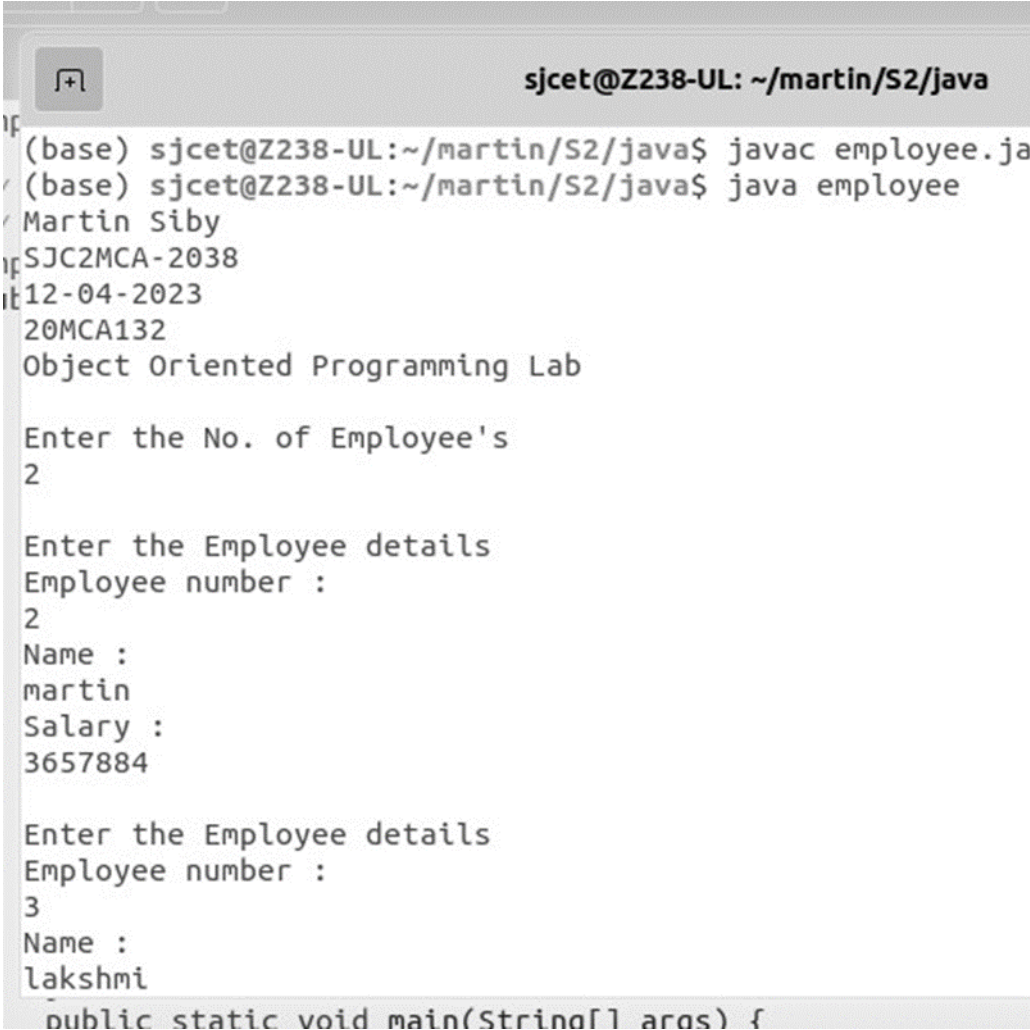
Output:

```
                              sjcet@Z238-UL: ~/martin/S2/java
 ⌐+⌐

(base) sjcet@Z238-UL:~/martin/S2/java$ javac employee.ja
(base) sjcet@Z238-UL:~/martin/S2/java$ java employee
Martin Siby
SJC2MCA-2038
12-04-2023
20MCA132
Object Oriented Programming Lab

Enter the No. of Employee's
2

Enter the Employee details
Employee number :
2
Name :
martin
Salary :
3657884

Enter the Employee details
Employee number :
3
Name :
lakshmi

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