PROGRAM 1

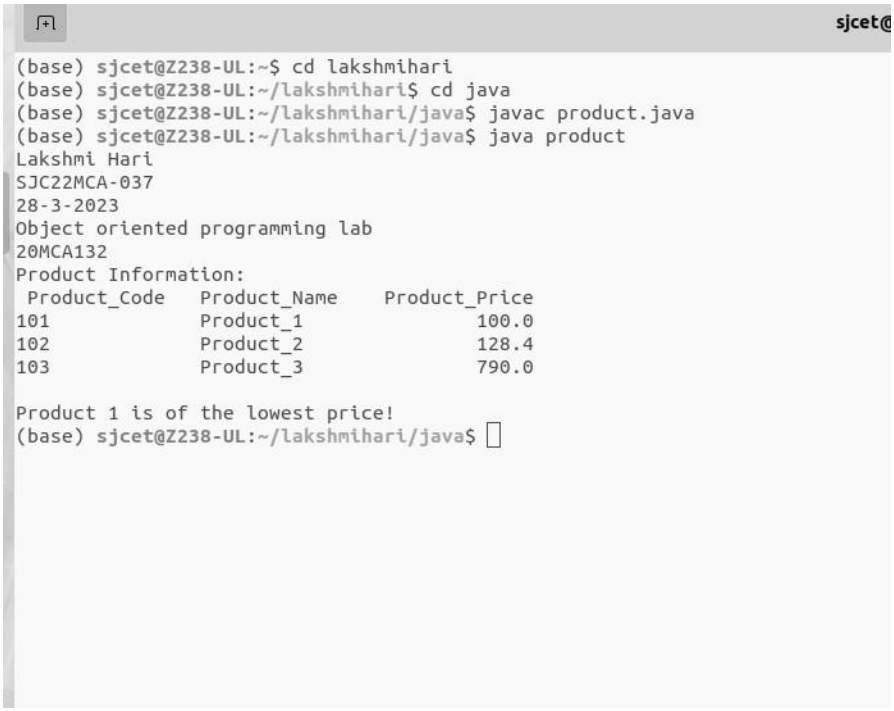
Define a class 'product' with data members pcode, pname and price. Create 3 objects of the class and find the product having the lowest price.

CODE :

```
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){
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){
product obj1 = new product();
product obj2 = new product();
product obj3 = new product();
System.out.println("Lakshmi Hari");
System.out.println("SJC22MCA-037");
System.out.println("28-3-2023");
System.out.println("Object oriented programming lab");
System.out.println("20MCA132");
obj1.data(101,"Product_1",100.0);
obj2.data(102,"Product_2",128.40);
obj3.data(103,"Product_3",790.00);
System.out.println("Product Information:\n
Product_Code\tProduct_Name\tProduct_Price");
obj1.display();
obj2.display();
obj3.display();
```

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

OUTPUT :



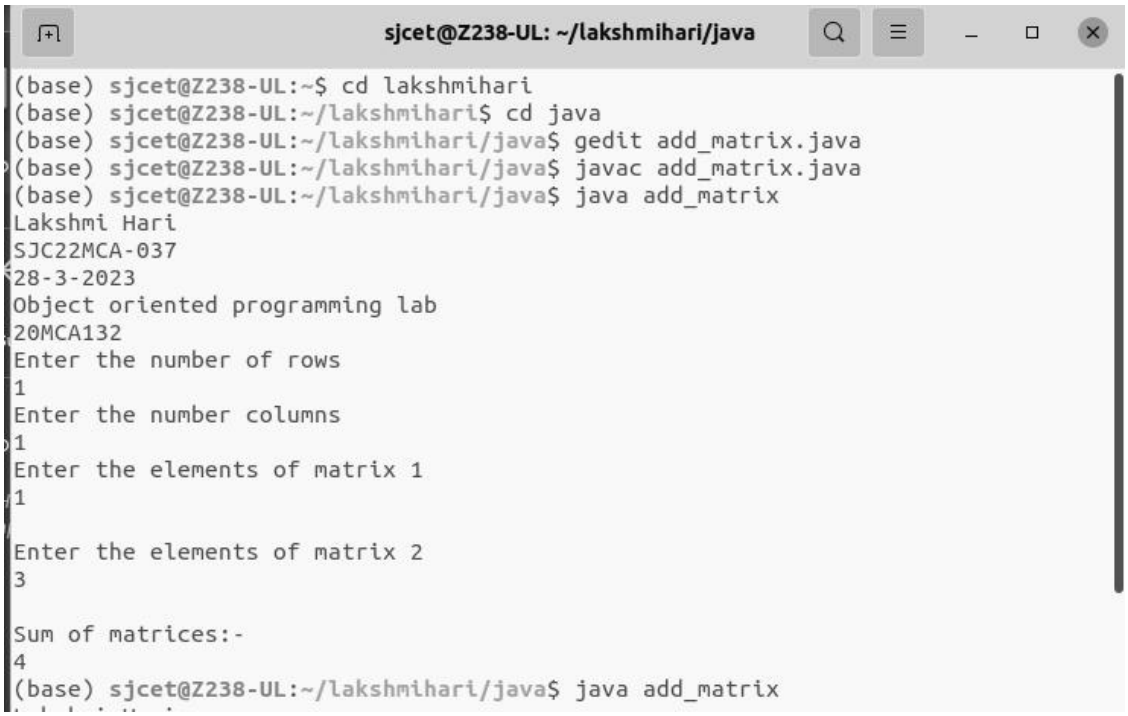
PROGRAM 2 :

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("Lakshmi Hari");
System.out.println("SJC22MCA-037");
System.out.println("28-3-2023");
System.out.println("Object oriented programming lab");
System.out.println("20MCA132");
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 :


sjcet@Z238-UL: ~/lakshmihari/java
(base) sjcet@Z238-UL:~$ cd lakshmihari
(base) sjcet@Z238-UL:~/lakshmihari$ cd java
(base) sjcet@Z238-UL:~/lakshmihari/java$ gedit add_matrix.java
(base) sjcet@Z238-UL:~/lakshmihari/java$ javac add_matrix.java
(base) sjcet@Z238-UL:~/lakshmihari/java$ java add_matrix
Lakshmi Hari
SJC22MCA-037
28-3-2023
Object oriented programming lab
20MCA132
Enter the number of rows
1
Enter the number columns
1
Enter the elements of matrix 1
1
Enter the elements of matrix 2
3
Sum of matrices:-
4
(base) sjcet@Z238-UL:~/lakshmihari/java$ java add_matrix

PROGRAM 3 :

Add complex numbers

CODE :

```
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("Lakshmi Hari");System.out.println("SJC22MCA-037");
System.out.println("28-3-2023");
System.out.println("Object oriented programming lab");
System.out.println("20MCA132");
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 :

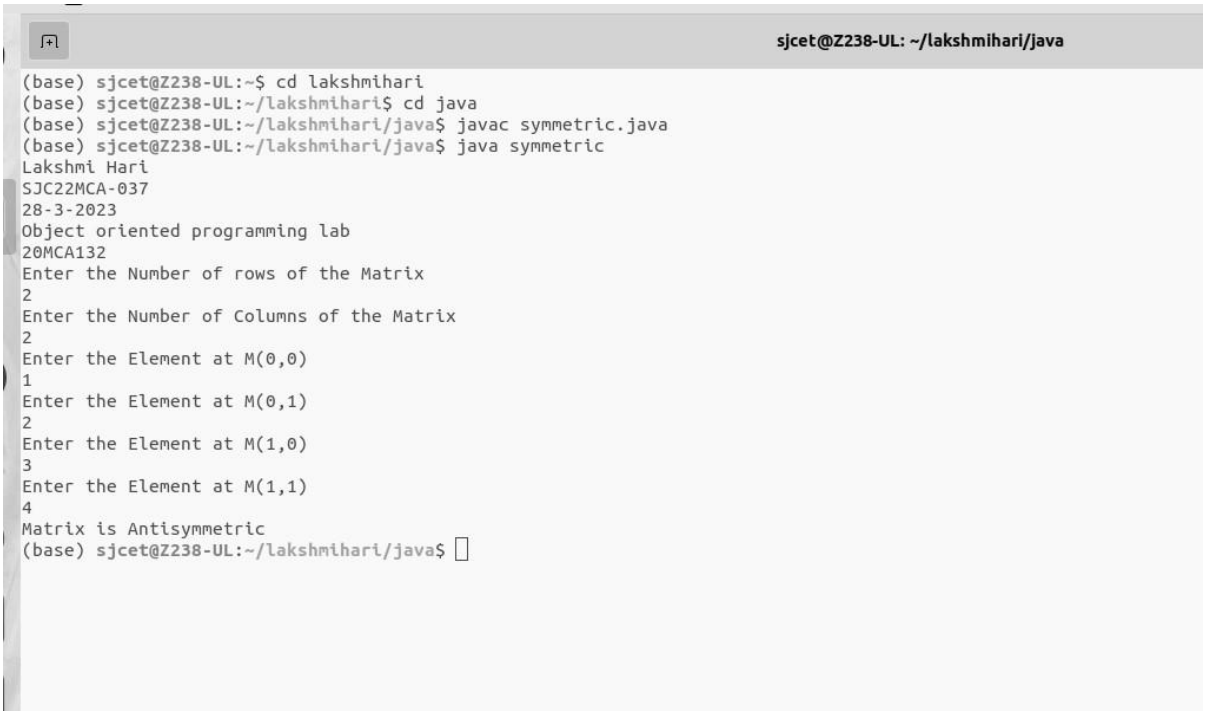
PROGRAM 4 :

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("Lakshmi Hari");
System.out.println("SJC22MCA-037");
System.out.println("28-3-2023");
System.out.println("Object oriented programming lab");
System.out.println("20MCA132");
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 :


sjcet@Z238-UL: ~/lakshmihari/java
(base) sjcet@Z238-UL:~$ cd lakshmihari
(base) sjcet@Z238-UL:~/lakshmihari$ cd java
(base) sjcet@Z238-UL:~/lakshmihari/java$ javac symmetric.java
(base) sjcet@Z238-UL:~/lakshmihari/java$ java symmetric
Lakshmi Hari
SJC22MCA-037
28-3-2023
Object oriented programming lab
20MCA132
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)
1
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:~/lakshmihari/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 :

```
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) {
System.out.println("Lakshmi Hari");
System.out.println("SJC22MCA-037");
System.out.println("28-3-2023");
System.out.println("Object oriented programming lab");
System.out.println("20MCA132");
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 :


sjcet@Z238-UL: ~/lakshmihari/java
(base) sjcet@Z238-UL:~$ cd lakshmihari
(base) sjcet@Z238-UL:~/lakshmihari$ cd java
(base) sjcet@Z238-UL:~/lakshmihari/java$ gedit cpu.java
(base) sjcet@Z238-UL:~/lakshmihari/java$ javac cpu.java
(base) sjcet@Z238-UL:~/lakshmihari/java$ java cpu
Lakshmi Hari
SJC22MCA-037
28-3-2023
Object oriented programming lab
20MCA132
RAM info
Memory = 8 GB
Manufacturer = Intel
Processor info
No. of Cores = 8
Manufacturer = Samsung
(base) sjcet@Z238-UL:~/lakshmihari/java$

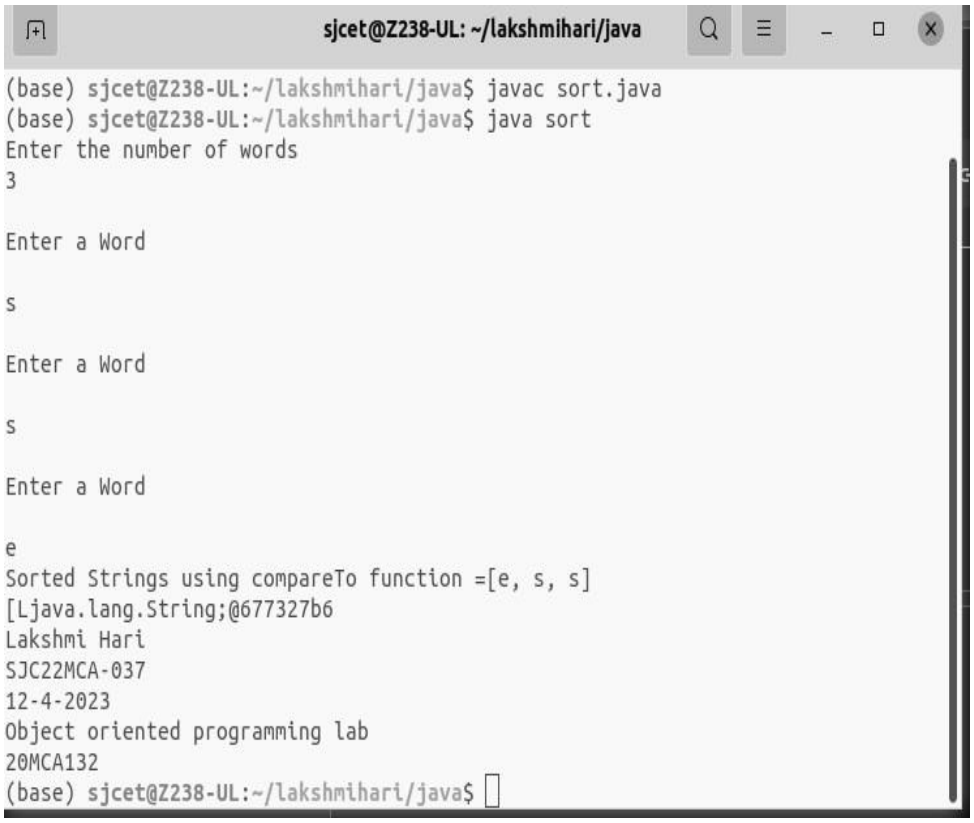
PROGRAM 6 :

Program to Sort strings

CODE :

```
import java.util.Scanner;
import java.util.Arrays;
public class sort {
public static void main(String[] args) {
int i,j;
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);
System.out.println("Lakshmi Hari");
System.out.println("SJC22MCA-037");
System.out.println("12-4-2023");
System.out.println("Object oriented programming lab");
System.out.println("20MCA132");
}}
```

OUTPUT :


sjcet@Z238-UL: ~/lakshmihari/java
(base) sjcet@Z238-UL:~/lakshmihari/java$ javac sort.java
(base) sjcet@Z238-UL:~/lakshmihari/java$ java sort
Enter the number of words
3
Enter a Word
s
Enter a Word
s
Enter a Word
e
Sorted Strings using compareTo function =[e, s, s]
[Ljava.lang.String;@677327b6
Lakshmi Hari
SJC22MCA-037
12-4-2023
Object oriented programming lab
20MCA132
(base) sjcet@Z238-UL:~/lakshmihari/java$

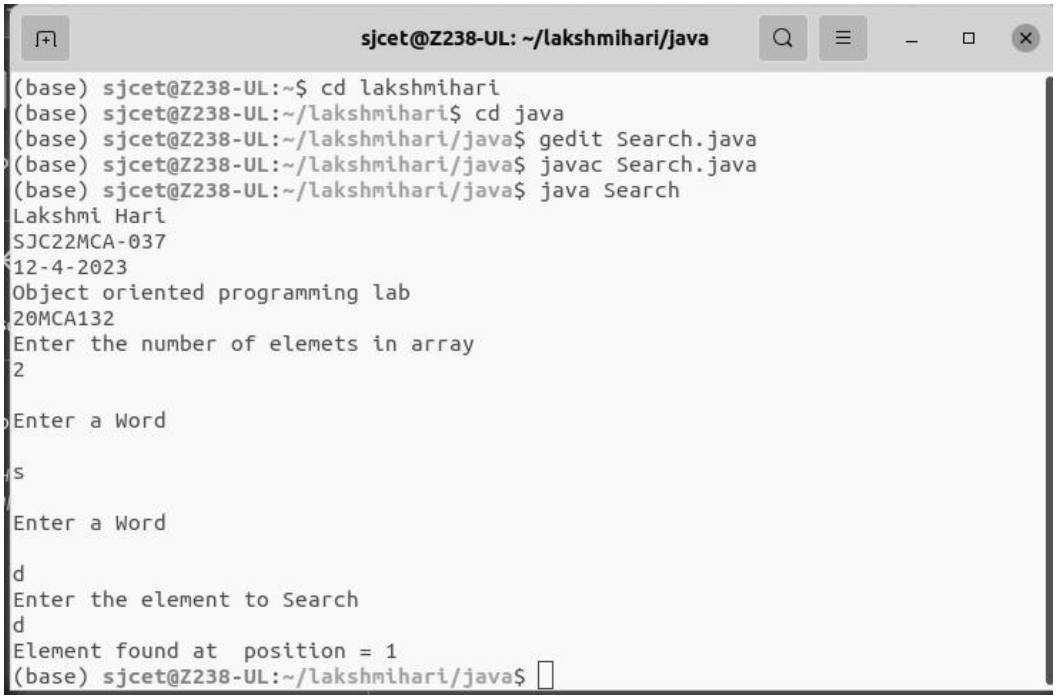
PROGRAM 7 :

Search an element in an array.

CODE :

```
import java.util.Scanner;
public class Search {
public static void main(String[] args) {
int i,j,x=0;
boolean state = false;
System.out.println("Lakshmi Hari");
System.out.println("SJC22MCA-037");
System.out.println("12-4-2023");
System.out.println("Object oriented programming lab");
System.out.println("20MCA132");
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 :


sjcet@Z238-UL: ~/lakshmihari/java
(base) sjcet@Z238-UL:~$ cd lakshmihari
(base) sjcet@Z238-UL:~/lakshmihari$ cd java
(base) sjcet@Z238-UL:~/lakshmihari/java$ gedit Search.java
(base) sjcet@Z238-UL:~/lakshmihari/java$ javac Search.java
(base) sjcet@Z238-UL:~/lakshmihari/java$ java Search
Lakshmi Hari
SJC22MCA-037
12-4-2023
Object oriented programming lab
20MCA132
Enter the number of elemets in array
2
Enter a Word
s
Enter a Word
d
Enter the element to Search
d
Element found at position = 1
(base) sjcet@Z238-UL:~/lakshmihari/java$

PROGRAM 8 :

Perform string manipulations.

CODE :

```
import java.util.Scanner;
public class String_man{
public static void main(String[] args) {
System.out.println("Lakshmi Hari");
System.out.println("SJC22MCA-037");
System.out.println("12-4-2023");
System.out.println("Object oriented programming lab");
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 :

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 :

```
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) {
System.out.println("Lakshmi Hari");
System.out.println("SJC22MCA-037");
System.out.println("12-4-2023");
System.out.println("Object oriented programming lab");
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 :