LAB CYCLE-1

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;
 int price;
 String pname;
 void getdata(int p1,String p2,int p3)
 {
  pcode=p1;
  pname=p2;
  price=p3;
 }
 public static void main(String[] args)
 {
  System.out.println("Name : Anna Jose");
  System.out.println("Register Number : SJC22MCA-2008");
  System.out.println("Course Name : Object Oriented Programming Lab");
  System.out.println("Course Code : 20MCA132");
  System.out.println("Date : 24/03/2023");

  int smallest;
  product obj1 = new product();
  product obj2 = new product();
  product obj3 = new product();
     obj1.getdata(1111,"Refrigerator",200000);
     obj2.getdata(1112,"Washing Machine",50000);
     obj3.getdata(1113,"Television",150000);
  if(obj1.price<obj2.price)
  {
    if(obj3.price<obj1.price)
    {
      smallest=obj3.price;
    }
    else
```

```
    {
      smallest=obj1.price;
    }
  }
  else
  {
    if(obj2.price<obj3.price)
    {
      smallest=obj2.price;
    }
    else
    {
      smallest=obj3.price;
    }
  }
  System.out.println("The cheapest price is : "+smallest);
 }
}
```

OUTPUT:

```
(base) sjcet@Z238-UL:~/anna08/S2/java/co1$ javac product.java
(base) sjcet@Z238-UL:~/anna08/S2/java/co1$ java product
Name : Anna Jose
Register Number : SJC22MCA-2008
Course Name : Object Oriented Programming Lab
Course Code : 20MCA132
Date : 24/03/2023
The cheapest price is : 50000
```

2.Read 2 matrices from the console and perform matrix addition.

CODE:

```
import java.util.*;
public class Matrix
{
public static void main(String[] args)
{
System.out.println("Name : Anna Jose");
System.out.println("Register Number : SJC22MCA-2008");
System.out.println("Course Name : Object Oriented Programming Lab");
System.out.println("Course Code : 20MCA132");
System.out.println("Date : 24/03/2023");

int r,c;
Scanner x = new Scanner (System.in);
System.out.println("Number of rows");
r=x.nextInt();
System.out.println("Number of coloumn");
c=x.nextInt();
  int m1[][]=new int[r][c];
  int m2[][]=new int[r][c];
  int m3[][] = new int[r][c];
          System.out.println("Enter all the elements of first matrix:");
          for (int i = 0; i < r; i++)
          {
             for (int j = 0; j < c; j++)
             {
                m1[i][j] = x.nextInt();
             }
          }
          System.out.println("");
          System.out.println("Enter all the elements of second matrix:");
          for (int i = 0; i < r; i++)
          {
             for (int j = 0; j < c; j++)
             {
                m2[i][j] = x.nextInt();
             }
```

```
    }
    System.out.println("");
    System.out.println("First Matrix:");
    for (int i = 0; i < r; i++)
    {
       for (int j = 0; j < c; j++)
       {
          System.out.print(m1[i][j]+" ");
       }
       System.out.println("");
    }
    System.out.println("Second Matrix:");
    for (int i = 0; i < r; i++)
    {
       for (int j = 0; j < c; j++)
       {
          System.out.print(m2[i][j]+" ");
       }
       System.out.println("");
    }
    for (int i = 0; i < r; i++)
    {
       for (int j = 0; j < c; j++)
       {
          for (int k = 0; k < c; k++)
          {
             m3[i][j] = m1[i][j] + m2[i][j];
          }
       }
    }
    System.out.println("Matrix after addition:");
    for (int i = 0; i < r; i++)
    {
       for (int j = 0; j < c; j++)
       {
          System.out.print(m3[i][j]+" ");
       }
       System.out.println("");
    }
  }
```

```
}
```

OUTPUT:

```
(base) sjcet@Z238-UL:~/anna08/S2/java/co1$ javac Matrix.java
(base) sjcet@Z238-UL:~/anna08/S2/java/co1$ java Matrix
Name : Anna Jose
Register Number : SJC22MCA-2008
Course Name : Object Oriented Programming Lab
Course Code : 20MCA132
Date : 24/03/2023
Number of rows
2
Number of coloumn
2
Enter all the elements of first matrix:
1
2
3
4

Enter all the elements of second matrix:
7
8
9
10

First Matrix:
1 2
3 4
Second Matrix:
7 8
9 10
Matrix after addition:
8 10
12 14
```

3.Add complex numbers.

CODE:

```
class ComplexNumber
{
   int real, image;
   public ComplexNumber(int r, int i)
   {
      this.real = r;
      this.image = i;
   }
   public void showC()
   {
      System.out.print(this.real + " +i" + this.image);
   }
   public static ComplexNumber add(ComplexNumber n1,
                           ComplexNumber n2)
   {
      ComplexNumber res = new ComplexNumber(0, 0);
      res.real = n1.real + n2.real;
      res.image = n1.image + n2.image;
      return res;
   }

   public static void main(String arg[])
   {
      System.out.println("Name : Anna Jose");
      System.out.println("Register Number : SJC22MCA-2008");
      System.out.println("Course Name : Object Oriented Programming Lab");
      System.out.println("Course Code : 20MCA132");
      System.out.println("Date : 28/03/2023");
      ComplexNumber c1 = new ComplexNumber(4, 5);
      ComplexNumber c2 = new ComplexNumber(10, 5);
      System.out.print("first Complex number: ");
      c1.showC();
      System.out.print("\nSecond Complex number: ");
      c2.showC();
      ComplexNumber res = add(c1, c2);
      System.out.println("\nAddition is :");
```

```
        res.showC();
    }
}
```

OUTPUT:

```
(base) sjcet@Z238-UL:~/anna08/S2/java/co1$ javac ComplexNumber.java
(base) sjcet@Z238-UL:~/anna08/S2/java/co1$ java ComplexNumber
Name : Anna Jose
Register Number : SJC22MCA-2008
Course Name : Object Oriented Programming Lab
Course Code : 20MCA132
Date : 28/03/2023
first Complex number: 4 +i5
Second Complex number: 10 +i5
Addition is :
14 +i10(base) sjcet@Z238-UL:~/anna08/S2/java/co1$
```

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

CODE:

```
import java.util.*;
class symmetric
{
public static void main(String args[])
{
System.out.println("Name : Anna Jose");
System.out.println("Register Number : SJC22MCA-2008");
System.out.println("Course Name : Object Oriented Programming Lab");
System.out.println("Course Code : 20MCA132");
System.out.println("Date : 28/03/2023");
Scanner sc = new Scanner(System.in);
int i,j,r,c,flag=1;
System.out.println("Enter the number of rows:");
r = sc.nextInt();
System.out.println("Enter the number of columns:");
c = sc.nextInt();
int[][] m = new int[r][c];
int [][] transpose = new int[r][c];
System.out.println("Enter the elements of the matrix") ;
for(i=0;i<r;i++)
{
for(j=0;j<c;j++)
{
m[i][j] = sc.nextInt();
}
}
System.out.println("The elements of the matrix") ;
for(i=0;i<r;i++)
{
for(j=0;j<c;j++)
{
System.out.print(m[i][j]+"\t");
}
System.out.println("");
}
for(i=0;i<r;i++)
```

```
{
for(j=0;j<c;j++)
{
transpose[j][i]=m[i][j];
}
}
if(r==c)
{
for(i=0;i<r;i++)
{
for(j=0;j<c;j++)
{
if(m[i][j]!=transpose[i][j])
{
flag=0;
break;
}
}
if(flag==0)
{
System.out.print("\nThe matrix is not symmetric");
break;
}
}
if(flag==1)
{
System.out.print("\nThe matrix is symmetric\n");
}
}
else
{
System.out.print("\nThe matrix is not symmetric\n");
}
}
}
```

OUTPUT:

```
(base) sjcet@Z238-UL:~/anna08/S2/java/co1$ javac symmetric.java
(base) sjcet@Z238-UL:~/anna08/S2/java/co1$ java symmetric
Name : Anna Jose
Register Number : SJC22MCA-2008
Course Name : Object Oriented Programming Lab
Course Code : 20MCA132
Date : 28/03/2023
Enter the number of rows:
2
Enter the number of columns:
2
Enter the elements of the matrix
1
2
3
4
The elements of the matrix
1       2
3       4

The matrix is not symmetric(base) sjcet@Z238-UL:~/anna08/S2/java/co1$ javac symmetric.java
(base) sjcet@Z238-UL:~/anna08/S2/java/co1$ java symmetric
Name : Anna Jose
Register Number : SJC22MCA-2008
Course Name : Object Oriented Programming Lab
Course Code : 20MCA132
Date : 28/03/2023
Enter the number of rows:
2
Enter the number of columns:
2
Enter the elements of the matrix
1
2
2
1
The elements of the matrix
1       2
2       1

The matrix is symmetric
```

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("Name : Anna Jose");
       System.out.println("Register Number : SJC22MCA-2008");
       System.out.println("Course Name : Object Oriented Programming Lab");
       System.out.println("Course Code : 20MCA132");
       System.out.println("Date : 28/03/2023");
```

```
        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:

```
(base) sjcet@Z238-UL:~/anna08/S2/java/co1$ gedit cpu.java
(base) sjcet@Z238-UL:~/anna08/S2/java/co1$ javac cpu.java
(base) sjcet@Z238-UL:~/anna08/S2/java/co1$ java cpu
Name : Anna Jose
Register Number : SJC22MCA-2008
Course Name : Object Oriented Programming Lab
Course Code : 20MCA132
Date : 28/03/2023

RAM info
Memory = 8 GB
Manufacturer = Intel


Processor info
No. of Cores = 8
Manufacturer = Samsung
```