

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;
    int price;

    public Product(int pCode, String pname, int price) {
        this.pCode = pCode;
        this.pname = pname;
        this.price = price;
    }

    public void display() {
        System.out.println("Product code : " + pCode);
        System.out.println("Product name : " + pname);
        System.out.println("Price : " + price);
    }

    public static void main(String[] args) {

        System.out.println("Name : TOBIN K TOMY\nRoll No : 23MCA059\nDate : 14/02/2024");
        System.out.println("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.");

        Product p1 = new Product(1, "Bag", 5000);
        Product p2 = new Product(2, "Light", 1000);
        Product p3 = new Product(3, "Watch", 7000);

        System.out.println("Displaying p1");
        p1.display();

        System.out.println("Displaying p2");
        p2.display();

        System.out.println("Displaying p3");
        p3.display();

        if(p1.price < p2.price && p1.price < p3.price){
```

```
        System.out.println("Displaying lowest price");
        p1.display();
    }else if (p2.price < p3.price && p2.price < p1.price) {
        System.out.println("Displaying lowest price");
        p2.display();
    } else {
        System.out.println("Displaying lowest price");
        p3.display();
    }

}

}
```

Output :

```
Name : TOBIN K TOMY
Roll No : 23MCA059
Date : 14/02/2024
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.
Displaying p1
Product code : 1
Product name : Bag
Price : 5000
Displaying p2
Product code : 2
Product name : Light
Price : 1000
Displaying p3
Product code : 3
Product name : Watch
Price : 7000
Displaying lowest price
Product code : 2
Product name : Light
Price : 1000
```

2. Read 2 matrices from the console and perform matrix addition.**Code :**

```
import java.util.Scanner;
public class MatrixAdd{
public static void main(String[] args){
System.out.println("Name : TOBIN K TOMY\nRoll No : 23MCA059\nDate :
14/02/2024");
System.out.println("Program 2: Read 2 matrices from the console and perform
matrix addition.");
int p,q,m,n;
Scanner s= new Scanner(System.in);

System.out.println("Enter number of rows in first matrix:");
p=s.nextInt();
System.out.println("Enter number of columns in first matrix:");
q=s.nextInt();
System.out.println("Enter number of rows in second matrix:");
m=s.nextInt();
System.out.println("Enter number of columns in second matrix:");
n=s.nextInt();

if (p==m && q==n)
{
int a[][]=new int[p][q];
int b[][]=new int[m][n];
int c[][]=new int[m][n];

System.out.println("Enter all the elements of first matrix:");
for(int i=0;i<p;i++)
for(int j=0;j<q;j++)
a[i][j]=s.nextInt();

System.out.println("Enter all the elements of second matrix:");
for(int i=0;i<m;i++)
for(int j=0;j<n;j++)
b[i][j]=s.nextInt();

System.out.println("first matrix:");
for(int i=0;i<p;i++){
for(int j=0;j<q;j++)
{
System.out.print(a[i][j]+" ");
}
}
System.out.println(" ");
```

```
}

System.out.println("second matrix:");
for(int i=0;i<m;i++){
for(int j=0;j<n;j++)
{
System.out.print(b[i][j]+"\\t");
}
System.out.println(" ");
}

for(int i=0;i<p;i++)
for(int j=0;j<n;j++)
c[i][j]=a[i][j]+b[i][j];

System.out.println("matrix after addition:");
for(int i=0;i<p;i++){
for(int j=0;j<n;j++){
System.out.print(c[i][j]+"\\t");
}
System.out.println(" ");
}
}
else
{
System.out.println("Addition not possible");
}
}
}
```

Output :

```
Name : TOBIN K TOMY
Roll No : 23MCA059
Date : 14/02/2024
Program 2: Read 2 matrices from the console and perform matrix addition.
Enter number of rows in first matrix:
2
Enter number of columns in first matrix:
2
Enter number of rows in second matrix:
2
Enter number of columns in second matrix:
2
Enter all the elements of first matrix:
1
2
3
4
Enter all the elements of second matrix:
5
6
7
8
first matrix:
1      2
3      4
second matrix:
5      6
7      8
matrix after addition:
6      8
10     12
```

3. Add complex numbers

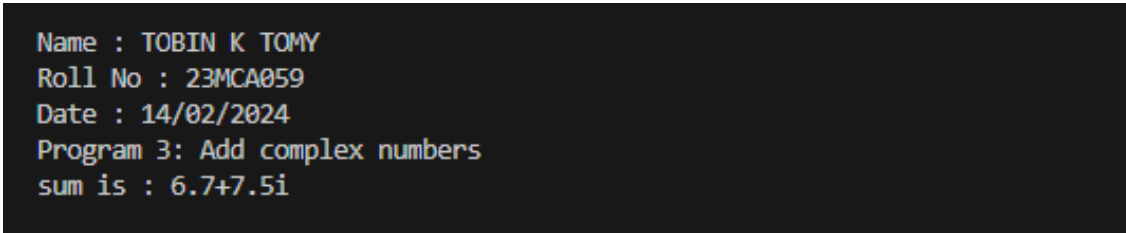
Code :

```
public class ComplexNumber{
double real,img;

ComplexNumber(double r,double i){
this.real=r;
this.img=i;
}

public static ComplexNumber sum(ComplexNumber c1, ComplexNumber c2){
ComplexNumber temp=new ComplexNumber(0,0);

temp.real=c1.real+c2.real;
temp.img=c1.img+c2.img;
return temp;
}
public static void main(String args[]){
System.out.println("Name : TOBIN K TOMY\nRoll No : 23MCA059\nDate :
14/02/2024");
System.out.println("Program 3: Add complex numbers");
ComplexNumber c1=new ComplexNumber(5.5,4);
ComplexNumber c2=new ComplexNumber(1.2,3.5);
ComplexNumber temp=sum(c1,c2);
System.out.print("sum is : "+temp.real+" "+temp.img+"i");
}
}
```

Output :A screenshot of a terminal window with a black background and white text. The output shows the program's execution results, including the user's name, roll number, date, program title, and the calculated sum of two complex numbers.

```
Name : TOBIN K TOMY
Roll No : 23MCA059
Date : 14/02/2024
Program 3: Add complex numbers
sum is : 6.7+7.5i
```

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

```
import java.util.Scanner;
public class SymmetricMatrixProgram{
public static void main(String[] args){
System.out.println("Name : TOBIN K TOMY\nRoll No : 23MCA059\nDate :
14/02/2024");
System.out.println("Program 4: Read a matrix from the console and check whether
it is symmetric or not.");
Scanner sc=new Scanner(System.in);

System.out.println("Enter the no of rows");
int rows=sc.nextInt();

System.out.println("Enter the no of columns");
int cols=sc.nextInt();

int matrix[][]=new int[rows][cols];
System.out.println("Enter the elements");

for(int i=0;i<rows;i++)
for(int j=0;j<cols;j++)
matrix[i][j]=sc.nextInt();
sc.close();
System.out.println("Printing the input matrix");
for(int i=0;i<rows;i++)
{
for(int j=0;j<cols;j++)
System.out.print(matrix[i][j]+"\\t");
System.out.println();
}

if(rows!=cols)
System.out.println("The given matrix is not a square matrix");
else
{
boolean symmetric=true;
for(int i=0;i<rows;i++)
for(int j=0;j<cols;j++)
if(matrix[i][j]!=matrix[j][i])
{
symmetric=false;
break;
}
}
```

```
if(symmetric)
{
System.out.println("The given matrix is symmetric");
}
else
{
System.out.println("The given matrix is not symmetric");
}
}
}
}
```

Output :

```
Name : TOBIN K TOMY
Roll No : 23MCA059
Date : 14/02/2024
Program 4: Read a matrix from the console and check whether it is
symmetric or not.
Enter the no of rows
3
Enter the no of columns
3
Enter the elements
2
4
4
4
8
8
4
8
8
Printing the input matrix
2      4      4
4      8      8
4      8      8
The given 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 :

```
class CPU{
double price;
class Processor{
double cores;
String manufacturer;

double getCache(){
return 4.3;
}
}

protected class RAM{
double memory;
String manufacturer;

double getClockSpeed(){
return 5.5;
}
}

public class CPUDetails{
public static void main(String[] args){
System.out.println("Name : TOBIN K TOMY\nRoll No : 23MCA059\nDate :
14/02/2024");
System.out.println("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.");

CPU cpu = new CPU();
CPU.Processor processor=cpu.new Processor();
CPU.RAM ram=cpu.new RAM();
System.out.println("Processor Cache : "+processor.getCache());
System.out.println("Ram Clock speed : "+ram.getClockSpeed());
}
}
```

Output :

```
Name : TOBIN K TOMY  
Roll No : 23MCA059  
Date : 14/02/2024  
Program 5: Create CPU with attribute price. Create inner class Processor (  
no. of cores, manufacturer) and static nested class RAM (memory, manufactu  
rer). Create an object of CPU and print information of Processor and RAM.  
Processor Cache : 4.3  
Ram Clock speed : 5.5
```