

Course Outcome 1 (CO1):

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.
2. Read 2 matrices from the console and perform matrix addition.
3. Add complex numbers
4. Read a matrix from the console and check whether it is symmetric or not.
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.

ANSWERS

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.

Program

```
class product{
int pcode;
String pname;
float price;
void getdat( int x,String y,float z){
pcode=x;
pname=y;
price=z;
}
void showdata(){
System.out.println("product code= "+pcode+ " product name= " +pname+" product price= "+price);
}
}

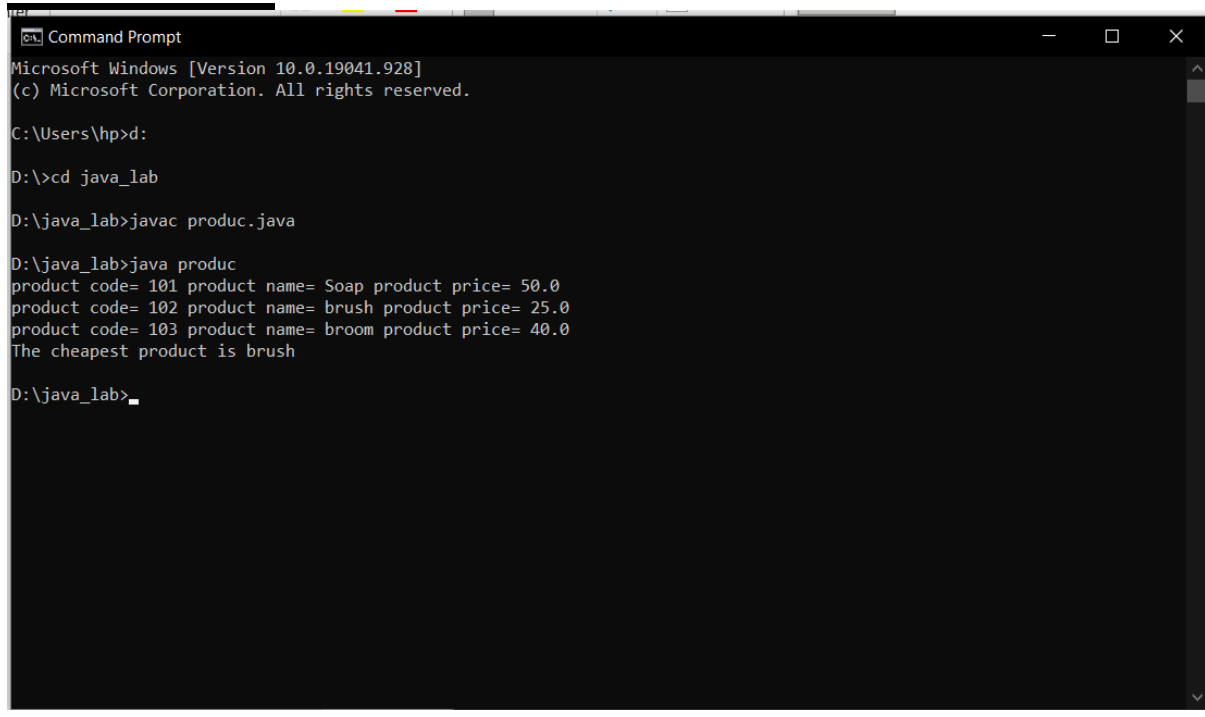
public class produc{
public static void main(String[] args){
product p1=new product();
product p2=new product();
product p3=new product();
p1.getdat(101,"Soap",50);
p2.getdat(102,"brush",25);
p3.getdat(103,"broom",40);
p1.showdata();
p2.showdata();
```

```

p3.showdata();
if ((p1.price)<(p2.price)&&(p1.price)<(p3.price))
{
System.out.println("The cheapest product is "+p1.pname);
}
else if ((p2.price)<(p1.price)&&(p2.price)<(p3.price))
{
System.out.println("The cheapest product is "+p2.pname);
}
else
{
System.out.println("The cheapest product is "+p3.pname);
}
}
}
}

```

OUTPUT



```

Microsoft Windows [Version 10.0.19041.928]
(c) Microsoft Corporation. All rights reserved.

C:\Users\hp>d:

D:\>cd java_lab

D:\java_lab>javac produc.java

D:\java_lab>java produc
product code= 101 product name= Soap product price= 50.0
product code= 102 product name= brush product price= 25.0
product code= 103 product name= broom product price= 40.0
The cheapest product is brush

D:\java_lab>_

```

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

Program

```

import java.util.Scanner;
class matadd
{
    public static void main(String[] args){
        int row,col,i,j;
        Scanner sc= new Scanner(System.in);

```

```

        System.out.println("Enter the number of rows");
        row = sc.nextInt();
        System.out.println("Enter the no. of columns");
        col = sc.nextInt();

        int mat1[][]=new int [row][col];
        int mat2[][]=new int [row][col];
        int mat3[][]=new int [row][col];

        System.out.println("Enter the matrix");
        for(i=0;i<row;i++)
        {
            for(j=0;j<col;j++)
            {
                mat1[i][j]=sc.nextInt();
            }
            System.out.println();
        }
        System.out.println("Enter the matrix");
        for(i=0;i<row;i++)
        {
            for(j=0;j<col;j++)
            {
                mat2[i][j]=sc.nextInt();
            }
            System.out.println();
        }
        for(i=0;i<row;i++)
        {
            for(j=0;j<col;j++)
            {
                mat3[i][j]=mat1[i][j]+mat2[i][j];
            }
        }
        System.out.println("The sum of the matrix is");
        for(i=0;i<row;i++)
        {
            for(j=0;j<col;j++)
            {
                System.out.println(mat3[i][j]);
            }
        }
        System.out.println();
    }
}
}

```

OUTPUT

```
Command Prompt
D:\java_lab>java matadd
Enter the number of rows
2
Enter the no. of columns
3
Enter the matrix
3
1
5
4
5
2
Enter the matrix
2
5
2
1
4
2
The sum of the matrix is
5
6
7
5
9
4
D:\java_lab>
```

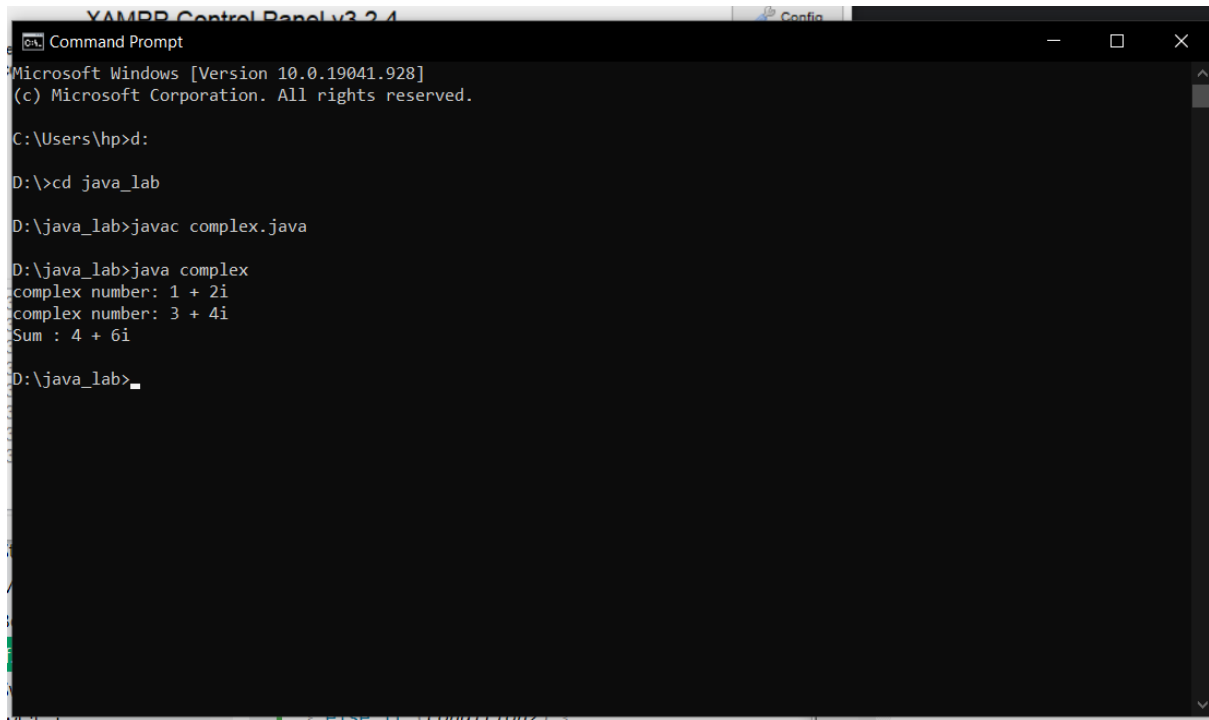
3. Add complex numbers

PROGRAM

```
class comple
{
int real;
int imaginary;
void getdata(int x, int y)
{
real=x;
imaginary=y;
}
void showdata()
{
System.out.println("complex number: "+real+ " + "+imaginary+"i");
}
}
public class complex {
public static void main(String[] args){
comple o1=new comple();
comple o2=new comple();
o1.getdata(1,2);
o2.getdata(3,4);
o1.showdata();
o2.showdata();
}
```

```
System.out.println("Sum : "+(o1.real+o2.real)+ " + " +(o1.imaginary+o2.imaginary)+"i");  
}  
}
```

OUTPUT



```
YAMPP Control Panel v3.2.4  
Microsoft Windows [Version 10.0.19041.928]  
(c) Microsoft Corporation. All rights reserved.  
C:\Users\hp>d:  
D:\>cd java_lab  
D:\java_lab>javac complex.java  
D:\java_lab>java complex  
complex number: 1 + 2i  
complex number: 3 + 4i  
Sum : 4 + 6i  
D:\java_lab>_
```

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

PROGRAM

```
import java.util.Scanner;  
class Sym1  
{  
public static void main(String[] args)  
{  
int row,col,i,j;  
int x=0;  
Scanner ob= new Scanner(System.in);  
System.out.print("Enter the number of Rows of matrix:");  
row=ob.nextInt();  
System.out.print("Enter the number of columns of matrix:");  
col=ob.nextInt();  
if(col==row)  
{  
System.out.println("Since the No. of Row is eqaul to No.of Columuns \nMatrix can become Symmetric");  
}  
}
```

```
else
{
System.out.println("No. of Rows and Colum must be same");
System.exit(0);//to exit the program
}
int mat[][]=new int[row][col];
System.out.println("Enter the Matrix");
for(i=0;i<row;i++)
{
```

```
for(j=0;j<col;j++)
{
mat[i][j]=ob.nextInt();
}
System.out.println();
}
for(i=0;i<row;i++)
{
for(j=0;j<row;j++)
{
if (mat[i][j]==mat[j][i])
{
x=1;
//System.out.println("Given matrix are Symmetric");
break;
}
else
{
x=0;
//System.out.println("Given matrix are not a symmetric matrix");
break;
}
}
}
if (x==1)
{
System.out.println("Given Matrix is Symmetric.");
}
else
```

```

{
System.out.println("Given Matrix is not Symmetric.");
}
}
}

```

OUTPUT

```

D:\java_lab>java Sym1
Enter the number of Rows of matrix:2
Enter the number of columns of matrix:2
Since the No. of Row is equal to No.of Columns
Matrix can become Symmetric
Enter the Matrix
2
4
4
2
Given Matrix is Symmetric.

D:\java_lab>java Sym1
Enter the number of Rows of matrix:2
Enter the number of columns of matrix:3
No. of Rows and Colum must be same

D:\java_lab>java Sym1
Enter the number of Rows of matrix:2
Enter the number of columns of matrix:2
Since the No. of Row is equal to No.of Columns
Matrix can become Symmetric
Enter the Matrix
2
3
2
2
Given Matrix is not 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.

PROGRAM

```

class CPU
{
double x=1000.00;
class Processor
{
int y=10;
String i="Microsoft";
static class Ram
{
String j="5GB";
String k="Intel";
}
}
}
public class ch
{
public static void main(String[] args)

```

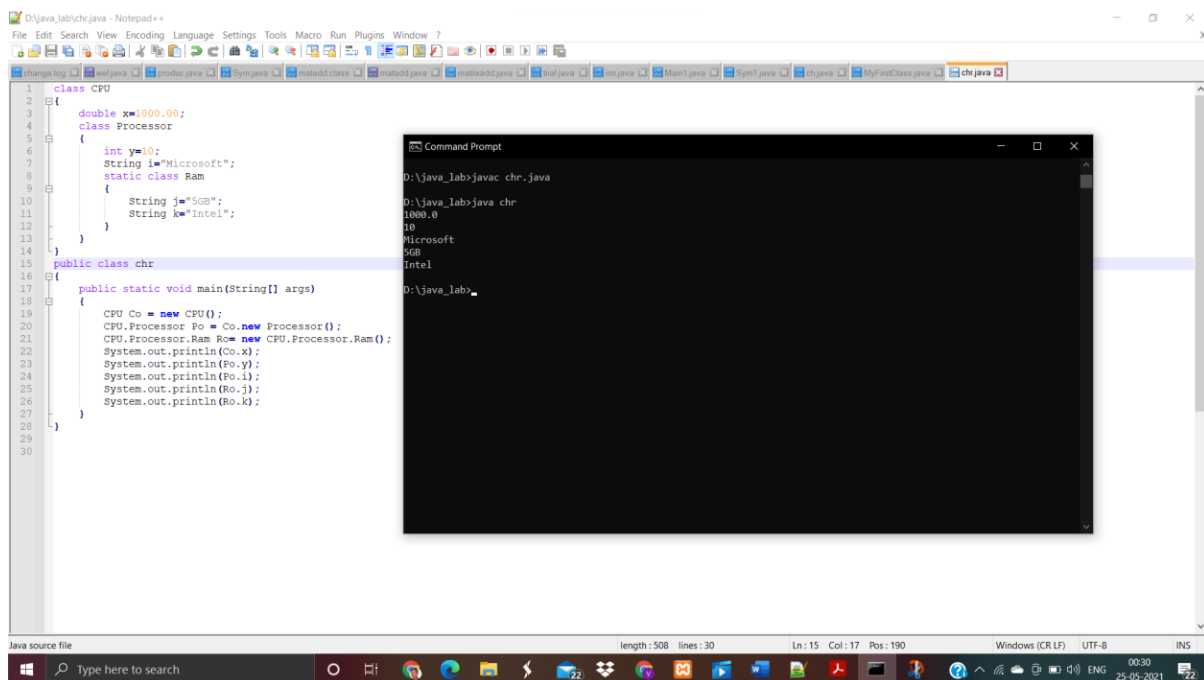


```

{
CPU Co = new CPU();
CPU.Processor Po = Co.new Processor();
CPU.Processor.Ram Ro= new CPU.Processor.Ram();
System.out.println(Co.x);
System.out.println(Po.y);
System.out.println(Po.i);
System.out.println(Ro.j);
System.out.println(Ro.k);
}
}

```

OUTPUT



The screenshot shows a Windows desktop environment. In the foreground, a Notepad++ window is open, displaying the Java source code for the CPU, Processor, and chr classes. The code is as follows:

```

1 class CPU
2 {
3     double x=1000.00;
4     class Processor
5     {
6         int y=10;
7         String i="Microsoft";
8         static class Ram
9         {
10             String j="5GB";
11             String k="Intel";
12         }
13     }
14 }
15 public class chr
16 {
17     public static void main(String[] args)
18     {
19         CPU Co = new CPU();
20         CPU.Processor Po = Co.new Processor();
21         CPU.Processor.Ram Ro= new CPU.Processor.Ram();
22         System.out.println(Co.x);
23         System.out.println(Po.y);
24         System.out.println(Po.i);
25         System.out.println(Ro.j);
26         System.out.println(Ro.k);
27     }
28 }
29
30

```

In the background, a Command Prompt window is open, showing the output of the Java program. The output is as follows:

```

D:\java_lab>javac chr.java
D:\java_lab>java chr
1000.0
10
Microsoft
5GB
Intel
D:\java_lab>

```

The Command Prompt window also shows the command prompt and the output of the Java program, which matches the output shown in the Notepad++ window.