

Course Outcome 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.

```
import java.util.Scanner;

public class Product {
    int pcode;
    String pname;
    double price;

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

    public static void main(String[] args) {
        Scanner input = new Scanner(System.in);

        Product p1, p2, p3;

        System.out.println("Enter the details of 3 products:");

        System.out.print("Enter the product code of product 1: ");
        int pcode1 = input.nextInt();
        input.nextLine();
        System.out.print("Enter the name of product 1: ");
        String pname1 = input.nextLine();
        System.out.print("Enter the price of product 1: ");
        double price1 = input.nextDouble();

        p1 = new Product(pcode1, pname1, price1);

        System.out.print("Enter the product code of product 2: ");
```

```

int pcode2 = input.nextInt();
input.nextLine();
System.out.print("Enter the name of product 2: ");
String pname2 = input.nextLine();
System.out.print("Enter the price of product 2: ");
double price2 = input.nextDouble();

p2 = new Product(pcode2, pname2, price2);

System.out.print("Enter the product code of product 3: ");
int pcode3 = input.nextInt();
input.nextLine(); // Consume the leftover newline character
System.out.print("Enter the name of product 3: ");
String pname3 = input.nextLine();
System.out.print("Enter the price of product 3: ");
double price3 = input.nextDouble();

p3 = new Product(pcode3, pname3, price3);

System.out.println("\nProduct Details");
System.out.println("-----");
System.out.println("Product 1: " + p1.pcode + ", " + p1.pname + ", " + p1.price);
System.out.println("Product 2: " + p2.pcode + ", " + p2.pname + ", " + p2.price);
System.out.println("Product 3: " + p3.pcode + ", " + p3.pname + ", " + p3.price);

Product lowestPriceProduct = p1;

if (p2.price < lowestPriceProduct.price) {
    lowestPriceProduct = p2;
}

if (p3.price < lowestPriceProduct.price) {
    lowestPriceProduct = p3;
}

System.out.println("\nThe product with the lowest price is: " +
lowestPriceProduct.pname);
}
}

```

```
Enter the details of 3 products:
Enter the product code of product 1: 1
Enter the name of product 1: adidas
Enter the price of product 1: 2000
Enter the product code of product 2: 2
Enter the name of product 2: nike
Enter the price of product 2: 4000
Enter the product code of product 3: 3
Enter the name of product 3: puma
Enter the price of product 3: 1000

Product Details
-----
Product 1: 1, adidas, 2000.0
Product 2: 2, nike, 4000.0
Product 3: 3, puma, 1000.0

The product with the lowest price is: puma
```

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

```
import java.util.Scanner;
```

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

```
        System.out.println("Name: Ashish P S");
        System.out.println("Reg. No: SJC22MCA-2015");
        System.out.println("Date: 28/03/2023");
        System.out.println("Course code: 20MCA132");
        System.out.println();
```

```
Scanner sc = new Scanner(System.in);
```

```
System.out.print("Enter the number of rows: ");  
int rows = sc.nextInt();  
System.out.print("Enter the number of columns: ");  
int cols = sc.nextInt();
```

```
int[][] matrix1 = new int[rows][cols];  
int[][] matrix2 = new int[rows][cols];  
int[][] sum = new int[rows][cols];
```

```
System.out.println("Enter the elements of the first matrix:");  
for (int i = 0; i < rows; i++) {  
    for (int j = 0; j < cols; j++) {  
        matrix1[i][j] = sc.nextInt();  
    }  
}
```

```
System.out.println("Enter the elements of the second matrix:");  
for (int i = 0; i < rows; i++) {  
    for (int j = 0; j < cols; j++) {  
        matrix2[i][j] = sc.nextInt();  
    }  
}
```

```
for (int i = 0; i < rows; i++) {  
    for (int j = 0; j < cols; j++) {  
        sum[i][j] = matrix1[i][j] + matrix2[i][j];  
    }  
}
```

```

        System.out.println("The sum of the matrices is:");
        for (int i = 0; i < rows; i++) {
            for (int j = 0; j < cols; j++) {
                System.out.print(sum[i][j] + " ");
            }
            System.out.println();
        }

        sc.close();
    }
}

```

```

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Enter the number of rows: 2
Enter the number of columns: 2
Enter the elements of the first matrix:
1
2
3
4
Enter the elements of the second matrix:
5
6
7
8
The sum of the matrices is:
6 8
10 12

```

3. Add complex numbers

```
public class complex
```

```
{
    int real;
    int imaginary;

    public complex(int real_get,int imag_get){
        this.real = real_get;
        this.imaginary = imag_get;
    }
    public static complex sum(complex c1,complex c2){
        complex temp = new complex(0,0);
        temp.real = c1.real + c2.real;
        temp.imaginary = c1.imaginary + c2.imaginary;
        return temp;
    }
    public static void main(String []args){

        System.out.println("Name: Ashish P S");
        System.out.println("Reg. No: SJC22MCA-2015");
        System.out.println("Date: 28/03/2023");
        System.out.println("Course code: 20MCA132");
        System.out.println();

        complex first = new complex(1,2);
        complex second = new complex(32,22);
        complex temp = sum(first,second);
        System.out.println("Sum is : " + temp.real + "+" +temp.imaginary + "i");
    }
}
```

```
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Enter the real and imaginary parts of the first complex number:
2
5
Enter the real and imaginary parts of the second complex number:
15
2
The sum of the complex numbers is: 17.0 + 7.0i
```

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

```
import java.util.Scanner;
```

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

```
        System.out.println("Name: Ashish P S");
        System.out.println("Reg. No: SJC22MCA-2015");
        System.out.println("Date: 28/03/2023");
        System.out.println("Course code: 20MCA132");
        System.out.println();
```

```
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the number of rows and columns of the
matrix:");
        int rows = sc.nextInt();
        int cols = sc.nextInt();
```

```
int[][] matrix = new int[rows][cols];

System.out.println("Enter the elements of the matrix:");
for (int i = 0; i < rows; i++) {
    for (int j = 0; j < cols; j++) {
        matrix[i][j] = sc.nextInt();
    }
}
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) {
        break;
    }
}

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

sc.close();
}
```



```
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Date: 28/03/2023
Course code: 20MCA132

Enter the number of rows and columns of the matrix:
2
2
Enter 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.

```
public class CPU {

    private double price;

    public CPU(double price) {

        this.price = price;

    }

}
```

```
class Processor {

    private int cores;

    private String manufacturer;

    public Processor(int cores, String manufacturer) {

        this.cores = cores;

        this.manufacturer = manufacturer;

    }

    public void displayInfo() {

        System.out.println("Processor Cores: " + cores);

        System.out.println("Processor Manufacturer: " + manufacturer);

    }

}

// Static nested class RAM

static class RAM {

    private int memory;

    private String manufacturer;
```

```
public RAM(int memory, String manufacturer) {  
  
    this.memory = memory;  
  
    this.manufacturer = manufacturer;  
  
}  
  
public void displayInfo() {  
  
    System.out.println("RAM Memory: " + memory);  
  
    System.out.println("RAM Manufacturer: " + manufacturer);  
  
}  
  
}  
  
public static void main(String[] args) {  
  
    System.out.println("Name: Ashish P S");  
  
    System.out.println("Reg. No: SJC22MCA-2015");  
  
    System.out.println("Date: 28/03/2023");  
  
    System.out.println("Course code: 20MCA132");  
  
    System.out.println();  
}
```

```
CPU cpu = new CPU(500.0);

CPU.Processor processor = cpu.new Processor(4, "Intel");

CPU.RAM ram = new CPU.RAM(8, "Kingston");

System.out.println("CPU Price: " + cpu.price);

System.out.println("Processor Info:");

processor.displayInfo();

System.out.println("RAM Info:");

ram.displayInfo();

    }
}
```

```
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Course code: 20MCA132
```

```
CPU Price: 500.0  
Processor Info:  
Processor Cores: 4  
Processor Manufacturer: Intel  
RAM Info:  
RAM Memory: 8  
RAM Manufacturer: Kingston
```