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.

```java
import java.util.Scanner;
public class add_matrix {
        public static void main(String args[])
        {
        int row, col,i,j;
        Scanner in = new Scanner(System.in);
        System.out.println("Name: Athul Ajay");
        System.out.println("Reg No: SJC22MCA-017");
        System.out.println("Date: 28/03/2023");
        System.out.println("Course code: 20MCA132");
        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();
}


}
}
```

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

```
import java.util.Scanner;
public class add_matrix {
    public static void main(String args[])
    {
    int row, col,i,j;
    Scanner in = new Scanner(System.in);
    System.out.println("Name: Athul Ajay");
    System.out.println("Reg No: SJC22MCA-017");
    System.out.println("Date: 28/03/2023");
```

```java
System.out.println("Course code: 20MCA132");
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();
}

}
}
```

```
sjcet@Z238-UL:~/Athul/Java/C1$ javac add_matrix.java
sjcet@Z238-UL:~/Athul/Java/C1$ java add_matrix
Name: Athul Ajay
Reg No: SJC22MCA-017
Date: 28/03/2023
Course code: 20MCA132
Enter the number of rows
2
Enter the number columns
2
Enter the elements of matrix 1
1
2

3
4

Enter the elements of matrix 2
5
6

7
8

Sum of matrices:-
6       8
10      12
sjcet@Z238-UL:~/Athul/Java/C1$
```

3. Add complex numbers

```java
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 ){
```

```java
        r1=r1+r2;
        i1=i1+i2;
        System.out.println("After Addition = "+r1+"+"+i1+"i");
    }
    public static void main(String[] args) {
        // Scanner sc =new Scanner(System.in);
        // String firstComplex=sc.nextLine();
        // String[] ar=firstComplex.split("[-+i]");
        // String secondComplex=sc.nextLine();
        // String[] ar2=secondComplex.split("[-+i]");
        complex first=new complex(18,36);
        complex second=new complex(43,50);
        System.out.println("Name: Athul Ajay");
          System.out.println("Reg No: SJC22MCA-017");
          System.out.println("Date: 28/03/2023");
          System.out.println("Course code: 20MCA132");
        System.out.println("Complex Numbers are:");
        first.display();
        second.display();
        add(first.r,first.i,second.r,second.i);
    }

}
```



```
sjcet@Z238-UL:~/Athul/Java/C1$ javac complex.java
sjcet@Z238-UL:~/Athul/Java/C1$ java complex
Name: Athul Ajay
Reg No: SJC22MCA-017
Date: 28/03/2023
Course code: 20MCA132
Complex Numbers are:
18+36i
43+50i
After Addition = 61+86i
sjcet@Z238-UL:~/Athul/Java/C1$
```

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

```java
import java.util.Scanner;
public class symmetric {
public static void main(String[] args) {
    Scanner sc = new Scanner(System.in);
System.out.println("Name: Athul Ajay");
System.out.println("Reg No: SJC22MCA-017");
System.out.println("Date: 28/03/2023");
System.out.println("Course code: 20MCA132");
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");
```

```
}
}
}
```

```
sjcet@Z238-UL:~/Athul/Java/C1$ javac symmetric.java
sjcet@Z238-UL:~/Athul/Java/C1$ java symmetric
Name: Athul Ajay
Reg No: SJC22MCA-017
Date: 28/03/2023
Course code: 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)
1
Enter the Element at M(1,0)
2
Enter the Element at M(1,1)
2
Matrix is Antisymmetric
sjcet@Z238-UL:~/Athul/Java/C1$
```

```
sjcet@Z238-UL:~/Athul/Java/C1$ java symmetric
Name: Athul Ajay
Reg No: SJC22MCA-017
Date: 28/03/2023
Course code: 20MCA132
Enter the Number of rows of the Matrix
3
Enter the Number of Columns of the Matrix
3
Enter the Element at M(0,0)
1
Enter the Element at M(0,1)
1
Enter the Element at M(0,2)
-1
Enter the Element at M(1,0)
1
Enter the Element at M(1,1)
2
Enter the Element at M(1,2)
0
Enter the Element at M(2,0)
-1
Enter the Element at M(2,1)
0
Enter the Element at M(2,2)
5
Matrix is Symmetric
sjcet@Z238-UL:~/Athul/Java/C1$
```

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{
    int price;
     class processor{
        int cores;
        String producer;
        processor(int noC, String manu){
```

```java
            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("Name: Athul Ajay");
          System.out.println("Reg No: SJC22MCA-017");
          System.out.println("Date: 28/03/2023");
          System.out.println("Course code: 20MCA132");
        System.out.println("\nRAM info");
        System.out.println("Memory = "+mem+" GB");
        System.out.println("Manufacturer = "+manuf+"\n");
    }}
    public static void main(String[] args) {
        cpu.ram obj1= new cpu.ram(64,"HyperX");
        cpu obj2 = new cpu();
        cpu.processor obj3 = obj2.new processor(16,"AMD");
        obj1.display();
        obj3.display();

    }
}
```

```
sjcet@Z238-UL:~/Athul/Java/C1$ javac cpu.java
sjcet@Z238-UL:~/Athul/Java/C1$ java cpu
Name: Athul Ajay
Reg No: SJC22MCA-017
Date: 28/03/2023
Course code: 20MCA132

RAM info
Memory = 64 GB
Manufacturer = HyperX


Processor info
No. of Cores = 16
Manufacturer = AMD

sjcet@Z238-UL:~/Athul/Java/C1$
```