Object-oriented programming

(Classes, objetcs, constructors)

SOLUTION

Exercise 01 :

In the same main file :

```
class Point{
   private char nom;
   private double abs;
   public Point (char c, double x){
   nom=c;
   abs=x;}
   public void affiche()
   {
   System.out.println("The "+nom+" Point with abscissa= "+abs);}
  public void translate(double dx) {
     abs+=dx;
  }
}
public class YourProject {

   public static void main(String[] args) {
      Point a =new Point('c',2.5);
      a.affiche();
      a.translate(7);
      a.affiche();
}
```

Exercise 02 :

Main :

```
class Distance {
   public double x;
   public double y;
   Distance(double x, double y)
   {
      this.x = x;
      this.y = y;
   }

   public double getX()
   {
      return x;
   }

   public double getY()
   {
      return y;
   }

   public double distanceCalcule(Distance p)
   {
      double px = this.x - p.x;
      double py = this.y - p.y;

      return Math.sqrt(Math.pow(px,2)+ py * py);
   }
}
public class YourProject {
```

```
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);
        Distance p1 = new Distance(5, 6);
      Distance p2 = new Distance(3, 2);

      System.out.println("P1 ("+ p1.x +","+ p1.y +")");
      System.out.println("P2 ("+ p2.x +","+ p2.y +")");
      System.out.println("The distance between P1 and P2 is : "+p1.distanceCalcule(p2));
}
```

Exercise 03 :

Main :

```
public class MyCircle {
  public static void main(String[] args) {
   Cercle c1=new Cercle();
   System.out.println("The surface of the circle that has rayon  :"+c1.rayon+ " is "+c1.getSurface());
  //calculate the surface of the circle with rayon=25
  Circle c2=new Circle(25);
   System.out.println("The surface of the circle that has rayon  :"+c2.rayon+ " is "+c2.getSurface());
   //calculate the surface of the circle with rayon=125
   Cercle c3=new Cercle(125);
   System.out.println("The surface of the circle that has rayon  :"+c3.rayon+ " is "+c3.getSurface());
   // Modify the rayon of the second object
   c2. rayon = 100; // ou c2.setRayon (100 )
   System.out.println("The Perimeter of the circle that has rayon = "+ c2. rayon + "is"
 +c2.getPerimetre()) ;
}
}
```

Class :

```
public class Circle {
    double rayon ;
```

```
/** constructor with raduis=1 */
   Circle(){
   rayon = 1 ;
  }

/** Constructor with parameter **/
Circle( double nR) {
rayon = nR;
}

/** return the surface of the circle**/
double getSurface( ) {
return Math.pow(rayon, 2)* Math.PI ; //rayon*rayon
}

/** Return the perimetre of the circle **/
double getPerimetre( ) {
return 2 * rayon * Math.PI ; // Math.pow(rayon,2)

}

/** Give the radius new value **/
void setRayon( double nR) {
rayon = nR;
}
}
```

Exercise 04 :

Main :

```
import java.util.Scanner;

public class Matrice{

public static void main (String[] args) {

      Scanner scanner = new Scanner(System.in);
      System.out.print("Enter the number of rows: ");
      int rows = scanner.nextInt();
      System.out.print("Enter the number of columns: ");
      int cols = scanner.nextInt();
      Test m = new Test(rows, cols);
      m.Read_mat();
      m.Write_mat();

}

}
```

Class :

```
import java.util.Scanner;

public class Test {

  int[][] tab; //int tab[][] = {{0,0,0},{0,0,0}};  int [][] tab = new int [2][3];

   Scanner in = new Scanner(System.in);

  // constructor that takes rows and cols as parameters

   Test(int rows, int cols) {

  tab = new int[rows][cols];

   }

// methods

public void Read_mat(){ // read the matrix ********************************

 for(int i = 0; i < tab.length; i++)

      for(int j = 0; j < tab[0].length; j++) {

System.out.print("tab [ " + i + ", " + j + " ] = ");

tab[i][j]=in.nextInt();

System.out.print(" ");

}

}

public void Write_mat(){ // write the matrix ***************************
```

```
 for(int i = 0; i < tab.length; i++)
  for(int j = 0; j < tab[0].length; j++)
   System.out.println("tab [ " + i + ", " + j + " ] = " + tab[i][j]);
   }
public double  Sum_mat(){
    double som=0;
    for(int i = 0; i < 2; i++)
      for(int j = 0; j < 3; j++)
          som=tab[i][j]+som ;
          return som;
}
public double Max_mat(){
    double max=tab[0][0];
    for(int i = 0; i < 2; i++)
      for(int j = 0; j < 3; j++)
          if (tab[i][j]>max)
          { max=tab[i][j];
          }

    return max ;
}

}
```

Exercise 05 :

```
public class Tv {
    int channel=1; //channel by default is 1
    int volume=1;
    boolean on=false;

    public Tv(){}
```

```
public void turnOn(){
   on=true;
}

public void turnOff(){
on=false;
}

public void setChanel(int nCh){
   if(on && nCh >= 1 && nCh <= 120)
      channel=nCh;
}
 public void setVolume(int nVol){
   if(on && nVol >= 1 && nVol <= 7)
      volume=nVol;
}
public void chanSup()
{
   if(on && channel <120)
      channel++;
}

  public void chanInf()
{
   if(on && channel >1)
      channel--;
}

public void volumeSup()
{
```

```
    if(on && volume < 7)
        volume++;
  }

  public void volumeInf()
  {
    if(on && volume >1)
        volume--;
  }
```

Main

```
public static void main(String[] args) {
Tv tv1= new Tv();
    tv1.turnOff();
    tv1.setChanel(30);
    tv1.setVolume(3);
    Tv tv2= new Tv();
    tv2.turnOn();
    tv2.chanSup();
    tv2.chanSup();
    tv2.chanSup();
    tv2.volumeSup();
    System.out.println("tv1 is setted in the channel"+tv1.channel+" and its volume is"+ tv1.volume);
    System.out.println("tv2 is setted in the channel"+tv2.channel+" and its volume is"+ tv2.volume);
}
```

Exercise 06 :

Main :

```
public static void main(String[] args) {
    String name;
    int num = 0;
// Prompt the candidate to enter their name and a number
```

```
        Scanner sc = new Scanner(System.in);
        System.out.println("\nEnter your name: ");
        name = sc.next();
        System.out.println("\nEnter the quiz number: ");
        num = sc.nextInt();
        Quiz Q = new Quiz(name, num);
        Q.calculScore();
    }

public class Quiz {
    String nom;
    int val;

    //constructor
Quiz(String nom, int val){
this.nom=nom;
this.val=val;}

void calculScore(){
    int score =0;
    Scanner sc = new Scanner (System.in);
    for(int i=1; i<=10; i++){
    System.out.print(i+ "X" + val +"=");
    int inputCandidat= sc.nextInt();
    int res= i*val;

    if(res==inputCandidat){
        System.out.print("Correct!\n ");
        score++;
    }else{
    System.out.print("False!\n");
```

```
    }
    }

    System.out.println(nom + "!" + "Your score is :" + score + "/10 \n \n");
}

}
```