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 3rd year I.S. license   **Dr. Kouah Sofia**

Tutorial 1

Exercise 1: Consider the following class:

```java
class Rectangle {
int longueur ;
int largeur ;
int origine_x ;
int origine_y ;

    void methode1(int x, int y) {
    this.origine_x = this.origine_x + x ;
    this.origine_y = this.origine_y + y ;     }

    int methode2() {
    return this.longueur * this.largeur ; }
}
```

1. Can this class be executed? if not what is the reason?
2. Define two types of constructors for this class.
3. Create three instances by applying these constructors.
4. Create an array of 5 rectangles.
5. What function does this program serve?
6. Apply the class's methods on these instances while displaying their results. What are they doing?
7. Define a display method to display the width and length of the rectangle.
8. Create a square class inheriting from the Rectangle class.

Exercise 2: Consider the following class:

```java
import java.util.*;
public class Complex{
  double real, img;
 Complex(double r, double i){
    this.real = r;
    this.img = i;          }

  public static Complex methode(Complex c1, Complex c2)
  {   Complex c = new Complex(0, 0);
    c.real = c1.real + c2.real;
    c.img = c1.img + c2.img;
    return c;    }
   public static void main(String args[]) {    Scanner in = new Scanner(System.in);
       System.out.println("Premier nombre");
    System.out.println("Entrez la partie réelle: ");
    double r1 = in.nextDouble();
    System.out.println("Entrez la partie imaginaire: ");
    double i1 = in.nextDouble();
    Complex c1 = new Complex(r1, i1);
    System.out.println("Deuxième nombre");
    System.out.println("Entrez la partie réelle: ");
    double r2 = in.nextDouble();
    System.out.println("Entrez la partie imaginaire: ");
    double i2 = in.nextDouble();
    Complex c2 = new Complex(r2, i2);
    Complex c = methode(c1, c2);
       System.out.printf("La somme est: "+ c.real+" + "+ c.img +"i");       }    }
```

Questions:

1. What function does this program serve?
2. Comment out each line of the provided code.

Exercise 3:
Consider the following classes:

```
class Livre {
protected string titre, auteur, proprietaire ;
protected int nb_page ;
double prix ;
  public Livre(String t, String a, double p, int nb){
 titre = t ; auteur = a ;
 prix = p ; proprietaire = "" ;
 nb_page = nb ;    }
public void Afficher() {
 System.out.println("Titre : " + titre) ;
 System.out.println("Auteur : " + auteur) ;
 System.out.println("Prix : " + prix) ;
 System.out.println("Nombre de pages : " + nb_page);
 if ( this.Est_neuf() ) {
 System.out.println("Aucune proprietaire" ) ;
 } else {
 System.out.println("Proprietaire: "+proprietaire);     }
 System.out.println() ;      }
public boolean Est_neuf() {
 if ( proprietaire =="" ) return true ;
 else return false ;      }
public void Acheter(String nom) {
 proprietaire = nom ;       }
}
class BD extend Livre {
private boolean encouleur ;
public BD(String t,String a,double p,int nb, boolean c){
 super(t,a,p,nb) ;
 encouleur = c ;
 }
}

class Album extends Livre {
boolean page_coloriee[];
public Album(String t, String a, double p, int n){
 super(t,a,p,n) ;
 page_coloriee = new boolean[n];
 int i ;
 for (i=0 ; i<100 ; i++)
 page_coloriee[i] = false ;
 }
public void Colorie(int num_page){
 if((page_coloriee[num_page] == false) && !Est_neuf()){
 page_coloriee[num_page] = true ;
 } else {
 System.out.println("page deja coloriee" ) ;
 }
 }
}
```

```java
public class Test {
public static void main(String[] args) {
 Livre l1 = new Livre("Le petit prince","StExupéry",10.40, 50) ;
 Livre l2 = new Livre("Contes","Grimm",14.40,254) ;
 l1.Afficher() ;
 l1.acheter("moi") ;
 l1.Afficher() ;
 l1.prix = 0.0 ;
 l2.Acheter("lui") ;
 l2.Afficher();

 BD b1 = new BD("Lucky Luke","Morris",10.40, 45, true);
 BD b2 = new BD("Tintin","Herge",200.40, 45, false) ;
 b1.Acheter("moi");
 b1.Afficher() ;
 b2.Afficher() ;

 Album a1 = new Album("Dora","Dora", 300, 3.5) ;
 a1.Afficher() ;
 a1.Colorie(23) ;
 a1.Acheter("moi");
 a1.Colorie(23) ;
 }
}
```

Questions:

1. What function does this program serve?
2. Explain the use of extends and its benefit.