Laboratoire 3 – Programmation orientée objet
ITI 1521. Introduction à l'informatique II – Hiver 2021
SOLUTION
/10

Question 1 : (3 POINTS)

```
/**********************code Use.java **********************/
public class Use {
   public static String[] replace( String[] tabIn, String[] tab, String[] tabOut ) {
      String[] out = null; // Le nouveau tableau à renvoyer
      boolean ok = true; // True si les pre-conditions sont satisfaites

         // Tester les pre-conditions
         if (tabIn == null || tab == null || tabOut == null ) {
            ok = false;
         }
         else {
            for ( int i=0; ok == true && i<tabIn.length; i++ ) {
              if ( tabIn[ i ] == null ) {
                ok = false;
              }
             }
            if ( ok ) {
              if ( tab.length != tabOut.length ) {
                ok = false;
              }
              else {
             for ( int i=0; ok == true && i<tab.length; i++ ) {
               if ( tab[ i ] == null || tabOut[ i ] == null ) {
                 ok = false;
               }
             }
           }
         }
         }

         if ( ok ) {
            out = new String[tabIn.length];
            for ( int i=0; i<tabIn.length; i++ ) {
            boolean found = false;
            for ( int j=0; ! found && j<tab.length; j++ ) {
             if ( tabIn[ i ].equals( tab[ j ] ) ) {
               out[ i ] = tabOut[ j ];
               found = true;
             }
            }
            if ( ! found ) {
             out[ i ] = tabIn[ i ];
            }
          }
         }
              return out;
           }}
```

```
/******************Exemple de code Test ***********/
public class TestUse {
   public static void main(String[] args) {
   String [] tabIn = new String[]{"Book","off","I"};
   String [] tab = new String[]{"Java","C++","off"};
   String [] tabOut = new String[]{"Id","Name","my"};
   String [] out = new String [tabIn.length];
    out = Use.replace(tabIn, tab, tabOut );
    System.out.print ( " les elements du tableau renvoye par replace sont : " ) ;
   for (int i =0; i<out.length ; i++) {
   if ( i >0) {
  System.out.print ( " , " ) ;
  }
 System.out.print (out [ i ] ) ;
 }
   System.out.println();
  }
}
```

Question 2 : (3 POINTS)

```
/**********************code Book.java**********************/
        public class Book {
          // Variables
          private String title, author;
          private double price = -1.0;
          private boolean fixedPrice = false;

          // Constructeurs
          public Book(String a, String t) {
            this(a,t,0.0);
          }

          public Book(String a, String t, double p) {
            author = a;
            title = t;
            setPrice(price);     // l'appel au modificateur est plus sur
          }

          // Accesseurs
          public String getAuthor() {
            return author;
          }

        public String getTitle() {
            return title;
          }

        public double getPrice() {
            return price;
          }
```

```
  public boolean isfixedPrice() {
    return fixedPrice ;
  }


// Modificateurs
  public void setAuthor(String sA) {
    author = sA;
  }

  public void setTitle(String sT) {
    title = sT;
  }

public void setPrice(double p) {
    if (fixedPrice ) {
      System.err.println("Price is fixed !");
    }
    else if (p >= 0.0) {
      price = p;
      fixedPrice = true;
    }
    else {
      System.err.println("Error : negative price !");
    }
  }

 public void affiche() {
    System.out.print(toString());
  }

  public String toString() {
    return "Book[title=" + title + ", author=" + author + ", fixedPrice = " + fixedPrice
+ ", price = $" + price + "]";
  }
}

/**********************code TestBook.java**********************/
public class TestBook {
   public static void main(String[] args) {
    Book book1 = new Book("E.B.Koffman ", "Abstraction and Design Using Java");
    Book book2 = new Book("Duane A.Bailey", " Data Structures in Java for Principled
                                  Programmer ");
    book1.setPrice(100.0);
    System.out.println(book1);
    book2.setPrice(120.0);
    book2.affiche();
    System.out.println();
  }
}
```

Question 3 : (2 POINTS)

```
/**********************code Accountant .java**********************/
public class Accountant  {
  private double totalPrice = 0.0;
  public double getTotalPrice() {
    return totalPrice;
  }

  public void count(Book b){
    totalPrice += b.getPrice();
  }
}

/**********************code Book.java**********************/
public class Book {
  // Variables
  private String title, author;
  private double price = -1.0;
  private boolean fixedPrice = false;

  // Constructeurs
  public Book(String a, String t) {
    this(a,t,0.0);
  }

  public Book(String a, String t, double p) {
    author = a;
    title = t;
    setPrice(p);     // l'appel au modificateur est plus sûr
  }

  // Accesseurs
  public String getAuthor() {
    return author;
  }

public String getTitle() {
    return title;
  }

public double getPrice() {
    return price;
  }

// Pas de methode setfixedPrice
  public boolean isfixedPrice() {
    return fixedPrice ;
  }
```

```
// Modificateurs
  public void setAuthor(String sA) {
    author = sA;
  }

  public void setTitle(String sT) {
    title = sT;
  }

public void setPrice(double p) {
    if (fixedPrice ) {
      System.err.println("Price is fixed !");
    }
    else if (p >= 0.0) {
      price = p;
      fixedPrice = true;
    }
    else {
      System.err.println("Error : negative price !");
    }
  }

 public void affiche() {
    System.out.print(toString());
  }

  public String toString() {
    return "Book[title=" + title + ", author=" + author + ", fixedPrice = " + fixedPrice
+ ", price = $" + price + "]";
  }
}

/**********************code TestBook.java**********************/
public class TestBook {
   public static void main(String[] args) {
    Book book1 = new Book("E.B.Koffman ", "Abstraction and Design Using Java");
    Book book2 = new Book("Duane A.Bailey", " Data Structures in Java for Principled
    Programmer ", 120);
    Book book3 = new Book("Pattern in Java", "Mark Grand", 250.0);
    book1.setPrice(100.0);
    System.out.println(book1);
    System.out.println(book2);
    System.out.println(book3);

    // Creer 2 objets Accountant
    Accountant account1 = new Accountant();
    Accountant account2 = new Accountant();

    // Comptabilise certains livres
    account1.count(book1 );
```

```
    account1.count(book2 );
    account2.count(book3 );

    // Affiche le prix total
    System.out.print("total book prices recorded by the 1st accountant is : $ ");
    System.out.println(account1.getTotalPrice());
    System.out.print("total book prices recorded by the second accountant is : $ ");
    System.out.println(account2.getTotalPrice());
  }
}
```

Question 4 : (2 POINTS)

```
/**********************code Accountant.java**********************/
public class Accountant  {
  private double totalPrice = 0.0;

  public double getTotalPrice() {
    return totalPrice;
  }

  public void count(Book b){
    totalPrice += b.getPrice();
  }
}
```

```
/**********************code Book.java**********************/
public class Book {
  // Variables
  private String title, author;
  private double price ;
  private boolean fixedPrice = false;
// Le meme Accountant pour tous les livres (static)
  private static Accountant accountant = new Accountant();

  // Constructeurs
  public Book(String a, String t) {
    author = a;
    title = t;
  }

  public Book(String a, String t, double p) {
    author = a;
    title = t;
    setPrice(p);
  }

  // Accesseurs
  public String getAuthor() {
    return author;
  }
```

```
public String getTitle() {
    return title;
  }

public double getPrice() {
    return price;
  }


// Modificateurs
  public void setAuthor(String sA) {
    author = sA;
  }

  public void setTitle(String sT) {
    title = sT;
  }

public void setPrice(double p) {
    if (fixedPrice ) {
      System.err.println("Price is fixed !");
    }
    else if (p >= 0.0) {
      price = p;
      fixedPrice = true;
      accountant.count(this);
    }
    else {
      System.err.println("Error : negative price !");
    }
  }

public static double getTotalPrice() {
    return accountant.getTotalPrice();
  }

 public void affiche() {
    System.out.print(toString());
  }

  public String toString() {
    return "Book[title=" + title + ", author=" + author + ", fixedPrice = " + fixedPrice
+ ", price = $" + price + "]";
  }

}
```

```
/**********************code TestBook.java**********************/
public class TestBook {
  public static void main(String[] args) {
   Book book1 = new Book("E.B.Koffman ", "Abstraction and Design Using Java");
   Book book2 = new Book("Duane A.Bailey", " Data Structures in Java for Principled
                  Programmer ", 120);
   Book book3 = new Book("Pattern in Java", "Mark Grand", 250.0);
   book1.setPrice(100.0);
   System.out.println(book1);
   System.out.println(book2);
   System.out.println(book3);

   // Affiche le prix total
   System.out.print("total book prices recorded by the accountant is : $ ");
   System.out.println(Book.getTotalPrice());
  }
}
```