ITSE 2417 (DL)- Fall 2016
Quiz 3- Chapters 14-19
Total Points: 50

Due: Monday, November 21st @ 11:59PM. Look at Syllabus/ICR on late work.

Directions: For Questions 1-17, clearly mark answers on a separate word (or notepad) document. See sample file/directions provided by your professor and submit to the appropriate location on the MyTCC (BlackBoard) site.

– Assume all variables are properly declared- unless otherwise mentioned.

Multiple Choice. Mark the one best answer for each question. **(2 pts. each)**

1. The main function of the `DataOutputStream` class is to connect
   A. a binary output stream to a file
   B. a program to a binary output stream
   C. a binary output stream to a character output stream
   D. a program to a file

2. Which of the following statements is not true?
   A. With a random access file, you can read data from any location in the file.
   B. With a random access file, you can write data to any location in the file.
   C. You can synchronize random access files to allow only one user at a time to update the file.
   D. To read the 50th record in a random access file, you must first read records 1 through 49.

3. Which method moves the file pointer in a `RandomAccessFile`?
   A. `seek`
   B. `length`
   C. `getFilePointer`
   D. `close`

4. Let `Point<T>` be a generic type. We want to write a method that takes as parameter `Point` objects whose type parameter is the `Number` class, or any subclass of `Number`. We can do this by declaring the type of the method parameter as
   A. `Point<Number>`
   B. `Point<? super Number>`
   C. `Point<? extends Number>`
   D. `Point<? sub Number>`

5. A class is generic
   A. if it is a subclass of the `Object` class
   B. if it is a superclass of the `Object` class
   C. if it has type parameters
   D. if it has method parameters

6. The purpose of the `start()` method of the JavaFX Application class is
   A. to begin execution of the application by calling the `main()` method.
   B. to assemble the user interfaced onto a stage, attach event handlers, and show the stage.
   C. All of the above.
   D. None of the above.

7. What is the output of the following JavaFX program?

```
import javafx.application.Application;
import javafx.stage.Stage;

public class Test extends Application {
  public Test() {
    System.out.println("Test constructor is invoked.");
  }

  @Override // Override the start method in the Application class
  public void start(Stage primaryStage) {
    System.out.println("start method is invoked.");
  }

  public static void main(String[] args) {
    System.out.println("launch application.");
    Application.launch(args);
  }
}
```

A. `launch application. start method is invoked.`
B. `start method is invoked. Test constructor is invoked.`
C. `Test constructor is invoked. start method is invoked.`
D. `launch application. Test constructor is invoked. start method is invoked.`

8. Which of the following statements are true?
   A. An anonymous inner class is an inner class without a name.
   B. An anonymous inner class must always extend a superclass or implement an interface, but it cannot have an explicit extends or implements clause.
   C. An anonymous inner class is compiled into a class named `OuterClassName$n.class`.
   D. All of the above

9. To set the node to the right of the text in a label `lbl`, use _____.
   A. `lbl.setContentDisplay(ContentDisplay.TOP);`
   B. `lbl.setContentDisplay(ContentDisplay.RIGHT);`
   C. `lbl.setContentDisplay(ContentDisplay.BOTTOM);`
   D. `lbl.setContentDisplay(ContentDisplay.LEFT);`

10. Which of the following statements declares a generic class named `GenericList`?
    A. `public generic class GenericList{}`
    B. `public class<E> GenericList{}`
    C. `public class GenericList<E>{}`
    D. `public class generic GenericList{}`

11. What class do all `Swing` applets inherit?
    A. `javax.swing.Applet`
    B. `javax.swing.JApplet`
    C. `java.applet.JApplet`
    D. `java.awt.Applet`

12. What does the code that follows write to the `s.dat` file?

```
RandomAccessFile r = new RandomAccessFile("s.dat", "rw");
String s = "word";
for (int i = 0; i < 10; i++)
{
    if (i < s.length())
        r.writeChar(s.charAt(i));
    else
        r.writeChar(0);
}
```

A. `"word"`
B. `"word"` followed by 6 Unicode zeros
C. `"word"` followed by 10 Unicode zeros
D. `"word"` followed by 6 spaces

13. Consider the following method:

```
public static void shifter(String s)
{
   if(s.length() < 4)
      System.out.println();
   else
   {
      System.out.print(s.charAt(2));
      shifter(s.substring(2));
   }
}
```

What will be printed as a result of `shifter("Computer Science");`?

A. `Computer`
B. `optrSine`
C. `mue cec`
D. `Computer Science`

14. What are the base cases in the following recursive method?

```
public static void xMethod(int n) {
  if (n > 0) {
    System.out.print(n % 10);
    xMethod(n / 10);
  }
}
```

A. `n > 0`
B. `n <= 0`
C. no base cases
D. `n < 0`

15. A JavaFX action event handler contains a method _____.

A. `public void actionPerformed(ActionEvent e)`
B. `public void actionPerformed(Event e)`
C. `public void handle(ActionEvent e)`
D. `public void handle(Event e)`

Short Answer. Clearly mark answers as directed. Partial Credit will be given. **(10 @ 2 each)**

16. Which of the following lines of code are valid declarations of generic methods? Mark valid/invalid.

A. `void print<T>(T x) { System.out.println(x); }`

B. `static <T> void print(T x) { System.out.println(x); }`

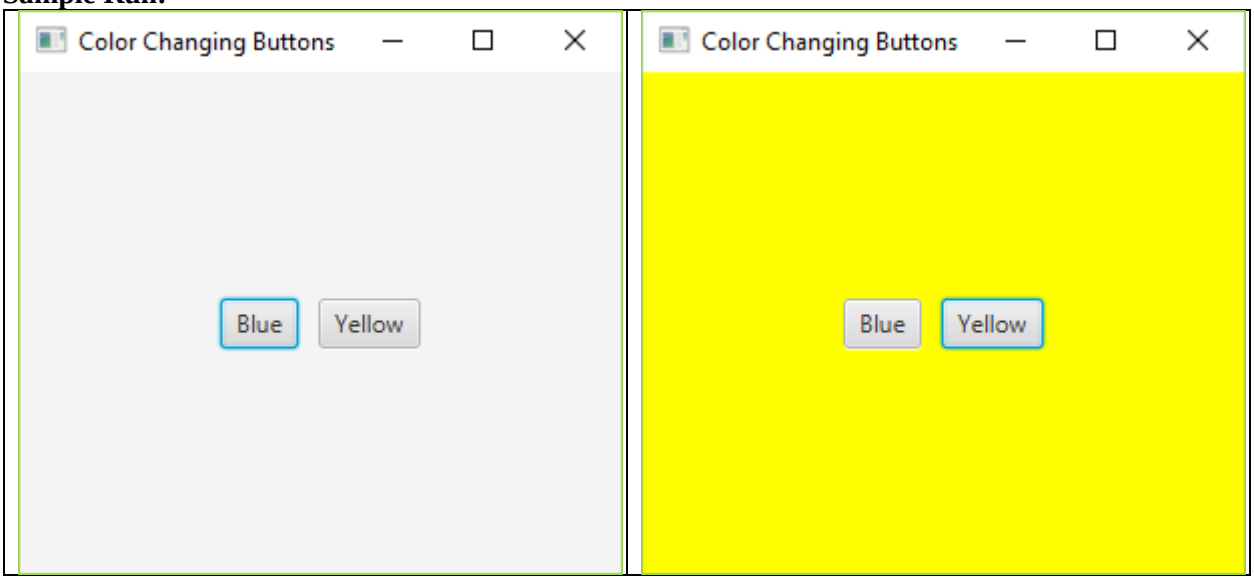
C. `<?> void print(Object x){ System.out.println(x); }`

D. `<T extends Object> void print(T x) { System.out.println(x); }`

E. `<T> T getT(T t) { return null; }`

17. Write a Java FX program that displays two buttons in a horizontal box. The first button should be labeled `Blue` while the second is labeled `Yellow`. Clicking the `Blue` button changes the background color of the horizontal box to blue, while clicking on the `Yellow` button changes the color of the horizontal box to yellow.

Sample Run:



Fill in the missing parts of the program below to solve the problem as stated above. Do not add any additional lines of code. **(10 @ 2 each)**

```
//ColorChangingButtons.java

import javafx.event.ActionEvent;
import javafx.event.EventHandler;
import javafx.geometry.Insets;
import javafx.geometry.Pos;
import javafx.scene.Scene;
import javafx.scene.control.Button;
import javafx.scene.layout.HBox;
import javafx.stage.Stage;

public class ColorChangingButtons extends Application
{
    @Override
    public void start(Stage primaryStage)
    {
        // Create the Buttons
        Button blueButton = new Button("Blue");
        ____________________________________                                    //1

        // Create the Horizontal box and add the buttons
        HBox hBox = new HBox(10);
        hBox.setPadding(new Insets(10));
        hBox.setAlignment(Pos.CENTER);
        hBox.getChildren().addAll(blueButton, yellowButton);

        // Create the Color changing event handler

        ____________________________________                                    //2
        {
           Button target = (Button)e.getTarget();

           // Set up a CSS style for the color determined by the target button
           StringBuilder cssColor = new StringBuilder("-fx-background-color: ");
           if (target == yellowButton)
           {
              ____________________________________                              //3
           }
           else
           {
               cssColor.append("blue");
           }
           // set the background color for the horizonatal box using CSS
           hBox.setStyle(cssColor.toString());
        };

        // Set the event handler on the two buttons
        yellowButton.setOnAction(handler);
        ____________________________________                                    //4

        // Set up scene and show the stage
        Scene scene = new Scene(hBox, 300, 250);
```

```
        primaryStage.setTitle("Color Changing Buttons");
        primaryStage.setScene(scene);
        primaryStage.show();
    }

    public static void main(String[] args)
    {
        _____________________                                    //5
    }
}
```

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Extra Credit: Implement the following program. Follows same program guidelines and graded on the same scale as program sets. Submit only your `.java` file- no test runs required. Partial credit given. (**10 points)**

Write a Java application that interactively accepts double values and write them to a binary file called `data.bin`. The program then reads `data.bin` and reports the number of data as well as the average value of the data to the screen. Let the user choose the filename from the keyboard, and use a menu to let the choose to output to the file or read from the file. Output should be user friendly.

Name the program: `BinTester.java`, where `XX` are your initials.