Multiple-Choice Quiz

This section helps you review what you have learned.

1. In Java, the default layout manager for a JFrame component is
   (a) GridBagLayout
   (b) BorderLayout
   (c) GridLayout
   (d) FlowLayout
2. What is the number of regions into which the BorderLayout in Java subdivides a container?
   (a) 4
   (b) 8
   (c) 2
   (d) 5
3. Which of the following is (are) true regarding containers and components in the context of java GUI?
   A container can be added to a component.
   A component can be added to a container.
   A container can be added to another container.
   (a) I and III only
   (b) I, II, and III
   (c) I and II only
   (d) II and III only
4. What is the signature of the method specified in the Java ActionListener interface?
   (a) void actionListener (ActionEvent ae)
   (b) void actionEvent (ActionPerformed ap)
   (c) void actionPerformed (ActionEvent ae)
   (d) void actionPerformed (ActionListener al)
5. Which of the following is (are) true regarding event handling in Java?
   When a GUI component is created, the component automatically has the ability to generate events during user interaction.
   Each Listener object must be registered with the specific component object or objects for which the Listener object is to respond.
   (a) I only
   (b) II only
   (c) I and II
   (d) None
6. In which of the following ways can items be added to a collection implemented by java.util.ArrayList?
   Items can be inserted at the beginning of the collection.
   Items can be inserted between two existing items in the collection.
   Items can be appended to the end of the collection.
   (a) I, II, and III
   (b) I and III only
   (c) III only
   (d) I only

7. Consider the following Java program segment.
   ```
   PrintWriter fileOut = new PrintWriter(
       new FileWriter( "output.txt" ));
   ```
   If the file output.txt already exists, which of the following events will occur when the program segment is executed?
   (a) The existing contents of output.txt will be erased.
   (b) A run-time error will be generated.
   (c) The existing contents of output.txt will be preserved.
   (d) A FileAlreadyExists exception will be raised.
8. The subclass of an abstract class must
   (a) be abstract and implement all of the parent's abstract methods
   (b) be abstract
   (c) be abstract or implement all of the parent's abstract methods
   (d) implement all of the parent's abstract methods
9. What is the right way to handle abnormalities in input on Java?
   (a) By handling these problems by providing exception handlers
   (b) By using the class FileFilter which gracefully filters out bad input data
   (c) By always specifying the throws clause in every method header where file I/O is performed
   (d) By writing while loops to guard against bad input
10. Which of the following statements is (are) true in Java?
    I All of the methods in an abstract class must be abstract.
    II All of the methods in an interface must be abstract.
    (a) None
    (b) I only
    (c) II only
    (d) I and II

Using Java Collections

Background

This assignment asks you to implement a set of methods to process Java collections.

Description

In this assignment, you will finish the implementation of StudentArrayList, a class with methods for processing an ArrayList of Student objects. We provide a test driver and the Student class.

Student class

A complete implementation of this class is included in the student archive student_files.zip.

StudentArrayList class

A partial implementation of this class is included in the student archive student-files.zip. You should complete the implementation of each method.

TestStudentArrayList class

This class is a test driver for StudentArrayList class. It contains test cases for each method in the class. A complete implementation is included in the student archive student-files.zip. You should use this class to test your implementation of StudentArrayList class.

Tasks

Implements all methods in StudentArrayList class. Follow Sun's code conventions.

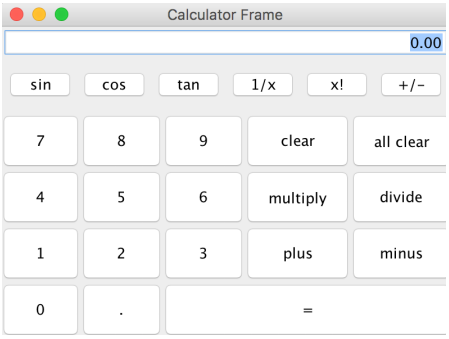
Simple GUI and Event Handling

Objectives:

- Let you get familiar with GUI programming using Swing components
- Discuss the GridBagLayout manager
- Let you get familiar with event handling (button event)

Swing Components

- **Calculator Frame**



We are going to implement a program called Calculator Frame. This program is almost a dummy graphical scientific calculator which will do **NOTHING** when a user presses the keys on the panels, except two buttons, the "7" and "all clear".

Task

1. Create a calculator frame which looks like the graph above. You may download the skeleton code here to start with, but you may also write your program of a calculator with the same look and functions.
2. The layout o the frame should also fulfill the following requirements:
   - There are 3 parts on the frame: the display, the scientific pad, and the numeric pad
   - The dimension of all buttons in scientific pad should be the same
   - The "=" button should span across three columns
   - The 3 parts of the calculator are always aligned vertically, and they should be separated 10 pixels away from each other
3. Event handling: After any of the buttons is clicked, the display should be updated accordingly. For the purpose of exercise, you are only required to handle two buttons: the digit "7" and "all clear". As a result, "7" should be displayed at the top whenever the button "7" is clicked, and "0.00" should be displayed whenever the button "all clear" is clicked.

Hint

You may want to use JTextField.setHorizontalAlignment(JTextField.RIGHT) to align the text in the display to the right.