Computer Science Department

MHC Mount Holyoke College

CS 215
Software Design
Homework 3
MVC
Due: September 29, 11:55 PM

Objectives

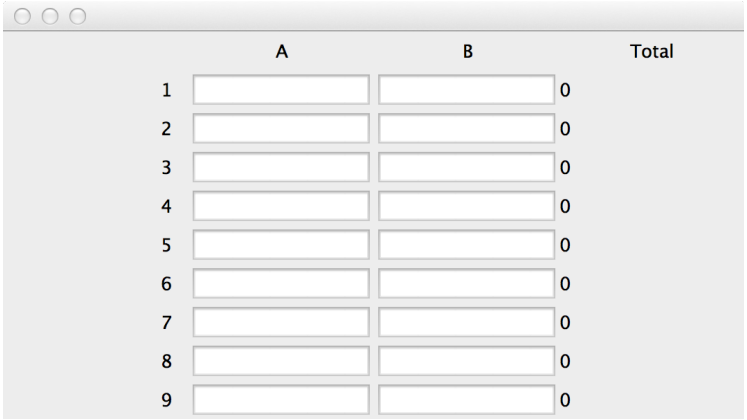
- To gain experience with the Model-View-Controller architecture

Assignment

A spreadsheet is a good example of a program that uses an MVC architecture. Some cells in a spreadsheet contain values, while other cells contain equations. When a cell that contains a value is changed, any equations that refer to that cell are re-evaluated and the new value is displayed. These equations can themselves be referenced in yet other equations, resulting in a cascade of re-evaluations when a cell is edited.

Furthermore, cells can be referenced in graphs with the graphs being automatically updated when a cell is edited.

(50 points) Code



For this assignment, you will use the MVC architecture to write an extremely simple spreadsheet. Your spreadsheet should look something like the figure at the right.

The columns labeled A & B are rows where the user can enter integers. The Total column should display the total of the two columns in that row. If a cell is blank, it should be treated as 0 when computing the total.

Think through the design before you begin coding. What is the model? the view? the controller? What classes do you need to represent these?

Please turn this in as a jar file, being sure to include the (well-documented) source code. (If you are using Eclipse, select the project, right-click and select Export, then Java, then JAR File. **You need to be sure to check the box that says "Export Java source files and resources" in the JAR Export window.**)

Write-up

1. (15 points) Draw a UML diagram showing the relationship between your classes. It is only necessary for you to include in the diagram the public methods of each class and the instance variables of each class. It is not necessary to show non-public methods or static variables or constants.

2. (15 points) In text, explain how your classes fill in the parts of the MVC architecture.

3. (10 points) How would you change your design if you wanted to allow the user to change what the third column does? For example, the user might choose between total, average, minimum or maximum as the function to display in the third column.

4. (10 points) How would you change your design if you wanted to allow the user to draw a bar graph of the values in the Total column, that is, drawing one bar for each value in the Total column? Focus on MVC issues, not details about how to draw the graph.