# Programming Concepts II – In-class Quiz 1

The way a calculator works is: you enter the “x” value, select an operator, enter the “y” value, and click “=”. It computes and displays the result in the textbox. This means it needs to remember the “x” value and the pending operator somewhere.

1. ~~Disable the textbox so only the number keys can enter operands~~.
2. You need 3 global variables:
   1. *~~x,~~* ~~which is the first operand (Double)~~
   2. *~~pendingAction~~*~~, the operator to be applied between~~ *~~x~~* ~~and the next number~~
   3. *newNumber*, which is true when “=” has put a result into the textbox, and false as soon as a digit is clicked.
3. When a digit or decimal point is clicked (these can all use the same event handler):
   1. ~~If~~ *~~newNumber~~* ~~is true, clear the textbox & equation label,~~~~set~~ *~~newNumber~~* ~~to false~~
   2. ~~Cast~~ *~~sender~~* ~~to a~~ *~~Button~~* ~~so you can append its~~ *~~Text~~* ~~to the textbox: ((Button)sender).Text~~
   3. ~~Ignore a second decimal place if the textbox already has one~~.
4. ~~The operator buttons move the textbox’s value to~~ *~~x,~~* ~~clears the textbox, and sets~~ *~~pendingAction~~* ~~to the operator displayed on the button. These can all use the same event handler.~~
5. ~~The “=” button’s event handler has a switch~~ or a compound if-else, ~~applying the~~ *~~pendingAction~~* ~~between x (in memory) and y (in the textbox).~~
   1. ~~The result is placed in the textbox & appended to the label,~~ *~~x~~* ~~is set to zero,~~ ~~pendingAction is cleared~~, ~~and~~ *~~newNumber~~* ~~is set to true.~~
6. ~~The “12+5=2.4” label above the textbox is obvious, right? The main question is not “how” … it’s “when” … when are operands and operators appended to it, and when is it cleared?~~
7. *~~C~~* ~~and~~ *~~CE~~* ~~both clear the textbox~~, ~~while~~ *~~CE~~* ~~also clears the label above the textbox~~, then ~~sets~~ *~~x~~* ~~to zero~~, *pendingAction* to “”, and *newNumber* to true.

Advanced:

* Will this to do a compound equation: “x”, operator, “y”, result … operator, “y”, result … operator, “y”, result?
* What about buttons for modulus (%), inversion (1/x), square root, change sign (+/-) or xy?

## Marking

1. ~~Digits are added to the textbox as keys are clicked~~
2. ~~Operator key clears the textbox, puts x and operator in the label~~
3. ~~Equal Key computes the correct result into the textbox.~~