The following questions will be considered during the tutorial sessions on Friday. I am expecting answers to the questions, and you should be prepared to demonstrate your programs on the PC in the tutorial.

**Q1 (RESEARCH):** The MVC (Model View Controller) programming pattern is an old software pattern, first described over 25 years ago, and first implemented in the language Smalltalk-80. This language had certain properties that encouraged the development of this sort of software pattern.

(a) what is the specific property of Smalltalk-80 that “encouraged the development of this sort of software pattern”?

(b) Swing uses a modified MVC architecture. What is the modification?

**Q2:** Write Tcl code that creates a new Tcl command structure - the `recurse x y until lessthan z` command. This command should execute the function `x` passing it a single parameter. The return value is tested to see if it is less than `z`. If yes, then the command returns the number of recursions done. If no, then it recurses again, using the previous return value as the new `y` value. For example - if we had a function `half` which returns its argument divided by two, then `recurse half 17 until lessthan 1` should return 5.

**Q3:** Modify the Tk application `tkpaint` (found at ~cs3283/ftp/tkpaint) to save and restore paintings.

**Q4:** Modify the Tk application `tkpaint` (found at ~cs3283/ftp/tkpaint) to use a menu system instead of the buttons