Assignment #2 – Minesweeper in Java

Date assigned: Monday, November 14, 2011
Date due: Tuesday, November 22, 2011 (by 3pm)
Points: 50

The game minesweeper is a single-player game with the object of clearing a minefield without detonating a mine. The purpose of this assignment is to write a complete Java version of minesweeper. The logic (and code) gained from this assignment will then be used to implement an Android version of minesweeper. Details of the game can be found at:
http://en.wikipedia.org/wiki/Minesweeper_(video_game).

Details of our Java game:

1. Set a constant to determine the dimension of our grid. Set the dimension to 9 initially giving us a grid of 9x9 or 81 squares.
2. Ask the user to input a difficulty level (EASY is 0, MEDIUM is 1, and HARD is 2)
3. Set the number of mines based on the difficulty level:
    a. EASY (specified by 0) is the dimension of our grid or 9.
    b. MEDIUM (specified by 1) is the dimension of our grid plus 1 times 3 which is 12.
    c. HARD (specified by 2) is the dimension of our grid plus 2 times 3 which is 15.
4. Some details of the game:
    a. Bombs are placed in random positions in the grid and identified with a value of -1.
    b. During a turn the user selects a cell to reveal the cell's contents
        i. A cell that has adjacent bombs is the only cell revealed and a number indicating the number of adjacent bombs is displayed in the cell the next time the grid is output.
        ii. A cell that has no adjacent bombs is marked with a 99. If a cell has no adjacent bombs, then all adjacent cells (including the diagonals) are looked at. For each of the adjacent cells, then either i. or ii. applies. Yes, this is a recursive definition although you do not need recursion to solve the problem.
        iii. A cell that has a bomb terminates the game

c. If all non-bomb cells are identified with a number other than zero before a cell with a bomb is selected, then the user wins; otherwise, a bomb was hit.

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***********
Minesweeper
***********

Enter difficulty level
(0 = EASY, 1 = MEDIUM, 2 = HARD): 0

  0  0  0  0  0  0  0  0  0
  0  0  0 -1  0  0 -1  0  0
  0  0  0  0  0  0  0  0  0
  0 -1  0  0 -1 -1  0  0  0
 -1  0  0  0  0 -1  0  0 -1
  0  0  0  0  0  0  0  0  0
  0  0  0  0  0  0  0  0  0
 -1  0  0  0  0  0  0  0  0
  0  0  0  0  0  0  0  0  0

Enter X and Y Coordinate: 0 0

 99 99  1  0  0  0  0  0  0
 99 99  1 -1  0  0 -1  0  0
  1  1  2  0  0  0  0  0  0
  0 -1  0  0 -1 -1  0  0  0
 -1  0  0  0  0 -1  0  0 -1
  0  0  0  0  0  0  0  0  0
  0  0  0  0  0  0  0  0  0
 -1  0  0  0  0  0  0  0  0
  0  0  0  0  0  0  0  0  0

Enter X and Y Coordinate: 3 0

 99 99  1  0  0  0  0  0  0
 99 99  1 -1  0  0 -1  0  0
  1  1  2  0  0  0  0  0  0
  2 -1  0  0 -1 -1  0  0  0
 -1  0  0  0  0 -1  0  0 -1
  0  0  0  0  0  0  0  0  0
  0  0  0  0  0  0  0  0  0
 -1  0  0  0  0  0  0  0  0
  0  0  0  0  0  0  0  0  0

Enter X and Y Coordinate: 4 0

Boooom!!! You lose.
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Goals for Assignment #2:

1.   Write a Java application using multiple classes
2.   Use packages to better organize all classes
3.   Use good OOP techniques in designing your solution
4.   Use the Java API which has a rich library of routines (e.g. Vector)
5.   Use JUnit framework for testing classes

Specifics:

1.   Save your Android project in a project folder called
PUNetMinesweeperJava. Then drop the entire folder into the **CS260-01
Drop** folder by 3:00pm on the day in which the assignment is due.

2.   Your code is to be written using the development tools specified in the
syllabus.

3.   If you come to me with a question regarding your solution, I will have
you load your project onto a machine in the CS lab. I will not look at your
code on your computer or on paper as it just takes me too long to get at the
problem. Further, I want you to bring in your lecture notes in case I want
you to look up something. Remember, I'm not just a tell you the answer
guy. Make sure you understand how to use the developer tools and that you
can run your program in Eclipse.

4.   If you want help with a compiler error, you must be able to tell me
exactly what statement you put in your code that caused the error and be
able to isolate the error. If you have typed in a bunch of code and have not
tested your code as you've gone along, I'm not going to help you sort out
the mess. You've been warned!!

5.   You are to print out each .java file fully documented using the Java
Coding Standards V1.0. You printout is due to me by 3pm on the day in
which the assignment is due.