Name: _____

Final Programming Assessment
CMP 230: Programming Methods I
Lehman College– CUNY
10 December 2009

Directions:
• **Include your name (as a comment) in your solution to each problem.**
• **Submit each solution on Blackboard, under "Final Programming Assessment" in Assignments.**

Problem 1a	5	
Problem 1b	10	
Problem 2a	5	
Problem 2b	10	
Problem 3a	10	
Problem 3b	10	
Total	50	

1. (a) Create an Alice world with a `Tortoise` and a `WhiteRabbit` in it, as well as a "finish line" in the distance (use whatever object seems best to make your finish line).

   (b) When the user types `T`, the tortoise should move 1 meter towards the finish line. When the user types `R`, the rabbit should move 1 meter towards the finish line. And, if user types the space bar, 50% of the time the tortoise should move 1 meter towards the finish line and 50% of the time the rabbit should.

2. (a) This problem is based on the `PushCounter` program from the book (available from the CD or Blackboard). The program consists of the files:
   `PushCounter.java`, `PushCounterPanel.java`, and `ButtonListener.java`.

   Add a button and a corresponding listener that will zero the counter (that is, when your new button is pushed, the counter will be set to zero and that will be displayed in the text field.

   (b) Add a third button and listener that **increases the counter by 5** and updates the text field accordingly.

3. (a) Write a Java program that counts how many letters you entered and prints that to the screen.

   (b) In addition, count how many spaces the user entered and display that number on the screen.