Assignment #3 -- Slot Machine

Prepare to work on this assignment by creating a work folder called assign3 in your w-number folder. Call your program SlotMachine#.java, where the # is whichever version you are working on at the time. You must start with version 1 (SlotMachine1.java) and get it working before moving on to version2 (SlotMachine2.java), etc.

Version 3.1

Consider a slot machine with 3 spinners. Each spinner can have 3 different pictures: cherries, bell, or a gold bar. If the arm is pulled and all three spinners come up with the same picture, the player wins a jackpot. If they don’t match the player loses.

We will write a DialogProgram to simulate this slot machine by generating a random number for each spinner. Each random number is an integer from 1 to 3, which we can create using the Math method random(). This method requires no parameters, and returns a random number each time it is called, in the range of:

\[0.0 \leq \text{Math.random()} < 1.0\]

which we can manipulate algebraically as follows:

<table>
<thead>
<tr>
<th>Step</th>
<th>Equation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(0.0 \times 3 \leq \text{Math.random()} \times 3 &lt; 1.0 \times 3)</td>
<td>multiply each side by 3</td>
</tr>
<tr>
<td>2</td>
<td>((\text{int})0.0 \leq (\text{int})(\text{Math.random()} \times 3) &lt; (\text{int})3.0)</td>
<td>convert each side to an integer, truncating any decimal portion</td>
</tr>
<tr>
<td>3</td>
<td>(0 + 1 \leq (\text{int})(\text{Math.random()} \times 3) + 1 &lt; 3 + 1)</td>
<td>add one to each side</td>
</tr>
<tr>
<td>4</td>
<td>(1 \leq (\text{int})(\text{Math.random()} \times 3) + 1 &lt; 4)</td>
<td>yielding a random integer from 1 to 3</td>
</tr>
</tbody>
</table>

So, using the formula \((\text{int})(\text{Math.random()} \times 3) + 1\), generate random numbers for 3 spinner variables. If the values are equal, print out all three values, followed by the string "Jackpot!" If the values are different, print out all three values, followed by the string "You Lose!"

For example, if the 3 spinner variables have values 2, 1, and 1 respectively, your program would display:

![Message](image1)

But if the 3 spinner values have values 2, 2, and 2 respectively, your program would display:

![Message](image2)

(It would also be a jackpot for values 1, 1, and 1 or 3, 3, and 3.)

Win or lose, your program should then ask the user to enter the number 1 if they wish to play again, or some other number to stop. If they enter the number 1, you should call the main() method to cause the program to start over. (Yes, the main() method can contain a call to itself. This is known as a recursive call.)

When you get this version of the slot machine working, make sure you include the required comments (including descriptive comments for each variable in your program), and then commit it with the log message "Slot Machine version 3.1". If everything is correct, you will earn 75 points (C level) for Assignment #3.
Version 3.2

Modify version 3.1 to use a GraphicProgram instead of a DialogProgram. Display 3 colored rectangles in the window for the 3 spinners. Fill each spinner with a color based upon the value of the corresponding spinner variable: red for 1, blue for 2, and yellow for 3. If there is a jackpot, display the string “Jackpot!” in large magenta letters under the spinner rectangles. If not, display the string “You Lose!” in large black letters under the spinner rectangles. If the user wishes to play again, remove all the graphic objects before calling main().

When you get this version of the slot machine working, make sure you update the required comments (including descriptive comments for each variable in your program), and then commit it with the log message “Slot Machine version 3.2”. If everything is correct, you will earn 85 points (B level) for Assignment #3.

Version 3.3

Modify version 3.2 to have different jackpot levels. If all three spinners are red, display the string “Break Even!” in large red letters under the spinner rectangles. If all three spinners are blue, display the string “Jackpot!” in large blue letters under the spinner rectangles. If all three spinners are yellow, display the string “Super Jackpot!” in large magenta letters under the spinner rectangles. If the colors don’t match, you should still display the string “You Lose!” in large black letters under the spinner rectangles. If the user wishes to play again, remove all the graphic objects before calling main().

When you get this version of the slot machine working, make sure you update the required comments (including descriptive comments for each variable in your program), and then commit it with the log message “Slot Machine version 3.3”. If everything is correct, you will earn 95 points (A level) for Assignment #3.
**Version 3.4**

Modify version 3.3 to use pictures and to visibly flash through multiple pictures on each play, before stopping on the final values. You may use the images found in the assign3 folder in the files section of our class webpage if you wish, or you may make your own, as long as they are tasteful. Avoid offensive images or words, as they will result in a failing grade. You may also wish to use more than 3 images per spinner, different images on different spinners, more than 3 spinners, other types of wins, etc. Use your imagination!

When you get this version of the slot machine working, make sure you update the required comments (including descriptive comments for each variable in your program), and then commit it with the log message "Slot Machine version 3.5". If everything is correct, you will earn at least 100 points (A+ level) for Assignment #3. You might even get extra credit for a really impressive program!

**What to turn in**

Commit versions 3.1 thru 3.4 in sequence as high as you can before **the beginning of class on Monday, March 6, 2006**. Remember that you may commit multiple times for each version if you wish (and it is a good idea to do so for every major change or at the end of each work session). You don’t have to make it all the way up to any version beyond 3.1, but of course, if you do, your grade will be higher (as long as it is correct). Remember to have fun, and get help from the instructor when you need it!