

COEN 120 Final Exam, Fall 2002 -- SLOT MACHINE



Early slots were typically one line, three reel machines operating on nickels with a jackpot payout for matching three identical symbols like 7's or J's.

In this final exam, your task is to implement an electronic *slot machine* (a.k.a., *one armed bandit*) with the following features:

1. Your *slot machine* has 3 symbol reels and displays the current values of the reels (columns) using the format **X:Y:Z**, where **X**, **Y**, and **Z** are the first, second and third reel values.
2. The **SPIN-TO-WIN** button triggers all the reels of fortune to begin spinning, but only when pushed while the three wheels are **stopped**. The **SPIN-TO-WIN** button does not affect the state of the machine again until all the reels have once again come to a complete stop.
3. There are 5 possible symbol types on each reel: {A, B, C, J, 7}.
4. Each reel contains 10 of these symbols, with varying numbers of each symbol type. Their position on the reel is not important on a one pay line slot (the position is critical on multi line pay slots (which you are *not* designing)).

Reel X:	A	J	7	B	C	J	B	A	J	C
Reel Y:	7	J	C	B	A	7	J	C	B	A
Reel Z:	A	J	C	B	7	A	B	C	A	B

5. Each reel spins at a different, random rate between **0.2-1.0** seconds per symbol. The reels should stop gradually, (i.e. the rate of spin should slow down as the spinning proceeds, until the reel is stopped.)
6. The reels randomly stop in sequence, from left to right, **1-5** seconds after the reel to its left stops. Similarly, the leftmost reel (X) randomly stops **3-5** seconds after pushing the **SPIN-TO-WIN** button. These times should be random for each reel. The rate and duration of spin for each reel is randomly determined (independent of the other reels) with each new push of the **SPIN-TO-WIN** button. Each reel should display its own symbols as it is spinning.
7. If the symbols match across all three reels (columns), indicate **"WINNER!"** If the symbols are all 7's, display **"\$\$\$\$"**. If symbols are all J's, display **"\$\$\$"**. All others, e.g. A's, B's, or C's, display **"\$"**.
8. The reels should continue from where they left off each time the **SPIN-TO-WIN** button is pushed.

Extra Credit: Add a bet input for aggressive players who wish to win/lose quickly, wherein a player may bet between 1-3 coins for each play. Adjust the **"\$\$\$"** output accordingly, where a **"\$"** pays 1/1, a **"\$\$\$"** pays 3/1, and a **"\$\$\$\$"** pays 10/1. If a player has bet 3 coins and hits **"\$\$\$\$"**, then the payout is 50/1.

The Function for generating Random Numbers is `int rand()`. It returns a pseudo-random number on the interval 0-65535. You can seed the random number generator with `srand(int)`. Include the `stdlib.h` file. Both of these are explained in the VxWorks reference manual.

For the exam, create a Use Case, an Object Model Diagram, and an appropriate state chart for each object requiring one.

You will have 3 hours to complete your design and testing. You should attempt to demonstrate your final product to me running on a target system. Please save your ENTIRE project folder to your Student account.

You should name your exam report with your FirstInitial-LastName_FinalExam.rtf (e.g. nquinn_FinalExam.rtf).

Happy spinning and Good luck!