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Design Project Proposal

**Game: Code Breaker**

**Projection description:**

Imagine you are special agent FPGA. You must break into a heavily guarded safe in order to complete your mission. Unfortunately, a lock that is the NEXYS3 board and guards this fortress. You must break into this fortress at all costs, but you must solve the combination.

We are going to do a game where you have to guess a certain combination that is randomized. If you guess the combination within a certain parameter, then you win and get into the fortress. The NEXYS3 board will be used.

This project will sort of rely on the knowledge of finite state machines and understanding of cycles.

**How to Win:**

To win you must inductively guess what the input is to “break the code.” Act as though you are trying to break in a safe with limited amount of time and tries. The game will utilize the 8 switches on the FPGA, which yields 256 possibilities. These possibilities will be heavily decreased with the output of how many switches are right. The person will have 7 tries before they lose.

**Attributes**:

Switches – Use these to guess a combination that is the code

Buttons – The middle one will be used to submit your guess. The right one will start the game or reset it to an initial state. The other ones can be used for input as well.

Seven segment display – Tells you how many inputs are correct, will not tell you which ones though and how many tries you have left. The left 2 digits will show how many tries you have the right side will show you how many inputs were correct

**Things to add to make it more fun:**

Point system – the faster you solve the lock, the more points you get

Speaker – We you solve the puzzle, a music will be made that you solved the puzzle, if you get it wrong it will make a certain sound

Multiple rounds – multiple randomly generated combinations can be presented instead of just doing 1 round

**Things Needed:**

Counters

1 Clock signal, more if we are creating a point based on time system. This can be a continuation of the stopwatch lab we did.

Module for the seven segment display

**Grading System:**

40% - Getting it to work

15% - Seven segment display works

10% - Timer to make sure you can’t think for a super long time

10% - Point system

5% - Random combination generator

20% - Display the number of tries and attempts correctly