

Die Rolling Simulator Arduino Project

Report

This is a report for my Arduino Project, Coursework 2 of CM10194 Computer Systems Architecture 1.

Problem: When playing table top games or during other activities, players do not have access to the most commonly used types of dice.

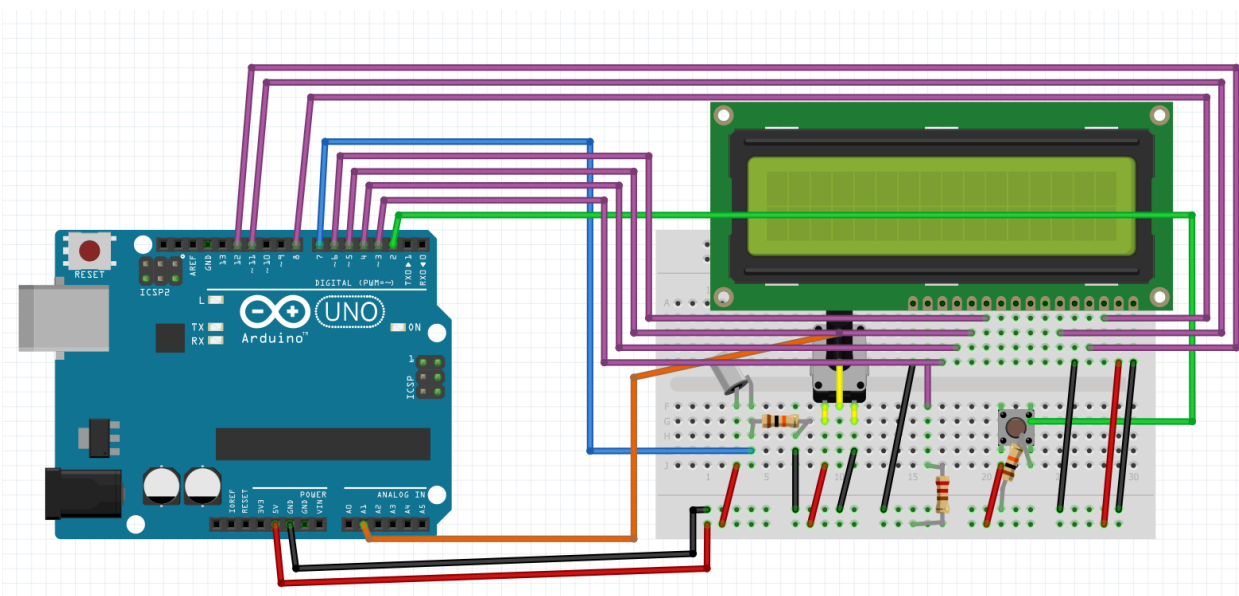
This is a prototype for a die rolling simulator device, where players participating in games like Dungeons and Dragons or other table top RPG games can simulate rolling a variety of dice: D2, D4, D6, D8, D10, D12 and D20. The final version of the device will be in the shape of a cube, similar to that of a D6 die although quite bigger.

The device uses a tilt sensor, a potentiometer and a push button for input and an LCD screen for output. The potentiometer is used to change the type of die to be rolled. Its value is read by the Arduino every loop if the it is not in “rolling mode”. This value determines the type of die to be rolled. The tilt sensor is used to detect the device’s movement (e.g. shaking the device or turning the device upside down). When movement is detected, the tilt sensor’s current state (HIGH or LOW) is read. If the current state of the tilt sensor is different than its previous state and is LOW (the ball inside the sensor is not touching the bottom), the device will switch to “rolling mode”. In “rolling mode”, the device will simulate rolling the die by displaying “Rolling...” on the LCD screen. After 2.5 seconds, a random number between 1 and a maximum value determined by the type of die is chosen and then displayed. As long as the device stays in “rolling mode”, it will keep displaying the result of the roll. This is to prevent the device from rolling again by moving it. Only by pressing the push button can the device exit the mode, after which it returns to the original screen. Another player can now choose the type of die and roll again.

I chose to connect every component listed above, except for the potentiometer, to a digital pin on the Arduino. The potentiometer is connected to an analogue pin. This made it very simple and straight forward to build the circuit.

I could have also made it possible to adjust the number of dice to be rolled but I ultimately chose not to for the prototype due to the size limitation of the breadboard. The final version of the device were I to build it would include this feature.

Breadboard:



Schematic:

