



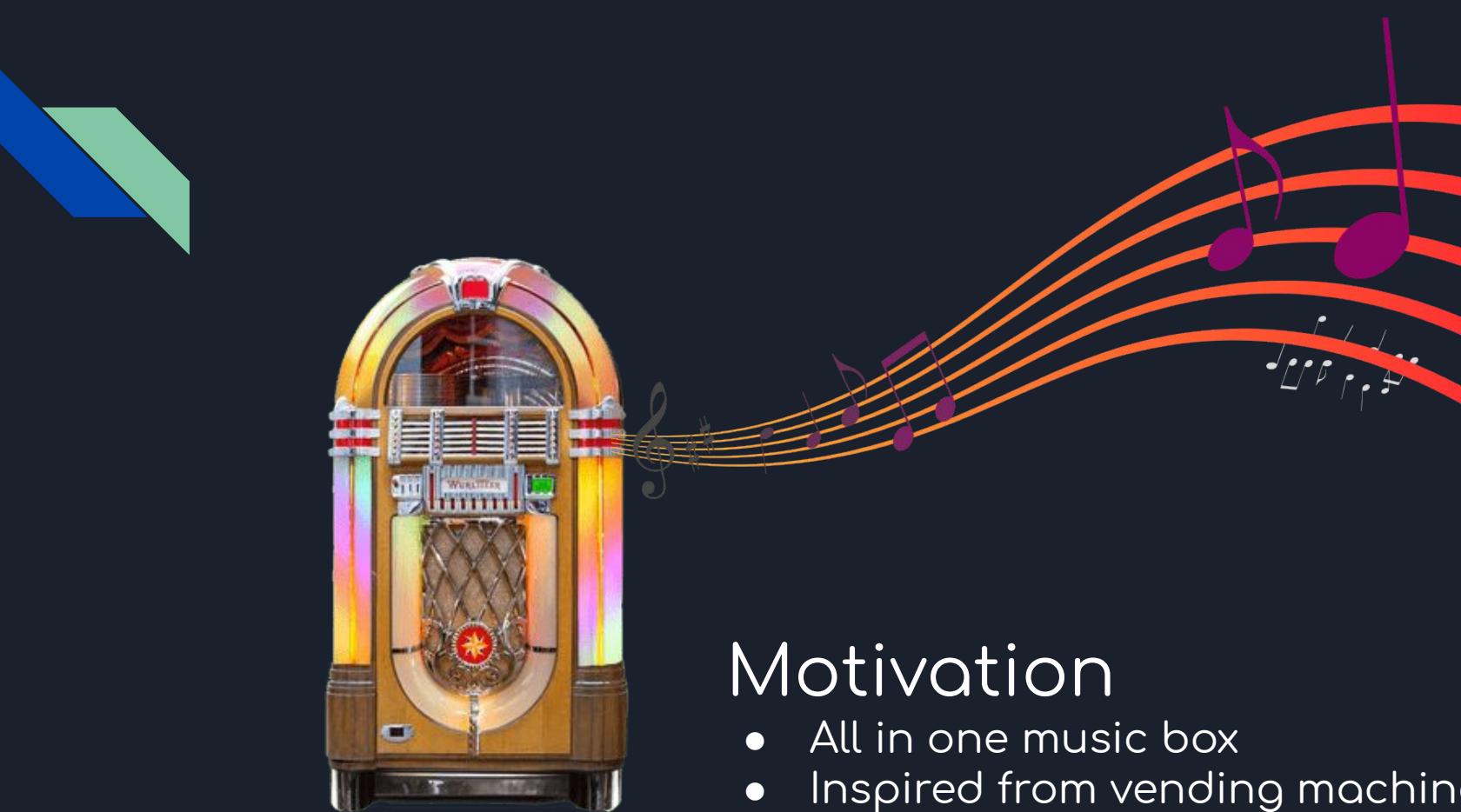
UCSD - ECE 144 Labview Programming Music JukeBox

Team 3
Wing Wong, Ray Yu, Shuchang Liu



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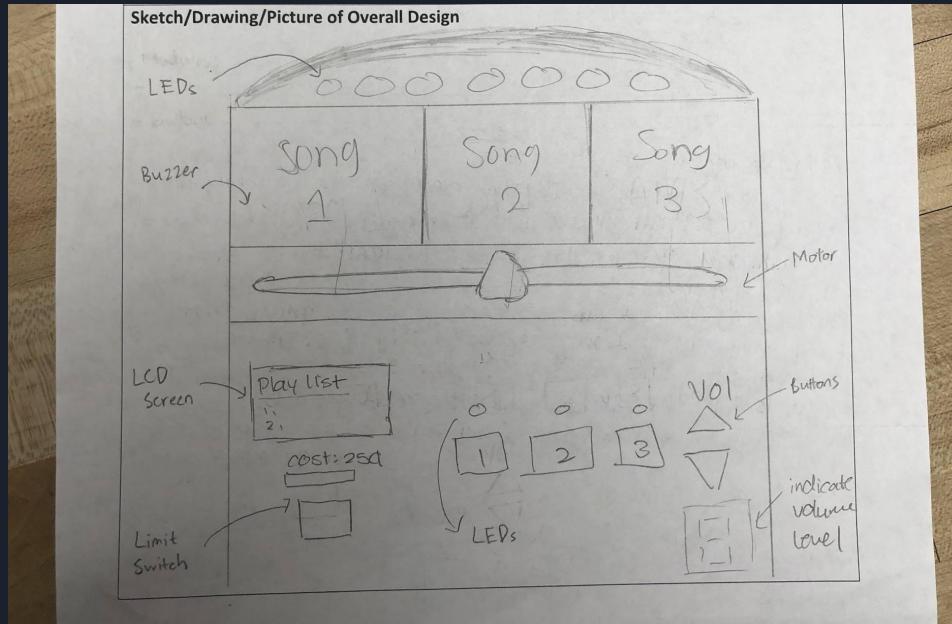
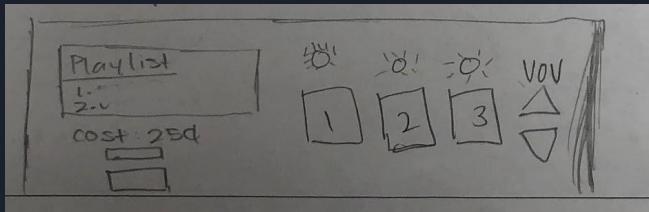
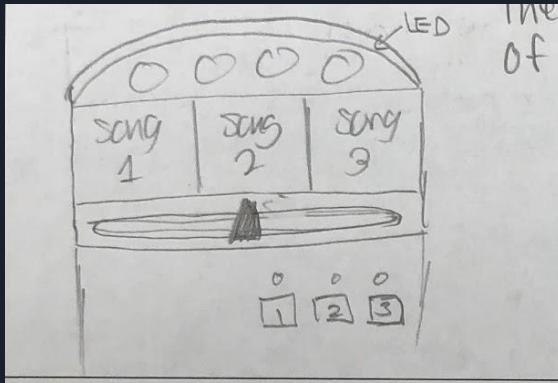
- Motivation
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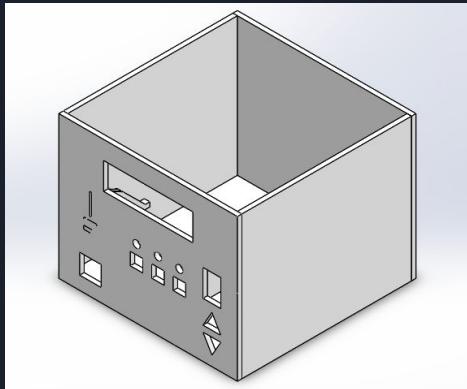
Motivation

- All in one music box
- Inspired from vending machine

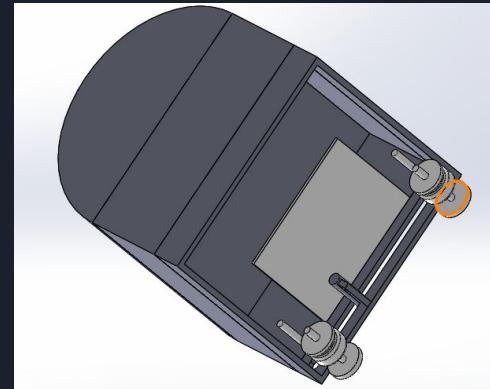
Evolution of Design - Sketches



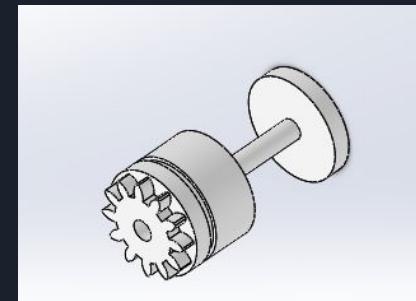
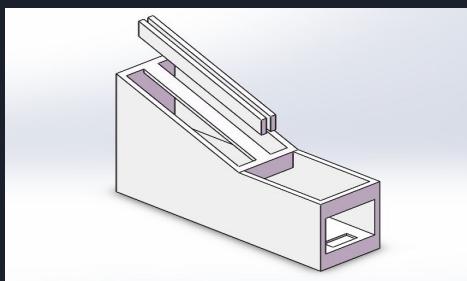
Evolution of Design - SolidWorks



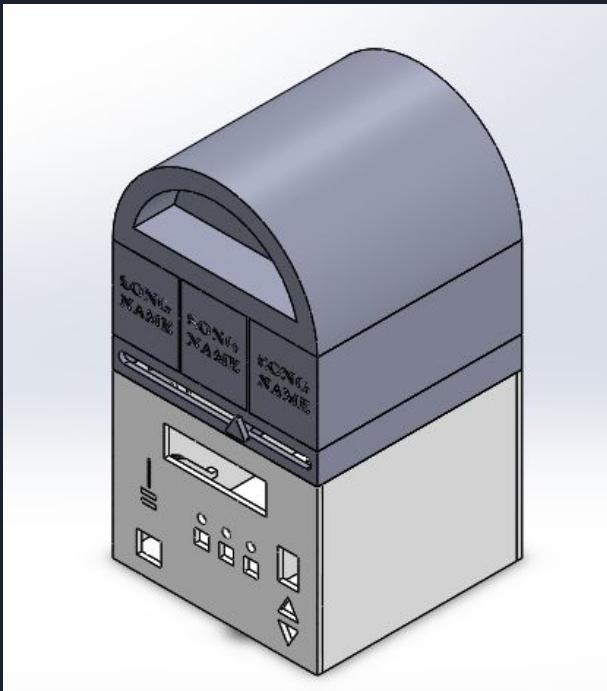
Bottom part



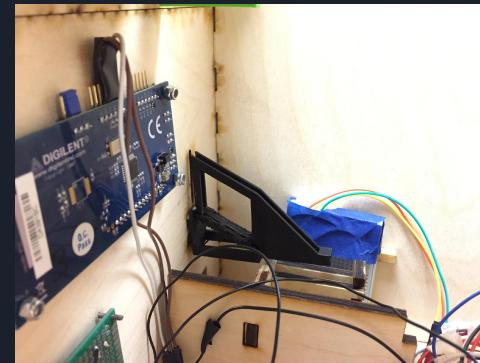
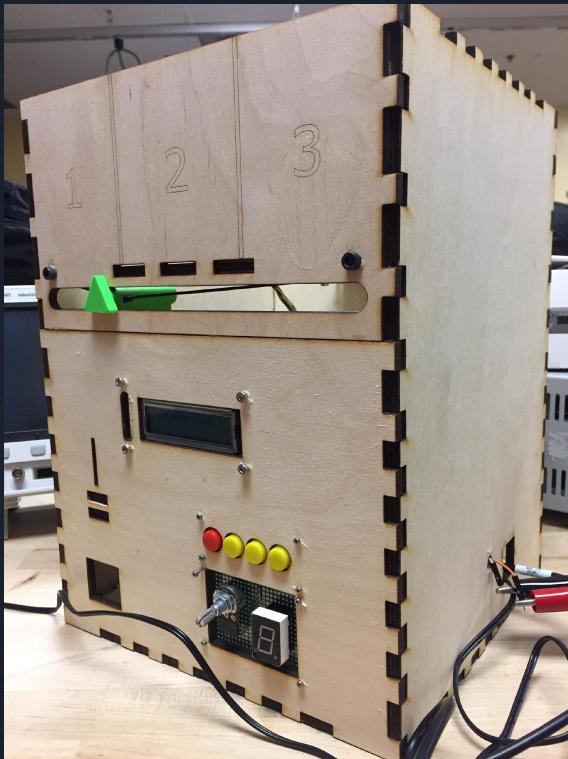
Top part



Evolution of Design - SolidWorks

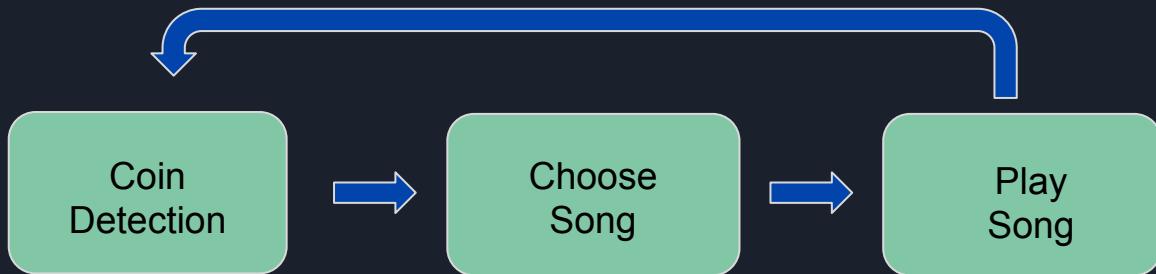


Evolution of Design - Final



- 3 music slots
- 3 stopping positions
- Coin system
- Volume control

State Diagram



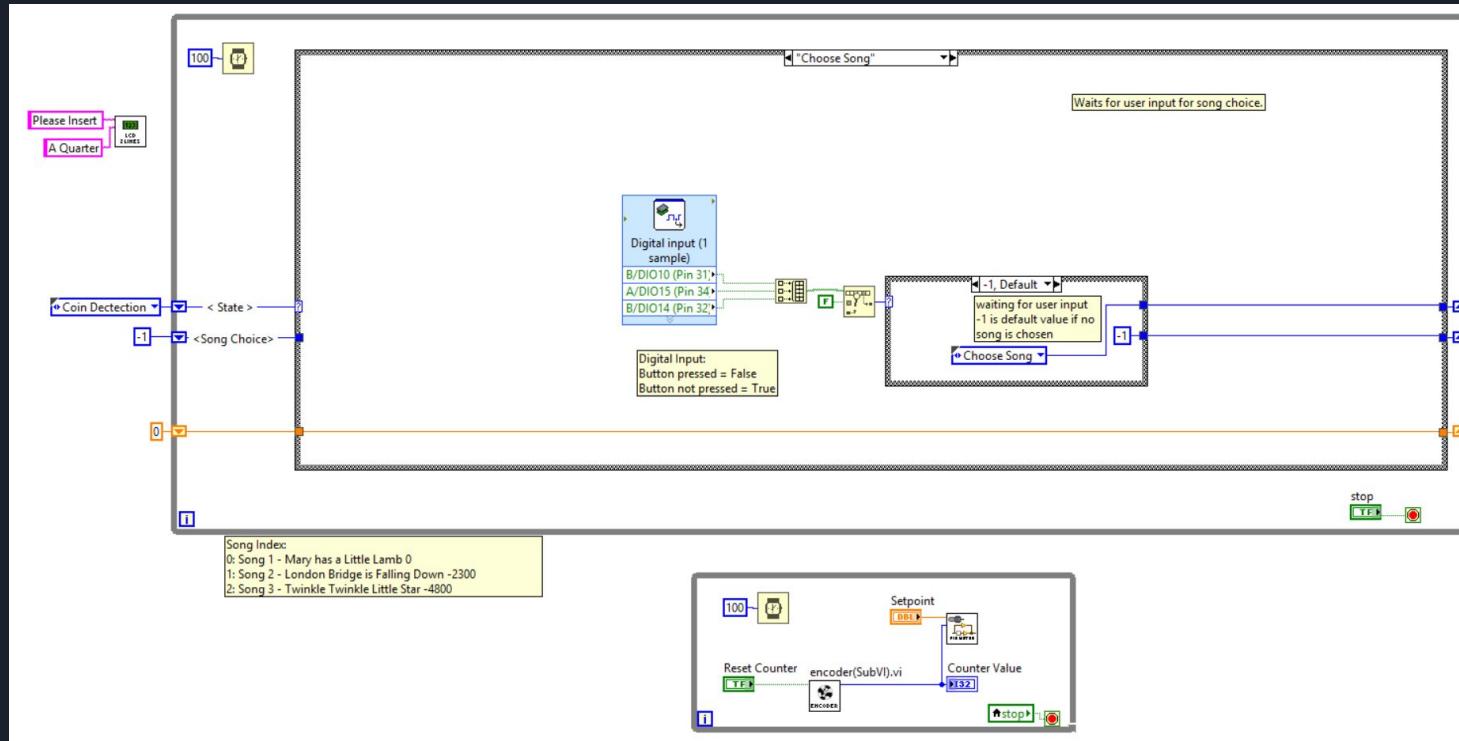
Input Modules:

- Potentiometer
- Button
- Optical Limit Switch

Output Modules:

- Motor & Encoder
- Buzzer
- 7-Segment Display
- LCD Display
- Micro Servo

Main VI: 3 states



Operational State

Coin Detection State



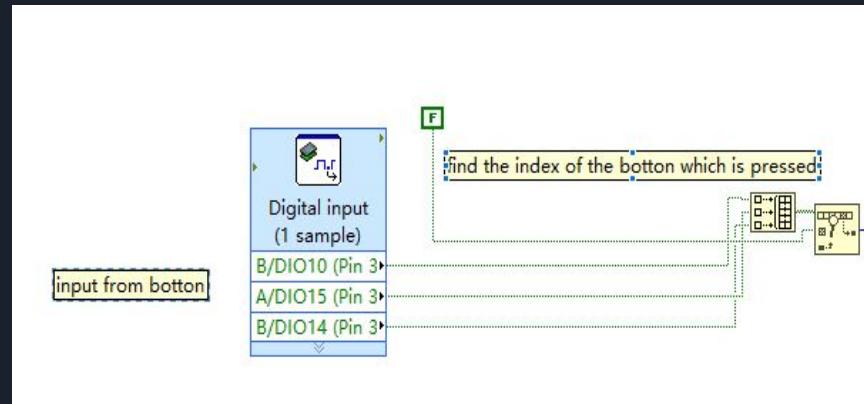
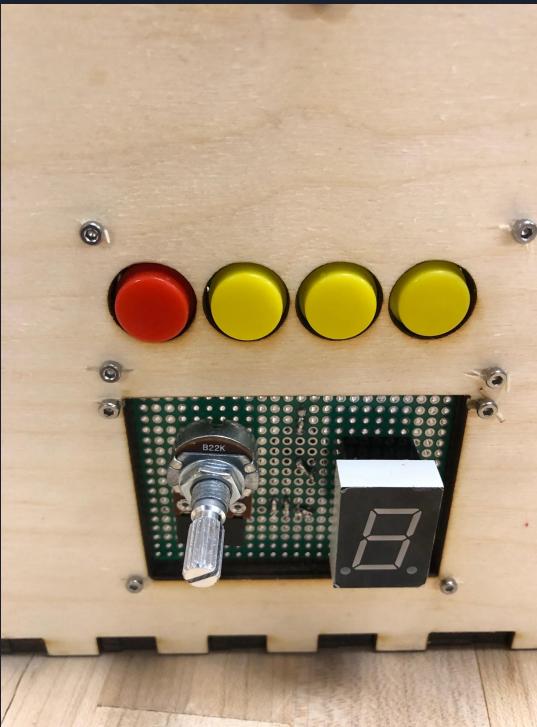
Choosing Song State



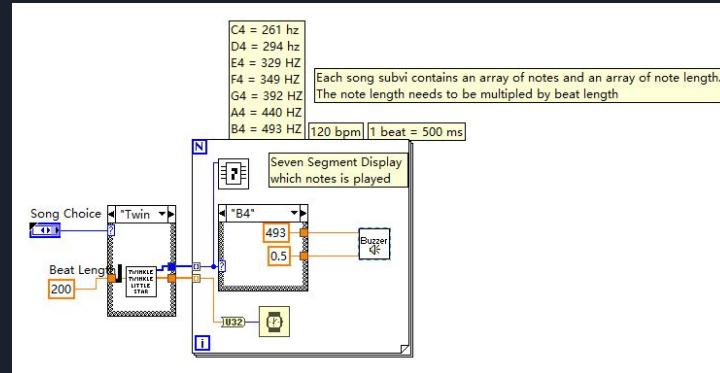
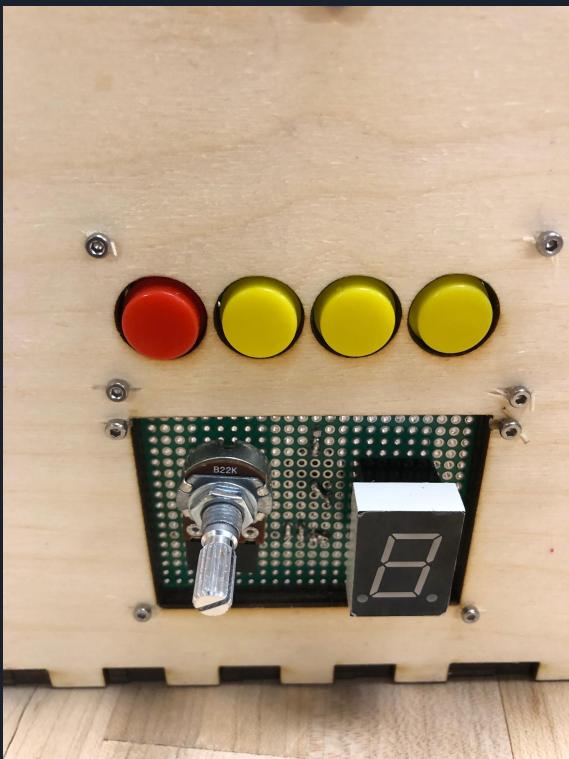
Play Song State



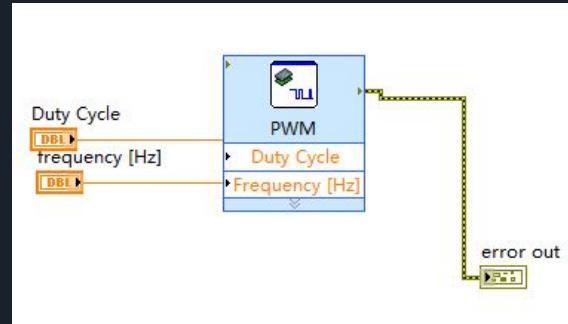
Integration: Button and Volume Knob



Integration: 7-Segment Display and Buzzer

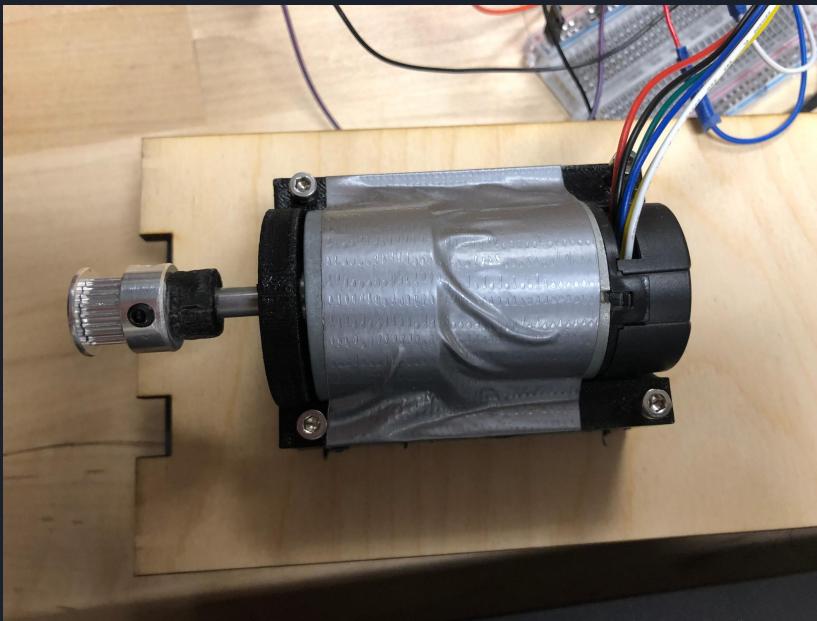


7 segment display

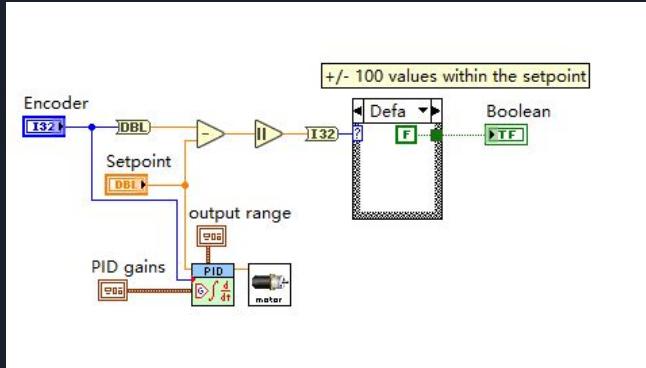


Buzzer

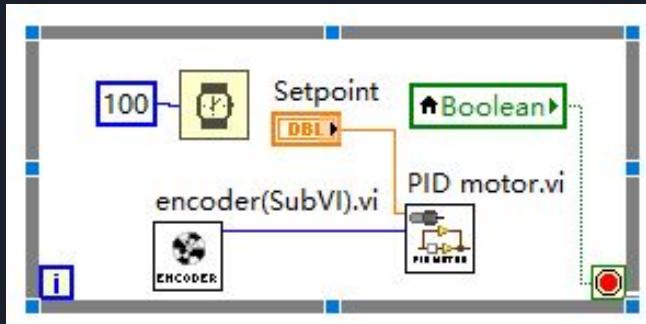
Integration: Motor and Encoder



Integration: Motor/Encoder



PID control

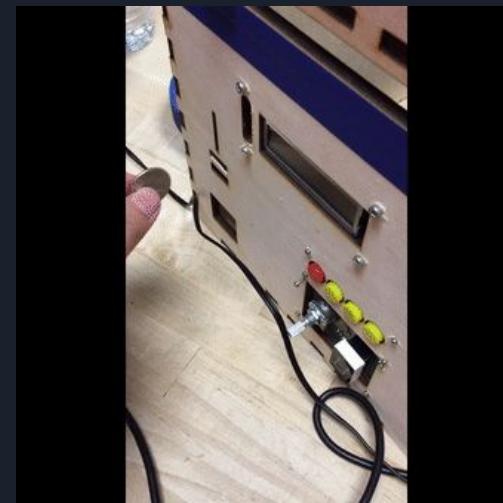
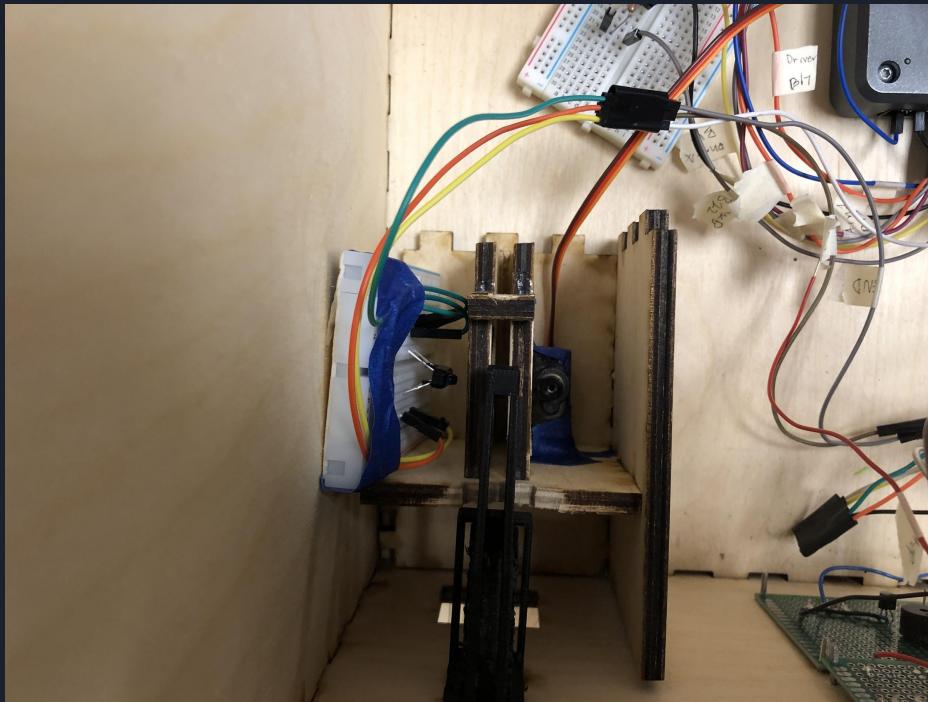


Motor:
Driving force
Direction

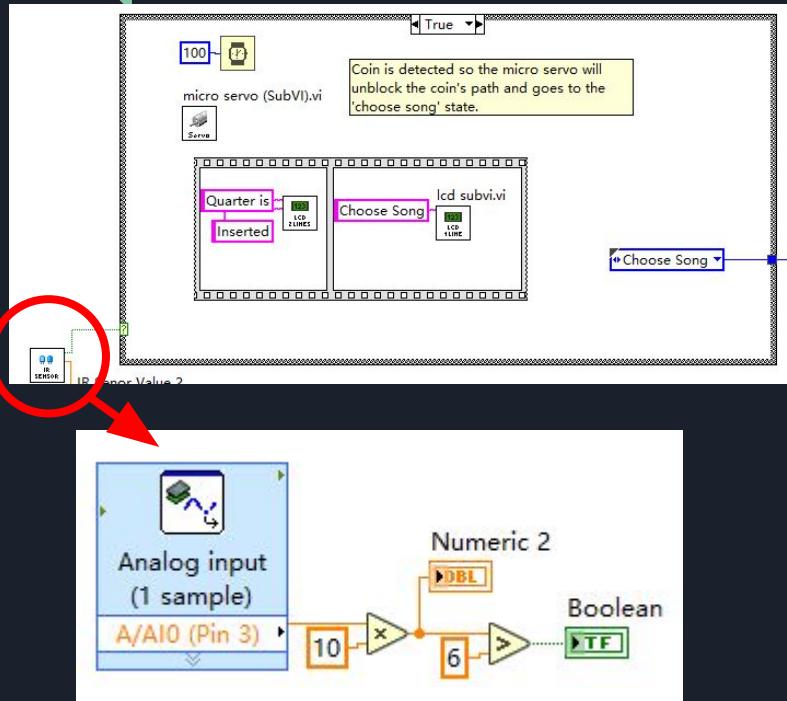
Encoder:
Read position

Integration: Coin Detection

- Optical Limit Switch
- Micro servo



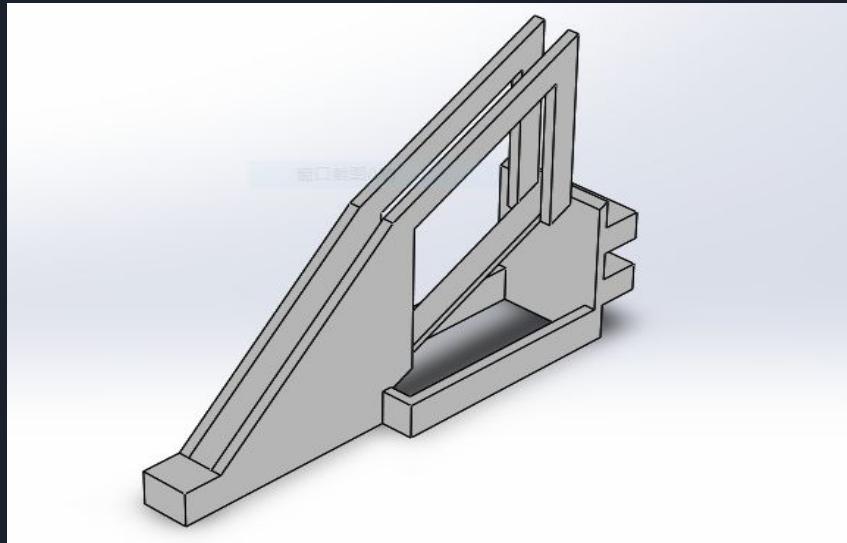
Integration: Optical Limit Switch



Judging code



Mechanical Design: Selector



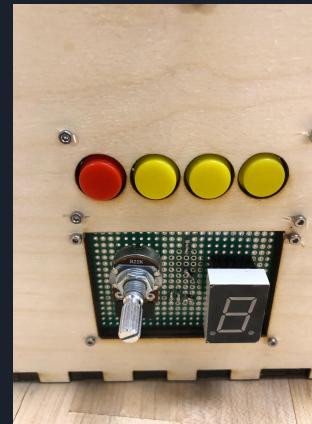
CAD design



Separating process

Highlights

- 3 states using limit switch, motor, buttons, LCD
- Implementation of track belt for better traction



- Volume Adjustment
- Coin system using optical limit switch

Challenges

Mechanical

- Activation of optical limit switch
- Track belt tension/movement
- Position of the 
- Organization of wires
- Volume control

Labview

- Motor rotation
- Control logic
- Modules sequence

Challenges: Motor Friction



Before



After



Potential Improvements

- Better mechanical design on indicator
- Error management in code
- Change the control to be nonlinear
- Use Bluetooth module
- Improve the user interface
- Use speaker instead of buzzer

Demo

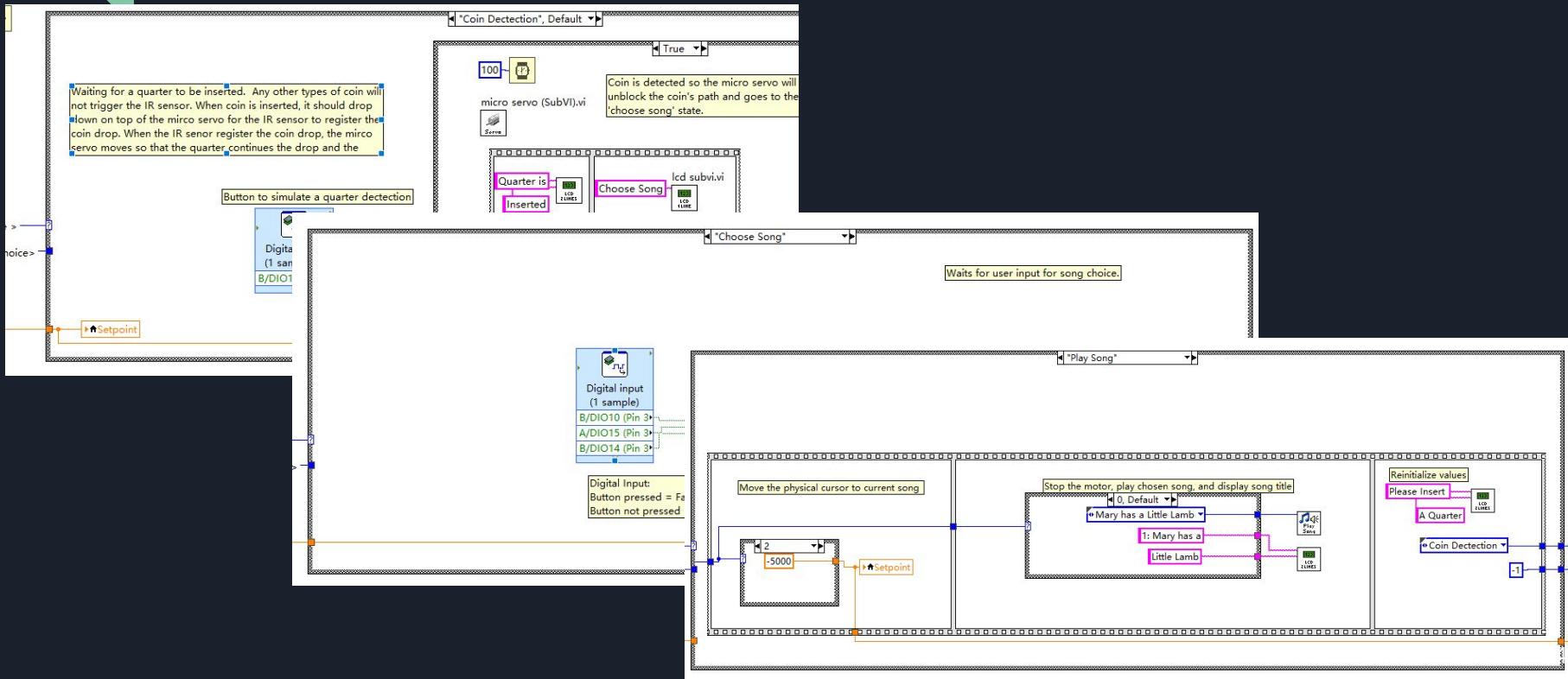




Thanks for your listening!

The END

Extra Code



Modes

- 3 states
- Coin -> button -> music -> position

