BOP IT PROJECT: THE STOCK MARKET BOP IT

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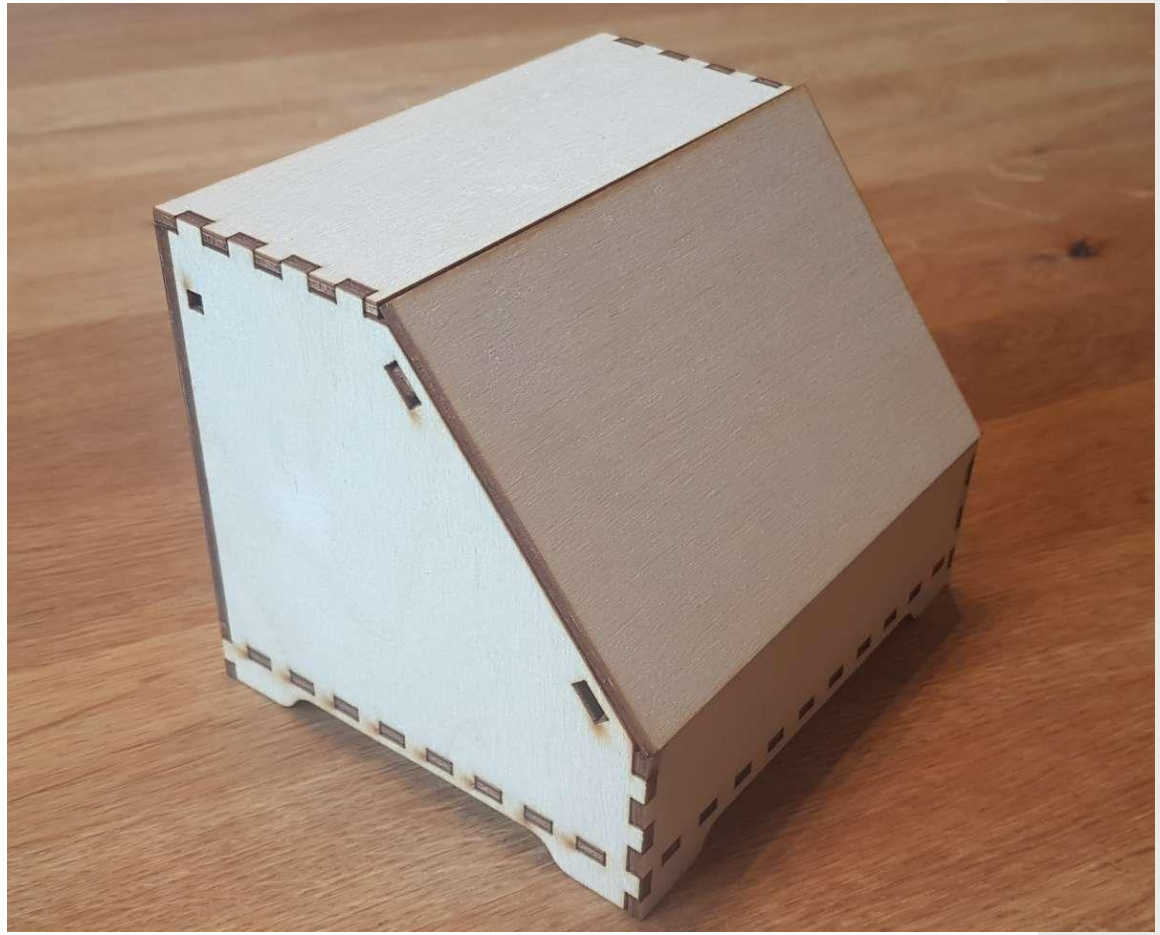
SOFTWARE IMPLEMENTATION

- In Arduino's programming language we instantiate an LSM6DSOX gyroscope, an LCD screen, a sound detector, some buttons, and several pins on the ATMEGA328P to create a game like the Bop It toy with a stock market theme.
- The game has several sensors (buyItPin, sellItPin, and holdItPin) that the user must interact with based on prompts given by the game, such as pressing a button when prompted to "buy," yelling into the sound detector when prompted to "sell," and shaking the enclosure when prompted to "hold."
- There are green and red pins are used to light up the corresponding LEDs, when the user makes a correct or incorrect decision respectively, and the buzzer pin is used to create sound effects through an 8 Ohm speaker.
- The code initializes various variables and arrays, such as the time the user must complete each action within, the current score, and a set of musical notes that can be played through the buzzer.
- The program includes a game loop that waits for user input based on the prompt given by the game. If the user completes the action before the time limit expires, the score is incremented, and the next action is prompted. If the user fails to complete the action or time runs out, the game is over, and the final score is displayed on the LCD screen.
- We have tested the power (input), buttons (input), sensors (input), ATMEGA328P (control) and speaker (output) on a breadboard thoroughly to know the circuit design should work once established on the PCB.
- For simplicity, no code is show, but a repo of this code can be viewed here.

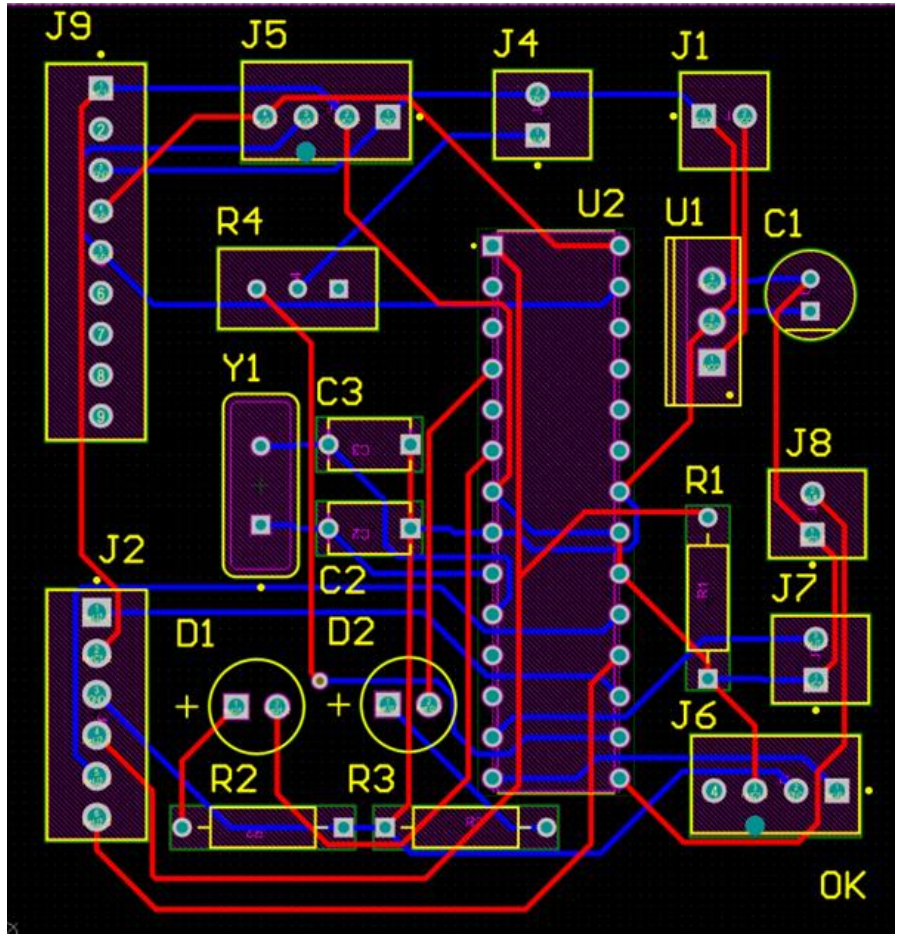
ENCLOSURE DESIGN

- The design is based off the shape of a cash register to fit the theme of our bot-it game.
- The inputs and outputs such as buttons, switches, LED displays, and microphones will have cutouts to allow the user to interact with them.
- This design process was picked due to the simplicity of our encloser allowing for it to be easily done on the laser cutter.
- The board will be mounted on the floor of the enclosure and the sensors and outputs will be mounted on their cutouts.



PCB DESIGN

•For organization in the enclosure jumper pins are on the outside of the board. Wires connected to these jumpers will be used to put the circuit components in the spot designed in the enclosure
•J2 is for uploading new code to the ATMEGA328P IC if need be
•Gyroscope (J9) will be mounted to board.
•Circuit will be powered by 9V battery (J1) and a 5V regulator (U1) is used to keep the power constant and controlled



FINAL DESIGN OF THE STOCK MARKET BOP IT

- Our design uses black and clear acrylic cut by the laser cutter to look like a cash register.
- Button at the top left starts the game.
- Button in the center with a dollar sign is for "BUY IT!"

  This button also makes a cool "Cha-Ching" sound.
- Gyroscope inside attached to the PCB is for "HOLD IT!"
- Sound detector hidden near the speaker is for "SELL IT!"
- Speaker for the sound prompts.
- Switch on the back to turn the unit ON or OFF
- LCD display to show the prompts.
- 2 LEDs on the front, green and red, to confirm you completed the action in time.