Preliminary Project Proposal:

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Our initial Bop It idea is a slot machine. This Bop It will have four tasks: spin it, lose it, bet it, and win it. For these tasks, the player will spin a dial/pull a lever, shake the device, hit a button illuminated by an LED, and scream into the device respectively.

The Bop It will be a 3D printed enclosure with casino-like decorations on it. Within the enclosure would be the PCB, battery pack, and internal wiring for the game. The enclosure will have a cutout either on the side with an LCD screen to display score. Once the player starts a game, the score will be counted on the screen and flash red if the player loses and the speaker will play a “losing” audio. Upon the win condition, the speaker will play a “winning” audio and the screen will flash green. After losing the game, the player’s score will be held on the screen for a certain length of time before returning to the start screen. If a player hits the win condition, the Bop It can continue to be played until the player loses.

As the game goes on, the time to complete the tasks will decrease and the thresholds (acceleration, sound level, etc.) would also increase.

Block diagram and functions:

Button: “Bet it” task interface. The user will push a button to place a bet. Implemented by a regular two-state button.

Switch: “Spin it” task interface. The user will pull a lever which triggers the switch state. Implemented by a regular two state switch.

Gyroscope/accelerometer: “Lose it” task interface. The user will shake the device. Implemented by the SparkFun 6 Degrees of Freedom Breakout sensor.

Sound detector: “Win it” task interface. The user will yell at the device. Implemented by the SparkFun sound detector.

MP3 Trigger: Will output commands for user to follow for each task.

ATMega: Controls all sensor inputs and outputs; implements all logic for the game.

Diagram

Description automatically generated

Microcontroller pseudo-code:

while (score<100) {

bool pass\_level = false

randNum = random number 0-3

if (randNum = 0) //bet it

MP3\_trigger\_input = mp3\_file(0) //speaker says “bet it”

wait (1 seconds – 1microssecond \*score)

if (button\_output = true)

pass\_level = true

if (randNum = 1) //spin it

MP3\_trigger\_input = mp3\_file(1) //speaker says “spin it”

wait (1 seconds – 1microssecond \*score)

if (switch\_output = true)

pass\_level = true

if (randNum = 2) //lose it

MP3\_trigger\_input = mp3\_file(2) //speaker says “lose it”

wait (1 seconds – 1microssecond \*score)

if (gyroscope\_output = true)

pass\_level = true

if (randNum = 3) //win it

MP3\_trigger\_input = mp3\_file(3) //speaker says “win it”

wait (1 seconds – 1microssecond \*score)

if (sound\_output = true)

pass\_level = true

if (pass\_level = true)

score = score + 1

LCD\_display(score)

else

LCD\_display(score)

LCD\_display(game\_over)

break while loop

}

Team Roles:

Adam – CAD and enclosure design

Kaleb – Software programming

Lauren – Hardware assembly

Potential Final Design Model:

A person playing a video game

Description automatically generated with low confidence