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DICE 3010

Midterm Project

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Source to Sparkfun page: https://learn.sparkfun.com/tutorials/blynk-board-project-guide/project-13-push-door-push-phone

Outline of Linear Sequence:

1. One magnet is placed on the lib of the box while another opposite magnet is

   placed on the inside of the box so that both magnets are touch when the box is

   closed.

2. When the box is opened, the magnets separate.

3. A notification is first sent to the owner's phone when the box is opened.

4. Then a second notification is sent to the owner's phone when the box becomes

   closed again.
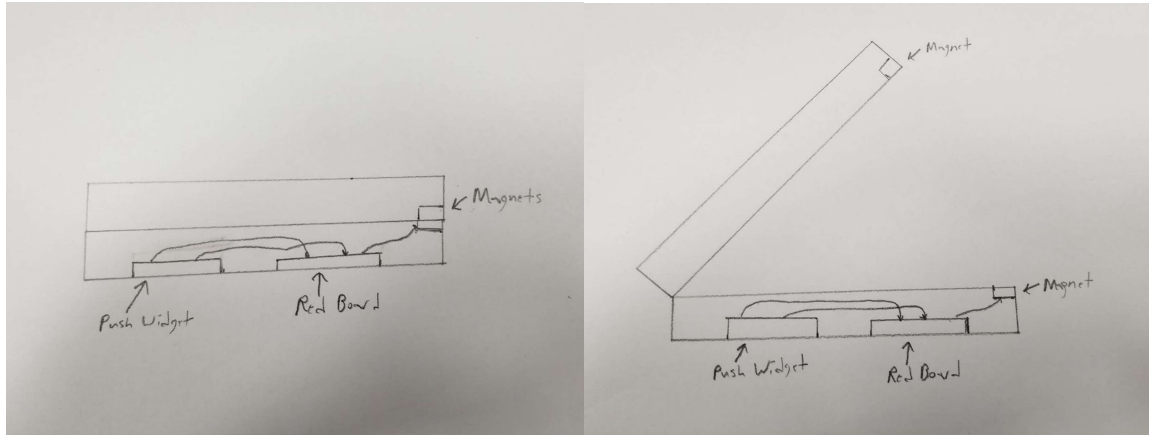
Outline of Information Being Processed:

1. Magnets are used as the main force to tell the sensor if the box is open or not.

2. Once the magnets separate, the sensor recognizes the force is missing sending an alert to your phone.

3. When the magnets are not touching, the notification will read "Door open."

4. When the magnets are then touching again after separating, the notification will read "Door closed."

Model in the Real World:

I feel like this kind of application could be used in both a security sense, as the spark fun page is making it out to be, but also in a more practical sense as well. This kind of application could be used, for example, to notify a homeowner if they or someone else left the refrigerator door open. Or, this could be even used by farmers or animal handlers to be notified if the door housing the animals has been opened.

Computing Concepts:

Logic: The logic behind this application seems to be asking the system only checking whether or not the door on the box is open. The system would look for, if the box is open, send notification to the user. Then if the box is closed again, send another notification to the user. Otherwise do nothing.

Decomposition:

Step1: Sense if magnet on door and box are separated which signifies that the box is open.

Step2: If magnets are separated, send notice to phone that the door is open.

Step3: Sense if magnets are still separated or brought back together.

Step4: If magnets are still separated, leave message of door still open. Otherwise, if the magnets are brought back together, send notice to phone that the door is now closed.

Patterns: I think the only pattern that the system is looking for is when the door is initially opened and the system goes in a loop checking to see if the door is closed again so it can send a new notice to your phone.

Abstraction: What seems to be prioritized by the system is sensing when the magnets are initially separated. What seems to be ignored is the sensing of the magnets while they are initially together.

Algorithmic Thinking: The algorithmic thinking behind this application seems to be a nested if/else statement. I imagine the logic statement set up as:

if magnets are separated

print notification("Door open.")

if magnets are brought back together

print notification("Door closed.")

else leave notification("Door open.")

else do nothing

Evaluation: The best way I can see to check if the system is working well is to try opening and then closing the box with your phone next to you to see if you receive both notices correctly. A test-case that could be used to check the system would be to try opening the box and then closing it as soon as the magnets separates to see how fast the system can process the information of the magnets separating and coming back together quickly.

1) The mental model for this system offered to the user is a security system for their box in order to keep certain possessions secure. The user interacts with the system through their phone when they are notified when someone has opened their box. The reason someone would use this system seem to be for those who want to monitor their box while away. This allows for users to leave their box out of sight but still have security in knowing if someone is going through its contents. I think this is a worthwhile system for its potential. I think you could use this same concept for farmers to keep track on when their animal pen doors are opened to prevent the animals from getting loose.

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