Team 12

ECE 411

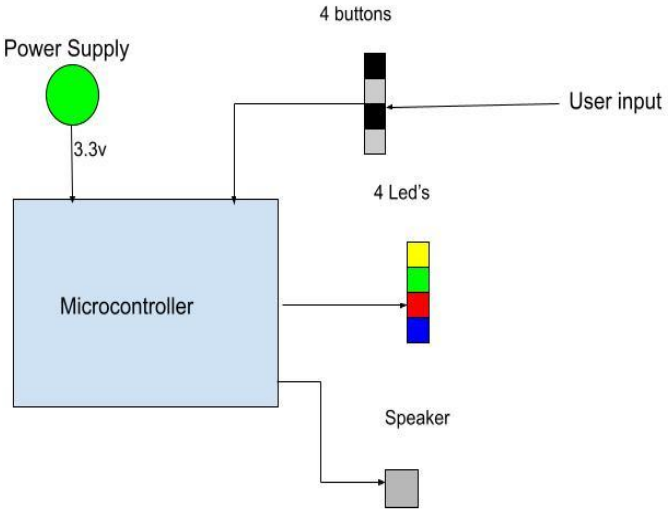
Homework 3

PDS

Product Design Specification for Simon Says Game

- **Executive Summary**
    - A single and multiplayer electronic game toy that interacts with players through four push buttons, combined with interactive LED light show and sounds from speakers. Players have to successfully repeat sequences of button presses provided by the game within a time limit in order to progress further in the game. The combination of tempo-progressive gameplay, interactive LED lights show and sounds provides players with unique, fun, and immersive experience.
- **Brief Market Analysis**
    - The intended customers are practically anyone who wants to have some fun. As long as you are old enough to understand the basics of the game, then you are eligible to play. This product would be most special to people who collect or like to play classic games (board games, cards, video games, etc.). It is also a good family game night item to show off who has the best memory and therefore is clearly the best person in the group. Because it is a game, we can assume the product will be more popular with the younger generation, but that doesn't mean older people can't enjoy it as well.
    - There is direct competition with a small number of other manufacturers who have the same concept as us - four buttons and lights with sounds. If you look at the bigger picture though, our game is in the same market with other small electronic game manufacturers, such as Bop It, Flashing Cube, Speed Twist, etc. Not many people buy every game that is out there, so that is why ours must stand out from the competition. In either case, our product easily stands out from the crowd. The Simon Says game is already a popular and well known product. Our game features pretty and colorful lights as well as high quality sounds that provide music and feedback to its user(s). In addition, we have different modes available. The user can decide to play solo (the normal Simon Says game) or play in a party which is a twisted version of Simon Says that allows for more interaction within a group. What was competitive is even more so now.
    - We think a fair price for our product is $29.99. We are using high quality materials and developing a fun game with unique features compared to the competition. And, this is still cheaper than the classic Hasbro game.

- **Requirements**
    - Must:
        - Satisfy the project guideline.
        - Give players a smooth interactive experience with minimal latency.
        - Be fast and random enough for players to not get bored.
        - Have the battery last long enough for two full games.
        - Be portable/handle-able.
    - Should:
        - Have enough battery for testing and demo-ing.
        - Have sound effects to improve game play.
        - Allow players to turn audio on and off.
    - May:
        - Be able to allow players to change mode without rebooting.
        - Allow multiplayer modes.
        - Be able to keep score.
        - Have three modes: easy/medium/hard for players to choose from.
- **Design Specification**
        - MCU: Arduino Uno.
        - Sensor: Push buttons.
        - Actuator: 4 LED’s and speakers.
        - Power: Lithium Cell.
        - Development Environment: Arduino IDE.
- **System Architecture**



Level 1 Block Diagram