SE 101 Project Proposal (Anna 20774612 & Bruce20756461)

Section 1: What is our project

Our project is a LCD/OLED game similar to the T-Rex run where the purpose is for the user to avoid all obstacles in the way. This game will have the options to be controlled by a switch on Arduino or hand movements using a sensor. Also, the fingerprint sensor will allow users to create their own unique user ID.

Section 2: Major software components of our project

The major software components of the project will include LCD user interface and sensors.

Section 3: Prototype Plan

Our first iteration will be an experimental prototype. We would like to explore more about this technology, so we can build a more efficient program later on. The rest of the iterations will be evolutionary prototypes, we plan to build on the code and evolve it to become the real program.

- *Iteration 1: Displayed on LCD screen; Controlled by button*
    a. Learn about the Arduino Uno board
    b. Learn about implement LCD user interface
    c. Learn about Pushbutton switch user interface
    d. Make LCD show things that we want
    e. Make the contents on LCD change when pushbutton switch is pushed
    f. Make the contents on LCD automatically change (rolling)
    g. Create a game map and the player
    h. Make the game map rolling on the LCD while the player can jump up and down by pushing the pushbutton (regardless of the colliding problem)
    i. Develop a detecting system to detect colliding
- *Iteration 2: Displayed on better & Larger LCD/OLED screen; Controlled by button*
    a. Similar process as Iteration 1 but on larger screen
- *Iteration 3: Based on iteration 2, controlled by movement sensor*
    a. Learn about the movement sensor
    b. Try to implement the sensor
- *Iteration 4: Based on Iteration 3, add fingerprint sensor to record every user's record*
    a. Same as movement sensor
- *Iteration 5: Based on Iteration 4, assemble the whole project so that it works effectively* and efficiently

Section 4: Hardware

The hardware components we will use are: Arduino Uno R3; LCD/OLED screens; Pushbutton switch; Wires; Electronics Breadboard; Resistors; Usb cable; Solid hookup wires; Movement sensor; Fingerprint sensor; Micro SD card.

Section 5: Challenges

Some of the anticipated challenges are integrating the LCD screen with the fingerprint sensor (storing the fingerprint and a unique user ID and recall game information of the user) and integrating the LCD screen with the movement sensor (correspond the movements in front of sensor to the movements of the character on screen). Another obstacle we may face is creating maps and the moving objects/ character on the LCD screen.