IM3080 Design and Innovation Project (AY20xx/xx Semester x)
Individual Report

Name: _____TAN KHAI MING_____

Group No: _____4_____

Project Title: _____Interactive (Tetris)_____

Contributions to the Project (1 page)

1. Procured electronics materials for use in project development

2. Utilized web application “Tinkercad” to develop an electronics circuit diagram for software team to test their program using the online Arduino program simulation feature.

3. Developed Tetris game sound effects (main menu music, background music, game over sound, row clear sound).

4. Created 7-segment display functionality that can count from 0 to 99 to capture scores (for both code and wiring).

5. Assisted in the integration of scoring features (high score, current score) and sound effects (main menu music, background music, game over sound, row clear sound) into the main program.

6. Implemented external power to all four 7-Segment displays to allow for more power distribution to other IO components.

7. Implemented external power to all ten LED strips and two “Next Tile” LED strips so they could illuminate brighter for a better overall visual experience.

8. Tidied up circuit wirings by labeling them individual and bundling them together with a zip tie.

9. Mounted the “Next Tile” display hardware module frame, “Current Score” 7-Segment displays, “High Score” 7-Segment displays onto the main prototype.

10. Performed circuit wiring of multiple electronics components consisting of WS2812 LED Strips, Push Buttons, MicroSD Card Module, 7-Segment Displays, Buzzer, Speaker, and External Power Supplies(5V and 9V).

11. Designed Arduino Mega pinout diagram for a clearer representation of each GPIO pin assignment during project planning. (Included in the Group Report)

12. Utilized software “Fritzing” to design the project prototype’s electronics schematic diagram for documentation purposes. (Included in the Group Report)

13. Created Bill of Materials (BOM) for expenses made in the hardware (electronics) team to monitor total spending and material used. (Included in the Group Report)

14. Utilized web application “Tinkercad” to develop a 3D model diagram for better visualization of the project prototype model in 4 views - Front, Side, Plan, Isometric. (Included in the Group Report)

Reflection on Learning Outcome Attainment

Point 1: Design/Development of Solutions State the area: Insufficient power for certain components
The component that I would like to talk about is the SA23-12SRWA 7-Segment Displays. Prior to this project, I tend to give up too easily when coming up with a solution to a problem. In this case, I was presented with multiple SA23-12SRWA 7-segment displays that have been sitting around for 4 years. I gave them a quick test by supplying 5V to see if they lit up but unfortunately that is not the case.

Hence I assumed it is spoilt without proceeding with further testing and requested to purchase new ones to replace the 7-segment displays which were assumed to be spoilt. I later realized that they actually functioning but the reason why they are not lighting up is due to insufficient power supplied to them. It is a huge mistake on my part to request to purchase new components without fully testing them.

Throughout this project, I realized that the solution could actually be right before your very eyes. If I have went ahead to supply 8V to the 7-segment displays instead of giving up and purchasing new ones, I would have solved the problem in a day instead of weeks. Hence, this experience has taught me to consider all possibilities before resorting to buying a new one.

Point 2: Individual and Team Work State the area: Working together in a large group
As one who prefers to work individually, this group project has brought me out of my comfort zone and taught me how to work in large groups of 9 people. Furthermore, we were all unfamiliar with each other except the people we knew in our sub-groups. It was interesting to see how diverse our team is for each sub-group to come from different educational backgrounds consisting of 3 polytechnic, 3 junior college, and 3 international students.

I was worried at first it might compromise our team dynamics, especially when it comes to the lack of common topic with each other. There are multiple scenarios where we have disagreements with each other. For instance, when we are planning on how to design our prototype, each of us have our own approach to the matter. However, it not possible to adopt everyone's idea hence this leads to disagreements and eventually, leads to conflicts. Unlike individual projects, we have the freedom to decide what we want without consider other's opinion.

Hence, this scenario has taught me that we should learn to respect each other opinions and learn to take criticism at times when our opinion is not the most optimal for the project's well-being. All in all, I believe that working in large groups is inevitable in the work force so being exposed to such situations in school can be a great way to gain exposure and understand how to tackle such situations in the near future.