IM3080 Design and Innovation Project (AY2022/23 Semester 1)
Individual Report

Name: Ding Man

Group No: 4

Project Title: Tetris

Contributions to the Project (1 page)

Software part of the Tetris (collaborate with Zhang Wei and Zhize):

- All the functions needed for the Tetris game except background music:
    - The shape generation.
    - Overall set up between hardware and software.
    - Shapes' falling; moving left and right; rotation; instant dropping; allocating colors.
    - Clear function and blink-during-clear function.
    - Game over function
    - Score system including current score and highest score.
    - Preview of the next tile.
- Test:
    - Help set up the simulator.
    - Test the code on the simulator.
    - Test the code on the real set-up wires.
- Bug fix

Hardware part of the Tetris:

- Help setting up the tested-version Tetris for the code test

Reflection on Learning Outcome Attainment

Reflect on your experience during your project and the achievements you have relating to at least two of the points below:

(a) Engineering knowledge
(b) Problem Analysis
(c) Investigation
(d) Design/development of Solutions
(e) Modern Tool Usage
(f) The Engineer and Society
(g) Environment and Sustainability
(h) Ethics
(i) Individual and Team Work
(j) Communication
(k) Project Management and Finance
(l) Lifelong Learning

Point 1: _(a)_State the area: Arduino

This Tetris project is fully developed on the Arduino. As a member of software group, we begin with learning how to code on the Arduino and how the Arduino works since it is the first time for me to use Arduino. After getting familiar with Arduino, we begin to write the code for Tetris. In Arduino, all the code is written in C language and basically all the functions are running in a loop. We start with the basic set-up part for the game and simulate it on the tinker cad (an online platform for the circuit simulation). After the set-up part, we summarize all the functions needed for the game and we realized that how Arduino works it totally different from the way we write the code conventionally. So, we code it from simple functions to difficult functions. The core of writing the codes is to know how to control each separated wires together since we have ten wires connected to different pins. After we find the right way to control and code, we then realize the functions one by one.
Through 13-weeks practice, I know how the whole game works, how to write Arduino code, how to connect Arduino segments and how a whole project is completed.

Point 2: _(d)__State the area: develop Tetris code

When we were writing the code, we didn't have any reference. Therefore, all the code were written from zero. We looked through the java code of Tetris, but it is so different since how Arduino works is different, and we need to write the code in C which is not an object-oriented language. Our software group always worked together. If we encountered a problem, we started with the problem analysis and then to found out the way step by step and finally wrote the solutions in C. After the code ran well, we will try to find ways to improve it or tidy it up.
When we tested the code, firstly we tested it on the simulator, however, as our code became longer and longer, the simulator space was not enough, and the real Tetris set-up has not been done, we then learned to test code part by part and learnt and found ways to debug our codes.

Point 3:(u) State the area: Individual and group work

This is the first project I have ever done in such a big group. In the beginning, I felt stressed and worried about how the whole project will go on. However, our group leader divide the project into 3 parts just at the beginning – software group, hardware group and design group. Each group then have their small task for each sub-group which let everyone has their own tasks and focus on their own part. After each group almost finished their part, we combined our work together and everything worked smoothly, and I also have an overall idea on how a real project is developed. I could apply what I learnt in this course in the future.

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