

# **IM3080 Design and Innovation Project (AY2023/24 Semester 1)**

## **Individual Report**

Name: Angel Low Shu Hui

Group No: 3

Project Title: nIEMtendo

### **Contributions to the Project (1 page)**

- Research on interactive light displays and proposed conceptual ideas
- Collaborated with Heidi in the development of Snake Game A
  - Rendering a dynamically moving snake
  - Generating random apple
  - Implementation of gameplay functionalities such as start game and game over
  - Increasing speed of snake when snake grows after eating apple
- Developed the full Snake Game B
  - Rendering a static 3-LED length moving snake (does not increase speed)
  - Rendering multiple random apples
  - Implementation of gameplay functionalities such as start game and game over
  - Losing conditions
  - Count-up Timer using millis()
- Collaborated with Samuel for end-game Snake Game B features
  - Rendering different coloured apples
  - Solving linked list problems that changes indexing of coloured apples when an apple is eaten
  - Choosing next target apple color
  - Winning conditions
- Implemented high scores for Snake Game A and B on the small display screen using EEPROM.h library
  - Storage and retrieval of high scores from Arduino's memory
  - Writing conditions for setting highscores
  - Writing conditions for when the small display screen will display high scores
  - Reset high score functions (for maintenance)
- Displaying of Count-Up timer, highscores, next target apple color on small display screens (highscore/timer, score/color) using adafruit library
- Assisted in testing and debugging of combined code
- Created presentation slides, writing of final report and creation of final poster

## **Reflection on Learning Outcome Attainment**

### **Point 1: Problem Analysis**

Throughout the project, coding the snake game presented many challenges, especially when putting all the codes together. Dealing with the game's speed and figuring out specific lines causing issues were common problems that didn't have quick solutions. To overcome these challenges, we needed to carefully examine the code and collaborate on debugging. This experience significantly improved my ability to analyze problems. Initially, I tended to apply quick fixes without fully understanding the problem. However, with insights from more experienced team members, I have learned to take a more systematic approach. The project taught me the importance of identifying the root cause of an issue for effective debugging. This skill not only saved time but also gave me confidence in navigating through more extensive codebases.

### **Point 2: Individual and Team Work**

Embarking on a project within a large 10-member group brought about challenges in role delegation, leading to the formation of sub-teams. Initially, I found myself closely collaborating with another team member on the same code, realizing its inefficiency. In response, we chose to divide our tasks, working individually and reuniting during the code integration phase. This experience underscored the delicate balance between individual and team efforts, emphasizing the importance of independent work before presenting collective contributions. Navigating this significant group setting helped me understand my preferred working style better. I discovered that I thrive in environments that blend individual and teamwork, recognizing the unique strengths each approach brings. Individual work offers the needed time for thoughtful reflection, enabling research on unfamiliar topics. This groundwork, coupled with prior thought, enhances my ability to contribute meaningful insights and opinions during team meetings. Confronting my weakness in hardware understanding, I proactively sought guidance from knowledgeable team members over weeks, significantly advancing my comprehension of coding with hardware. This collaborative learning approach not only deepened my understanding of our project but also provided invaluable learning opportunities from other team members, fostering a culture of mutual growth and shared expertise.

### **Point 3: Engineering Knowledge**

At the beginning of the project, I did not have any experience with Arduino or much knowledge about hardware parts. It was challenging, and I struggled to understand how to code for both hardware and software. Over time, I successfully overcame these challenges, and I attribute my accomplishment to the helpfulness of my teammates. Their willingness to answer my questions allowed me to program the games and incorporate additional features that I had not initially thought I could handle. Initially hesitant about taking on an interactive project due to my lack of prior experience, I now feel proud and have no regrets about choosing this path. Grateful for my group mates' constant support and mutual learning, I have gained new skills and knowledge in real-world hardware applications. This project has taught me that with effort and a willingness to learn, one can achieve anything. The time and energy invested in the project have indeed paid off.