305 Project Team 19 – Interim Report

Sai Kiran N Kamat, Charanjeet Santhanam Viswanathan, Vihan Dishawal

Game Strategy

In Flappy Bird, players control a bird by clicking the mouse, causing it to flap its wings and ascend. The objective is to navigate through a series of pipes without colliding with them or the ground. Each successful manoeuvre earns points, while any collision results in losing a life. Extra lives pop up on occasion and can be collected, when the player loses their last life the game ends. The game gradually increases difficulty after a certain score is achieved when in normal mode, which may make gaps smaller, the bird faster and invert colours to increase achieve the same. Additionally, there will be power ups that will temporarily grant the player special abilities to help progress in the game.

Design Specifications

The game will run on the DCE0V board, with a clock cycle of 25MHz provided by the PLL component. It will register inputs from a PS2 mouse peripheral, the Push Buttons, and DIP switches present on the board itself. It will output the current score on the seven-segment of the board and display the game through a VGA output. The VGA output dimensions are a 640 x 480 pixel, 60Hz output.

The game will consist of 4 main states as shown in the State Diagram in the document, with 3 sub states or "levels" for normal mode.

Plan

Our current development goal is expanding the game's features along with basic yet robust functionality. We have already implemented essential components such as the bird, pipes, ground, and background. Moving forward, our plan involves:

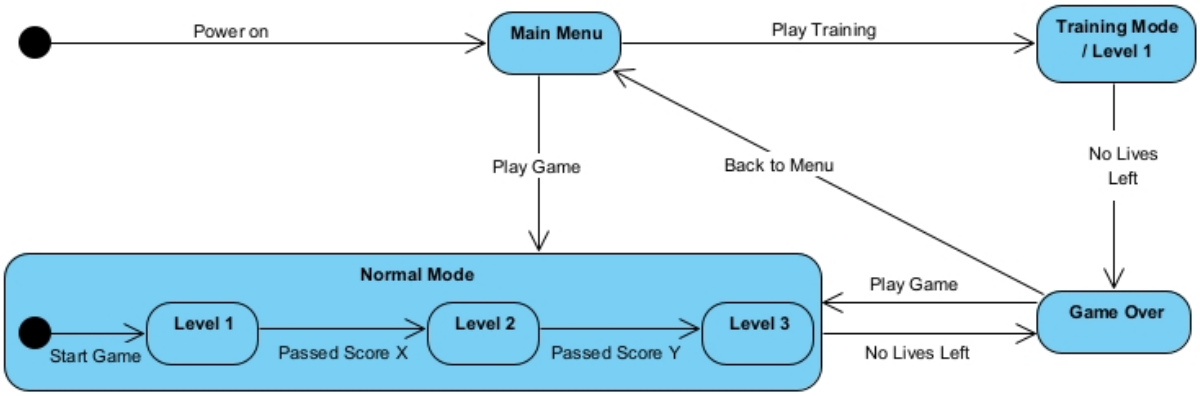
- Integrating a scoring system that tracks the player's progress in the game and displays it on the seven-segment display.

- Game Modes and Levels: Developing different game modes and progressing difficulty to provide variety and challenge for players. This includes:

    - Level 1 / Training Mode: Begin with the slowest speed and wider gaps, without power-ups or extra lives, to give the player a feel of the game and help them get used to controls.
    - Level 2 (after reaching score X): Increase speed of pipes and introduce extra lives.
    - Level 3 (after reaching score Y): Maximise speed of pipes, keep extra lives, introduce colour inversion and power ups.

- Main Menu and Game Over Screens: Designing the main menu, allowing players to navigate between game modes. Similarly, creating a ‘Game Over’ screen that displays once the player loses all lives, while displaying the final score and provide options for replaying or returning to the main menu.

High Level State Diagram



Block Diagram