

ELEC 3040/3050 Alternate Final Project

Specification – Fall 2017

Implement a simple video game demonstrating mastery of the STM32L100RC Discovery Board and simple C programming constructs.

Specifications

- Full credit is 25 points (requirements are a-e)
- The extra credit (option f) is worth 20% more, or 5 points.

Points	Requirements
5	a) The player must control a character on the LED matrix display. The character can be any shape or size and react in any designed way. The only requirement is that each key press generates a unique response based on the key pressed.
5	b) The player must hear some form of auditory feedback when a key is pressed. This may be in the form of a song that plays at a designated point during gameplay or a short beep upon each key press.
5	c) There must be some form of randomly generated enemy or conflict. This may take any form the designer chooses. The object of the game should be to interact with this conflict character in some specified way.
5	d) There must be a specified start and end state for the game. Upon the arrival of the player at the end state (think of a Game Over), the game should only be able to be played again when the RESET key is pressed.
5	e) There must be a recorded score element to the game. This may take any form the designer chooses, but it must be displayed for the player to see in the game's end state.
5	f) EXTRA CREDIT (20% more): The game must meet requirements a-e and have some form of scaled difficulty. This can take any form the designer chooses, but must be apparent to the player in some form.

Example Game

A simple game to implement that meets the specifications for this project is a dodging game. Enemy characters randomly spawn on the top row of the LED matrix and fall toward the player character at a constant rate. The player's score will increment once for every character avoided. Should the player character collide with an enemy character, the game will cease and display the total score on the LED matrix or GPIO pins in binary format. To scale the difficulty, more enemy characters can spawn at once or the speed of the enemy characters can increase as the player's score increases.

Notes

- Requirement (a) means that the LED matrix and keypad interface must work.
- Requirement (b) means that a PWM signal can be controlled with timer interrupts.
- Requirement (c) means that random number generation must work.
- Requirement (d) means that a state machine has been implemented with unique conditions for transitioning between states.
- Requirement (e) means that there is an objective and a quantified system for identifying and rewarding player input and performance.
- Option (f) means that feedback of player performance has been implemented within the state machine.