CS/EE120B
Project: Lab 10
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Battle Monster

High level Description:

In this game, the UserInterface SM interfaces the menu in LCD screen, and is the master task of other SMs. By accessing the new monster menu in UserInterface SM, UserInterface SM sets write flag to 1 which enables the dataWrite SM. Then, the UserInterface SM waits for writebusy to be 0 which is to be toggled by dataWrite SM once the writing data to EEPROM is done. By accessing battle menu in UserInterface SM, the GameOn flag is set to 1 to start the timer in PlayerTimer SM. PlayerTimer SM sets pl1_go flag to 1, and pl2_go flag to 0 for the number of seconds which is to be set depending on the defense of the monster. When the number of seconds has passed, PlayerTimer SM sets pl2_go flag to 0, and pl1_go flag to 1. When pl1_go flag is set to 1, the MonsterMove SM waits for the user to press keypad to execute the animation of the monster attack moves. When pl2_go is set to 1, SwitchWeapon SM, KnifeStab SM, and GunShoot SM wait for the user to press the button. When button B2 is pressed, the sw_knife flag is set to 1 to enable the KnifeStab SM, and the KnifeStab SM waits for user to press the button on B1 to execute stabbing motion. When button B2 is pressed again, the sw_gun flag is set to 1 to enable the GunShoot SM, and the GunShoot SM waits for user to press the button on B0 to execute shooting motion.

User Guide

In the menu displayed by LCD Screen, the user can access monster menu by pressing A in the main menu. In the monster menu, the user can choose to create new monster in either slotA, slotB, or slotC. Then, the user can choose the monster: Red Ghost and Bald Ogre. The user can access the monster storage menu to check out the saved monster in either slot A, B or C, and the monster's attributes.

In the battle mode, the game involves two players. Player 1 plays the monster, and player 1 can chose the move 1 or move 2 by pressing A or B once to damage the player2. Player 2 plays human, and player 2 has to button mash knife button(B1) or gun button(B0) as many as they can in order to damage the player 1. The user can switch weapon to knife or gun by pressing B2 button. Whoever depletes the opposing player's health points to 0 or less wins the game.

I/Os and Components

PORTA(output)	PORTB	PORTC	PORTD(output)
PA0 –DS pin on shift register(for LED matrix color cathode)	B0 (input) – gun button	Keypad rowpin1	D0-LCD datapin 0
PA1–STCP(load) pin On shift register(for LED matrix color cathode)	B1(input) – knife button	Keypad rowpin2	D1- LCD datapin 1
PA2 –SHCP(shift)pin On shift register(for LED matrix color cathode)	B2(input) – switch weapon button	Keypad rowpin3	D2- LCD datapin 2
PA3 – DS pin On shift register(on LED matrix)	N/A	Keypad rowpin4	D3- LCD datapin 3
PA4- STCP On shift register(for LED matrix common anode)	N/A	Keypad column pin1(output)	D4- LCD datapin 4
PA5 - SHCP on shift register(for LED matrix common anode)	N/A	Keypad column pin2(output)	D5- LCD datapin 5
PA6 –LCD E pin	B6(output)-player1 flag LED	Keypad column pin3(output)	D6- LCD datapin 6
PA7 –LCD RS pin	B7(output)-player 2 flag LED	Keypad column pin4(output)	D7- LCD datapin 7

Links

battle.h: contains state machines that are responsible for switching weapon, knife stabbing motion, Player Timer
https://drive.google.com/file/d/0B6VHLTQIbu45SW02ZE9KWThDaVU/edit?usp=sharing
monster.h: contains SM that makes monsters move.
https://drive.google.com/file/d/0B6VHLTQIbu45a0N5TUE3YWVyVTA/edit?usp=sharing
mndata.h: contains struct mndata which has 7 elements representing the monster's attributes.
https://drive.google.com/file/d/0B6VHLTQIbu45djV6NFBTVGszYm8/edit?usp=sharing
color.h: contains functions that transmits data to color cathode rows and common anode columns of the LED matrix, and SM tick function that displays the image on LED matrix.
https://drive.google.com/file/d/0B6VHLTQIbu45V2dLRDJqa0ExaXc/edit?usp=sharing
youtube video: https://www.youtube.com/watch?v=u9gR_AFQUtI&feature=youtu.be