Lab 5

CSE 379 LLB - Introduction to Microprocessors

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Lab Section: R4

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Division of Work

Yicheng Luo (yluo25):

Writing uart_interrupt, gpio_interrupt_init, documentation.

Xiudong (xliu243):

Writing UART0_Handler, Switch_Handler, documentation.

Program Overview

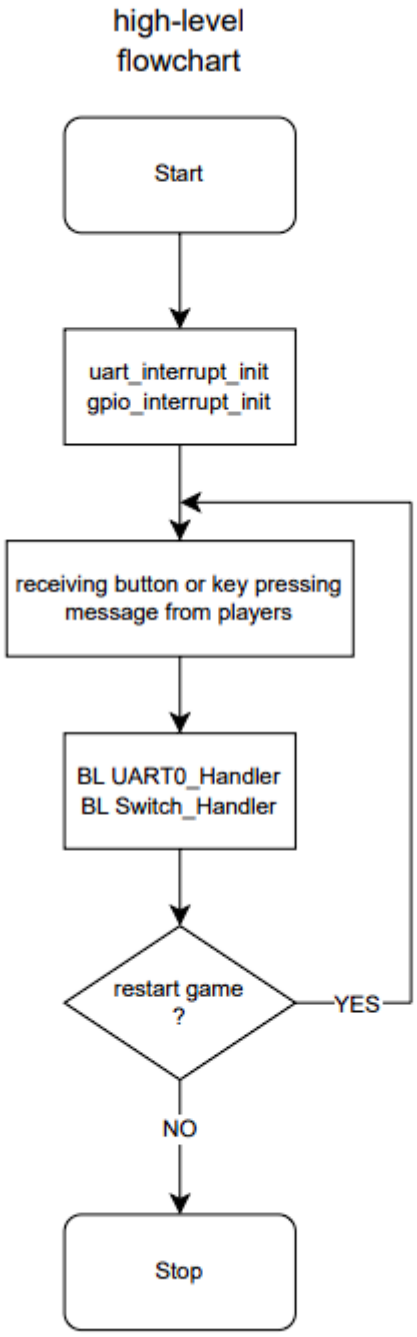
Program Overview:

1. Start running the program
2. Following the instructions displayed on PuTTY
3. Once the instruction: “Ready……, Now” is displayed on PuTTY, both players need to press the SW1 on the Tiva-C board and Space key on the keyboard respectively at the same time to try their best.
4. If either player presses their related key or button too early, which means before the instruction: “Now”, the game will be ended. The players can press the Enter key on the keyboard to restart or not.
5. If none of the players presses the button or key too early, the game will continue and the player who presses the button or key early will receive one point.
6. The game will begin again and repeat the steps 3-5 until one of the players receives three points at first, the game will end. The players can press the Enter key on the keyboard to play the game again or not.

Program Summary:

In this lab, we utilize the sw1 button on the Tiva-C board and Space key on the keyboard to build a small reflex game. We will implement uart_interrupt_init and gpio_interrupt_init to initialize the sw1 button and Space key, and implement Switch_Handler and UART0_Handler to receive whether the player presses the sw1 button or space key. After receiving the pressing message, we will implement a loop to utilize all functions to build the small reflex game.

High Level Flowchart:



Subroutine Descriptions

Describe Each Subroutine

UART0_Handler

What does it do: clear, store, and return the interrupt which is generated by gpio_interrupt_init

Arguments: the interrupt generated by gpio_interrupt_init

Return Values: the interrupt(the message that SW1 button is pressed or not.)

Switch_Handler

What does it do: clear, store, and return the interrupt which is generated by uart_interrupt_init

Arguments: interrupt generated by uart_interrupt_init

Return Values: the interrupt(the message that Space key is pressed or not.)

uart_interrupt_init

What does it do: it will generate an interrupt when the Space key on the keyboard is pressed by the user in PuTTy (UART0)

Arguments: UART, RXIM

Return Values: the generated interrupt

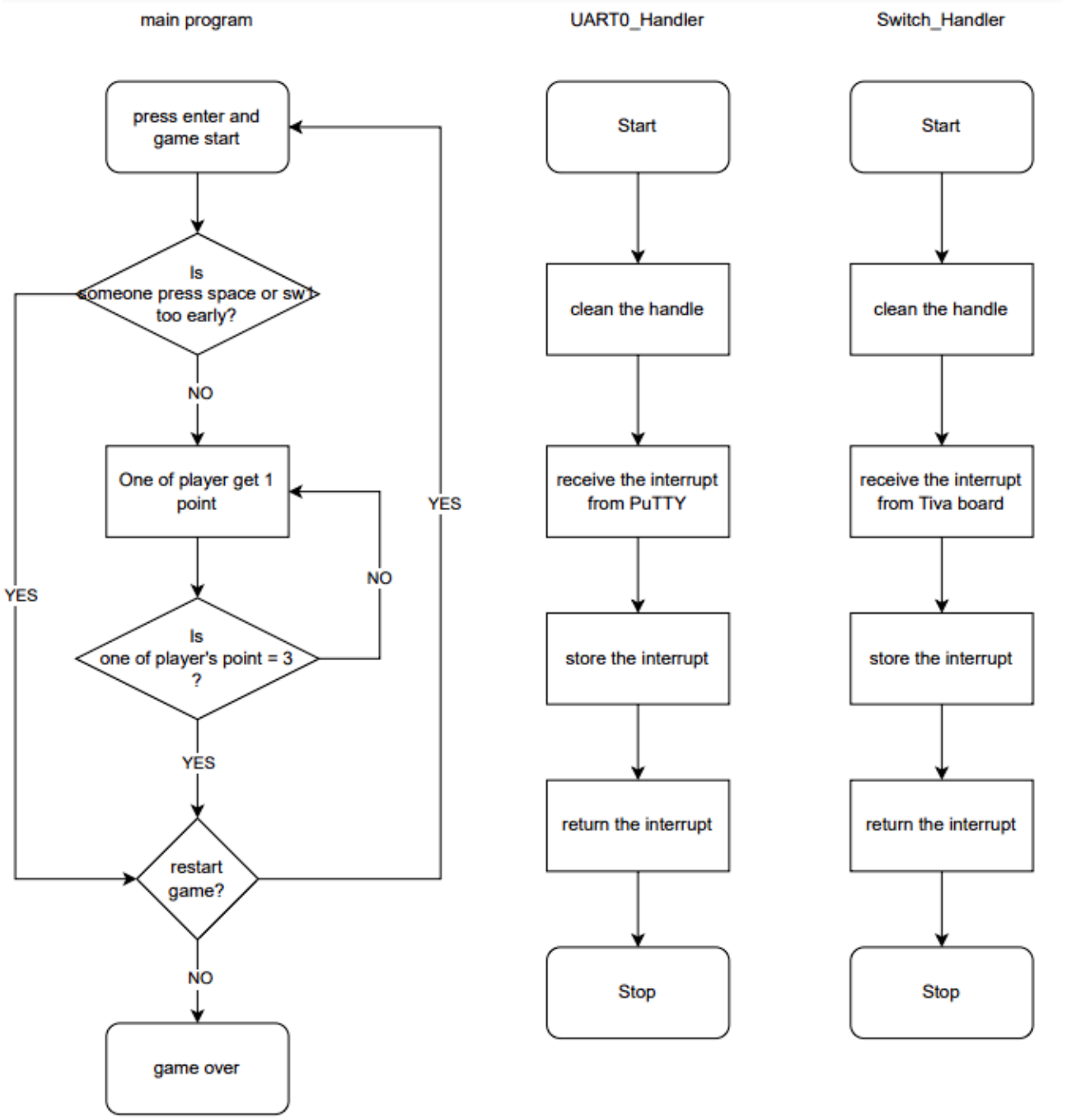
gpio_interrupt_init

What does it do: it will generate an interrupt when the SW1 button on the Tiva board is pressed.

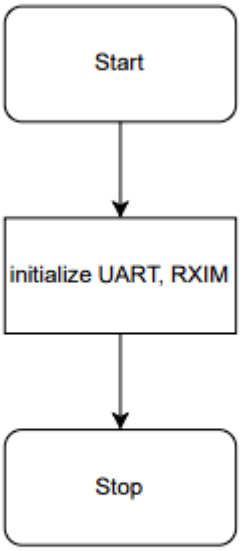
Arguments: F GPIO Port F Base Address, GPIOIS Offset, SW1 Pin

Return Values: the generated interrupt

Subroutine Flowcharts



uart_interrupt_init



gpio_interrupt_init