COMP 2659 Course Project – Stage 10a: Completing the Mouse-Driven Splash Screen

Released: Monday, March 25, 2019
Target Completion Date: Friday, April 5, 2019 (at the latest)

Overview

In an earlier stage you should already have completed a splash screen with a keyboard-driven main menu. You will now revise this menu so that it is mouse-driven.

Requirement: Splash Screen with Mouse-Driven Main Menu

You must provide a welcome splash screen which provides a main menu. At start-up, this allows the user to select between "1 player" and "quit" options at a minimum. Later, the splash screen will include a "2 player" option. When the game is over, the program may optionally return to this menu.

Display each menu option as a rectangular button. The user must be able to select an option by left-clicking within the corresponding rectangle.

When the splash screen is active, the program must maintain a mouse pointer plotted at an appropriate screen location, based on the user's mouse movement activity. The mouse pointer must not be visible during game play. When visible, the pointer must not flicker or tear.

The main menu must not be handled by the main game loop. Instead, the program's `main` function must call one function for handling the splash screen, and then a second function for handling the game itself. The latter function must contain the main game loop.

Time permitting, you may also wish to display a background image, high score list, etc. on this screen. But, these are not core features of the project.

Guidance: Mouse Input and Pointer Plotting

If the IKBD ISR from stage 9b is fully and correctly implemented, the ISR should already be reading (and discarding) mouse packets. So that the program can keep track of the mouse's absolute screen location, maintain global x and y integer variables. Within the ISR add the Δx and Δy from each mouse packet to the global x and y variables. Similarly, a global variable can be used for maintaining mouse button state as obtained from each mouse button's header byte. The splash screen handling function, after plotting the menu, can continuously poll the button state. At each down-click, the mouse position can be consulted to determine which menu option was selected (if any).

Two approaches may be considered for plotting a solid (non-flickering or tearing) mouse pointer. The first is to use double-buffering, which may be overkill. The second is to single-buffer the splash screen, and to very quickly plot the mouse pointer inside the VBL ISR[1].

When the mouse pointer has moved, it will be necessary to un-plot at the former location and to re-plot at the new location. One simple approach is to perform an XOR operation for both plotting and un-plotting. Alternatively, a "back fill" bitmap, of the same dimensions as the mouse pointer bitmap, can be

[1] Remember, the VBL ISR runs in response to a vertical blank – the brief period of time between screen refreshes. If the plotting operation is completed quickly enough, the entire mouse pointer bitmap will have been plotted before the next screen refresh begins.

maintained. It is used to hold a copy of the frame buffer region currently obscured by the pointer. When the pointer moves on, the uncovered region can be restored. Of course, a newly obscured region must be saved for later back filling.