1. The VGA program uses the VGA driver and a subroutine “draw_test_screen” to print an image with words “Hello World!” on it. The main logic of the program is easy thanks to the reasonable use of subroutines. The driver contains four methods which can draw a point, draw a character and to clear pixel or character buffer. Draw pixel and write character functions are relatively easy as they reads in the arguments and set the corresponding memory address to “draw” on the VGA screen. The clear buffer methods uses recursive approach to move in the memory addresses that are responsible for storing the pixel data and set them to 0x00000000 to use black pixel to clear the screen.
2. The PS2 program uses a PS2 driver, VGA driver and other subroutines to consistently read the user’s keyboard input and print the make or break codes of the inputted alphabets onto the VGA screen. The PS2 driver first read the RVALID bit from the designated memory address to check if the PS2 data register is representing a new value from the keyboard, then it writes its content to the memory address given if the RVALID bit is 1.
3. The flag gallery program implements a flag gallery that allows the user to switch between different flags on the VGA screen by pressing A and D keys. It uses the VGA driver, PS2 driver and custom flag-drawing subroutines to achieve such functionalities. The PS2 driver constantly reads the user’s input (in this case only A or Ds) and then controls the VGA drivers to draw the given flags by using custom flag-drawing subroutines.