The purpose of this assignment is to work with simple GPIO ports and to get a project to run on the STM32F4-Discovery board, using information from the previous assignment. This project is to be programmed into the flash memory of the microcontroller by the debugger. Therefore, the default memory map of the target microcontroller is to be used (ROM starting at 0x080000000 and SRAM starting at 0x20000000).

It is suggested that you build the project in two steps.

**Step 1 – Blinking LED**

Write a program that continuously blinks the blue LED ON and OFF with a frequency of 2 seconds – ON for one second and OFF for one second. Implement this with a main program and three subroutines.

- **Subroutine 1** (InitLED) - Initialize I/O ports and LED state.
- **Subroutine 2** (LEDonoff) – Turn the LED ON or OFF, according to a parameter passed to the subroutine in register R0.
- **Subroutine 3** (Delay) – Implement a one-second time delay (i.e. “do nothing” for one second.)
- **Main Program** – Call the three subroutines to produce the behavior described in the problem statement.

**Step 2 – Button-controlled blinking LED**

Modify the program from Step 1 so that the LED state is “frozen” at its current state (ON or OFF) if the user button is being held down, and then continues blinking when the button is released. Add two additional subroutines.

- **Subroutine 4** (InitButton) – Initialize the I/O port pin connected to the User button.
- **Subroutine 5** (CheckButton) – Check the state of the user button and return 1 in register R0 if the button is pressed or 0 if the button is not pressed.

**Deliverables:**

1. Submit a printout of the source program in class.

2. Bring your board to my office some time on Wednesday to demonstrate the operation of the program. I will connect it to my computer to power the board, which should execute the program in its flash memory.