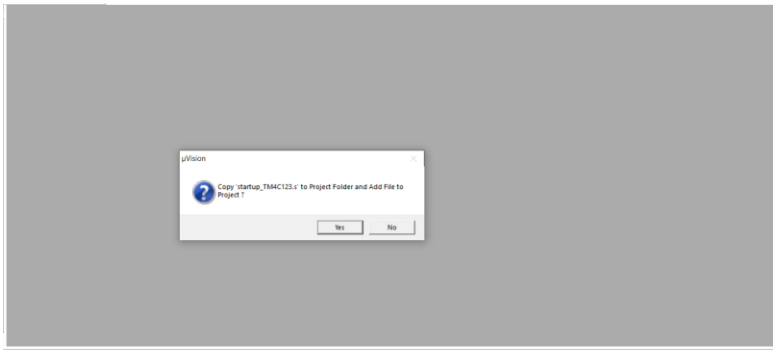
Lab 3

Introduction

To use the simulated ports of TivaC launchpad, follow the below steps:

1. Create new project.
2. Choose the target TM4C123GH6PM device.
3. Copy the start-up code of TM4C123GH6PM.

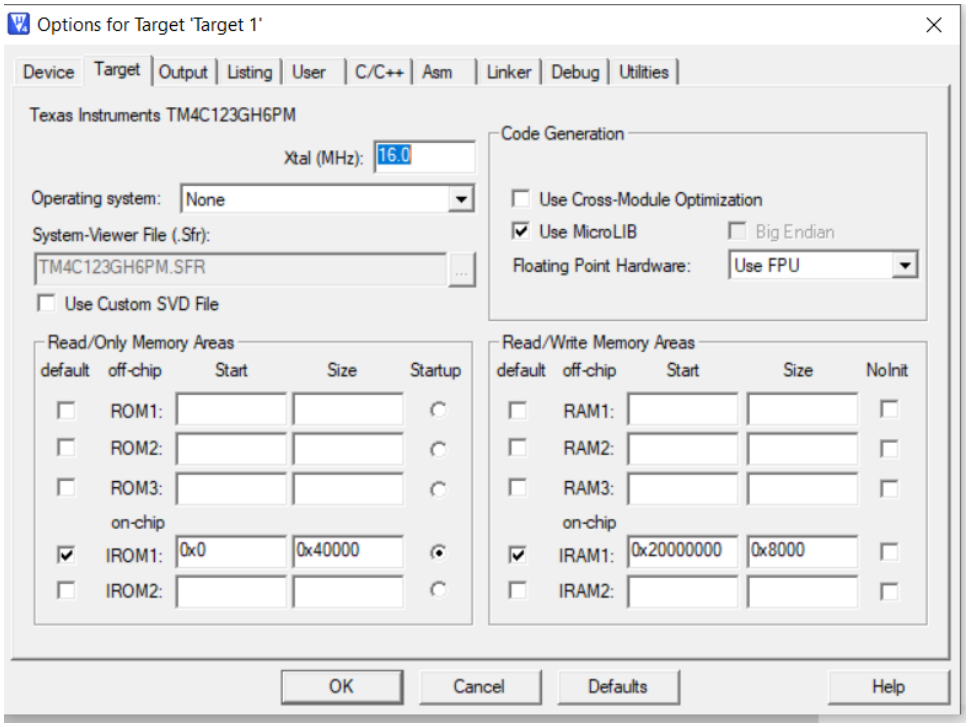


4. Remove instruction “IMPORT SystemInit”

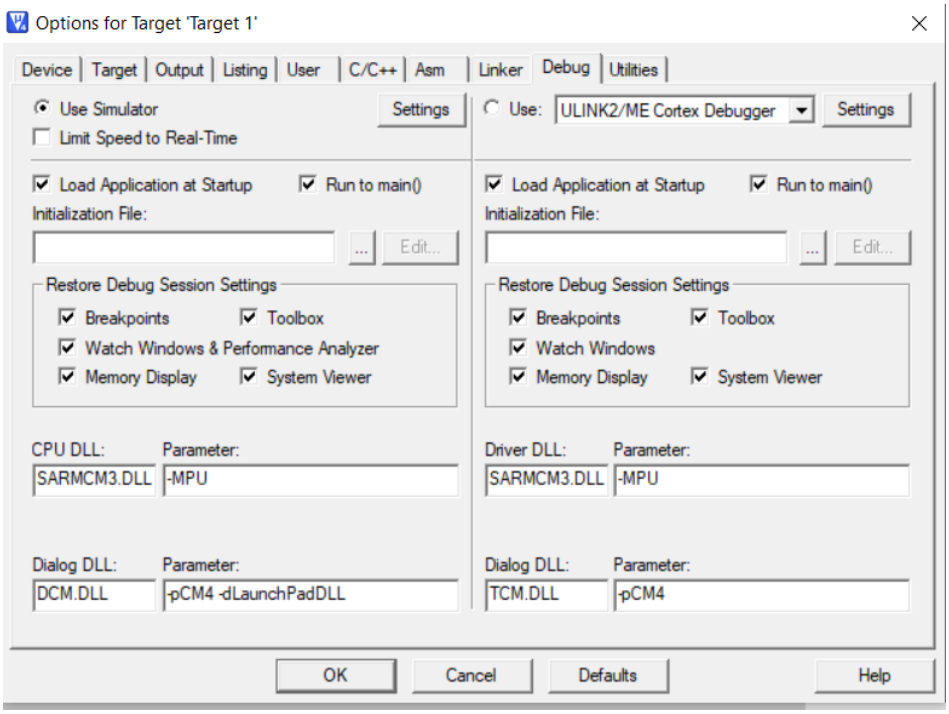
5. Remove instruction “LDR R0, =SystemInit”

6. Remove instruction “BLX R0” at line 236 as shown below

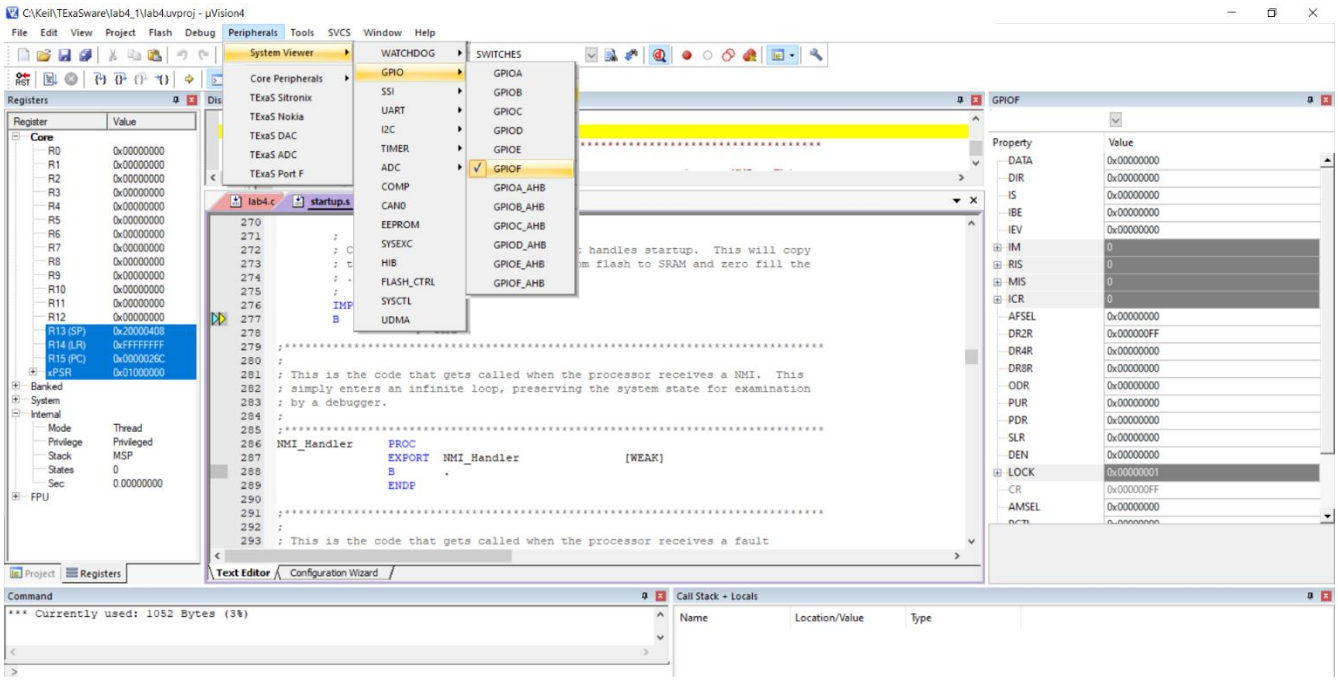
7. Adjust the settings of the target by checking MicroLIB field in Code Generation options.



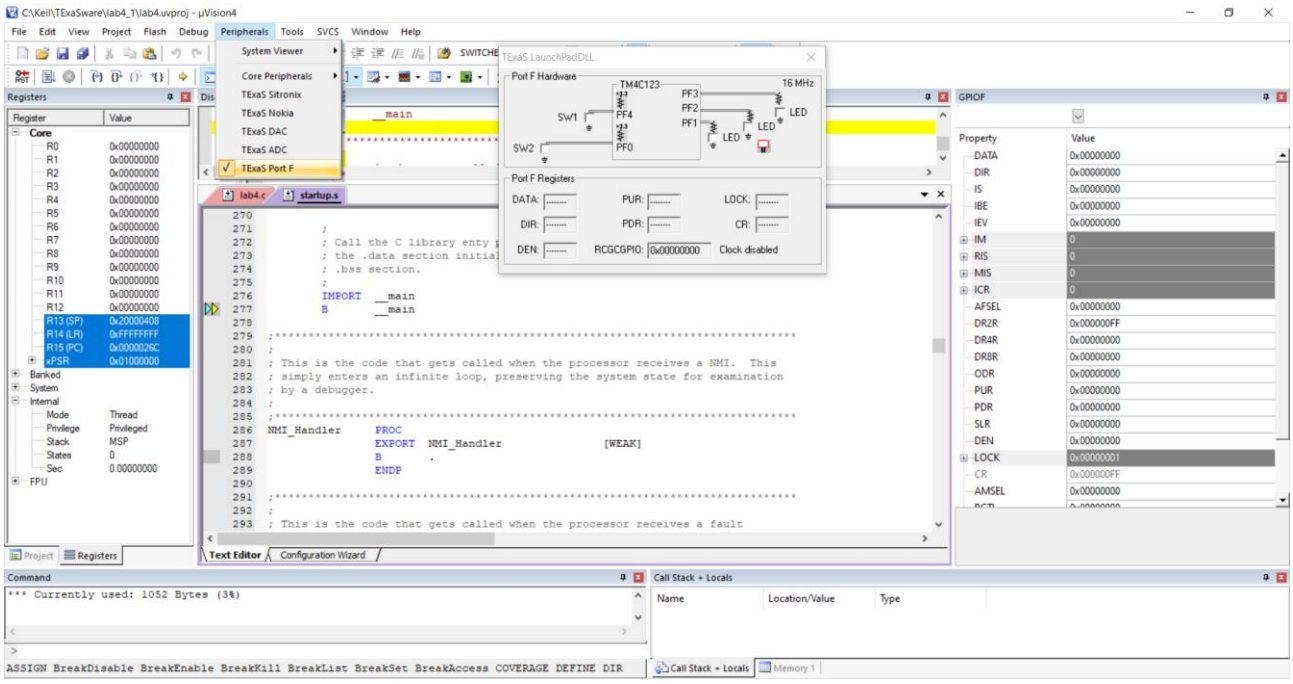
8. Adjust the settings of the target by adding "-dLaunchPadDLL" in Parameter field to support the simulation in Keil 4.



9. You can view the values of the port F through Peripherals in tool bar -> SystemViewer-> GPIO->GPIOF.



10. You can simulate the behavior of switches that are connected to port F in TivaC and check the behavior of the three built-in LEDs in the kit through Peripherals in tool bar -> TExaS PortF.



11. You can then use the simulated kit to check your behavior code in the following lab exercises.

Lab Exercises

Q1. In Tiva C, PF4 is connected to a push button and PF1, PF2, and PF3 are connected to an RGB LED. PF1 is Red, PF2 is Blue, and PF3 is Green.

Write Embedded C application that reads input from the switch and when it is pressed for the first time the Red LED should be turned on then when pressed a second time turn off the Red LED and turn on the Blue LED then when pressed a third time turn off the Blue LED and turn on the Green LED then when pressed a fourth time turn off the Green LED and turn on again the Red LED and then repeat the cycle.

Lab Submission

Q2. TIVAC LaunchPad has two build-in switches SW 1 (PF4) and SW 2(PF0), Three LEDS (Red (PF1), Blue (PF2), Green (PF3)).

- If both switches are pressed, → turn on the Red LED.
- If SW1 is pressed, SW2 is not pressed → turn on the Blue LED.
- SW2 is pressed, SW1 is not pressed → turn on the Green LED.

Check through the simulated Kit that the behavior of your code is correct.

For the lab submission, you should submit a pdf document contains the following.

1. Cover page that contains
    a. your name,
    b. your ID,
    c. your department
2. Place 3 snapshots to show the state of the LEDs in the three mentioned cases above (one snapshot shows when Red LED is turned on, another snapshot shows when Blue LED is turned on, and the third snapshot shows when the Green LED is turned on).
3. The snapshots must show as well the values of the GPIOF registers such as (DATA, DIR, AFSEL, … etc.)
4. Place your code in the document.
5. Your document will be submitted on LMS.