Lab 2 Part 2 – User Defined Pins

Now you have to make use of user-defined pins and wire an external switch and external LED rather than using these components already available on the board.

Get a push button switch , a LED (any color) , a 47 Ω resistor, a 47KΩ resistor, a breadboard and some wires from the lab counter. Note that the longer lead in the LED is positive and the shorter lead is negative. Check whether the LED is functioning by connecting the longer lead to 3.3V/5V and the shorter lead to GND thru a suitable – the Led should light up. If 3.3V is enough to light up (it usually is) the LED do not use 5V pin.

Configure P6.0 as the input pin and wire the switch as active high ( unlike the switches S1 and S2 on the board which are active low). Use the 47KΩ resistor to avoid any shorts when the switch is closed. 5V may be more suitable as input voltage

Configure P6.4 as the output pin and connect the LED to it as active low (unlike the LED1 and LED2 on the board which are active high) thru a 47Ω resistor

Draw wiring diagrams for both switch and LED and get them verified by TA/Instructor before proceeding further. Use 3.3V/5V pins on the board for power supply and any GND pin as ground.

Now just change appropriate lines of code to alter the input and output pins to P6.0 and P6.4 respectively and modify the code to take care of active low/active high changes in the switch and LED.

Add another feature: Display on the terminal a message “LED FLASHING WITH X SECS INTERVAL” where X is the latest input provided thru UART

Add a feature: Add extra lines of code such that the LED flashing will stop when the Switch is pressed

Run the code to show that the external switch and LED work in the same way as the pre-existing ones on the board and get checked off

*Note: Short circuits can happen on a breadboard due to wrong wiring etc. You must avoid short circuits at any cost since they can damage the board. If the green power indicator becomes dim that is a sure indication of a short circuit . The chip will heat up too. If this happens immediately disconnect the USB cable between the board and PC. Using 3.3V rather than 5V may reduce the likelihood of damage to the board.*

*The exact resistor values are not available in the Elegoo kit. The available vales are 10/ 100/220/330 Ω, 1/2/5/10/100 KΩ and 1 MΩ. You have to experiment and find suitable available resistors*