SC1006 Lab3 - Areas to check when encountering issues

1. Check that there is power supply to the equipment
    a. Scope (is USB plugged in)
    b. Arduino (is the USB plugged in)
    c. Bread Board (is the 5V and Ground connected to the Arduino Board's 5V and Ground)

2. Arduino Board code download issue
    a. Is the correct COM port selected on the Arduino Sketch IDE?
    b. Is the TX pin on the Arduino Board connected to any other place other that the probe tip of the oscilloscope probe? Note that the croc clip of the scope probe should only be connected to the ground and not to the Tx pin of the Arduino board.

3. LED not lighted up.
    a. Check if the polarity is correct. The longer leg should be connected to the positive terminal. You can check the LED by connecting the longer leg to 5V and shorter one to Ground (0V). Don't worry if you connect the wrong way, it won't damage the LED.
    b. Check the buttons' connection to the breadboard. Press them down against the breadboard to ensure connection. Default input status is Logic HIGH i.e. 5V for the program code in section 6.3. You should see that on the scope when you probe the button input. When you press the button, the input should be shorted to Ground i.e. 0V. If you see that on the scope, that means the button connection is ok (for the button that you probe).
    c. Check the wires. You can use the LED to verify if the wire is ok or broken. Connect one end of the LED to ground and the other end to 5V via the wire, i.e. GND->(short leg)LED(long leg)->Wire->5V. If the LED light up, the wire is ok.
    d. Use a different 'via' on the breadboard to see if it is due to breadboard 'via' connection issue. Any via in the same column can be used. 'via' refers to the hole on the breadboard.

4. Oscilloscope Probe.
    a. Croc Clip -> Ground
    b. Probe tip -> signal you want to measure, e.g. TX pin, button input etc.

5. UART
    a. Follow the instruction in lab manual for scope setup. Remember to use NORMAL trigger mode and select the correct trigger course (Ch1 or Ch2).
    b. Serial monitor's baud rate setup should be the same as that configured in the program code. If you see the character e.g. 'U' being displayed continuously in the serial monitor, that means the code is executed correctly in the Arduino Board and received correctly by the PC.
    c. If the waveform is not stable or flickering
        i. Check that NORMAL trigger mode is used
        ii. Adjust trigger level to middle of the UART waveform i.e. somewhere around 2.5V (between 0 and 5V).

6. Section 6.3 is for you to get familiarise with the hardware and scope setup, plus the Arduino Sketch operation. Section 6.4 and 6.5 are the main part of Lab3. Proceed to these two sections after 30mins into the lab and don’t stay at 6.3.