

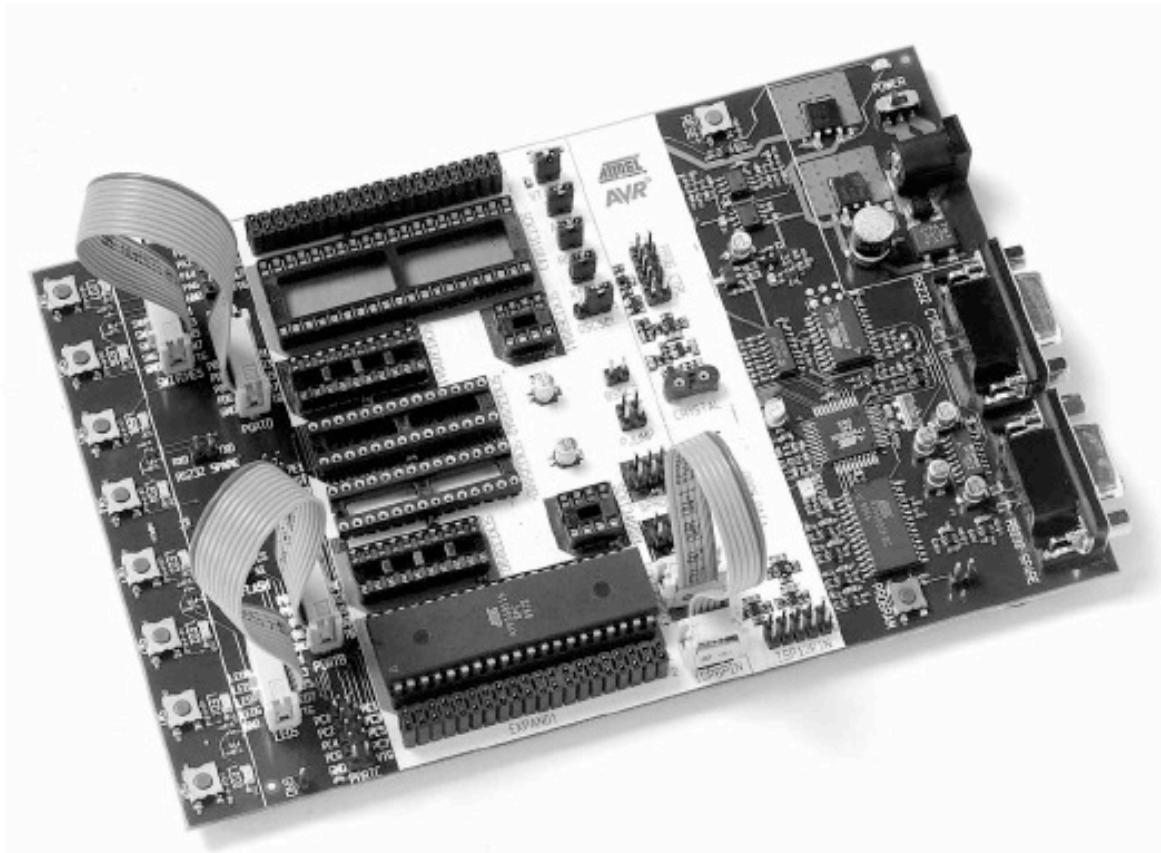
ECE3520 Lab Session 1

Jin Zhang
zhangjin@gwu.edu



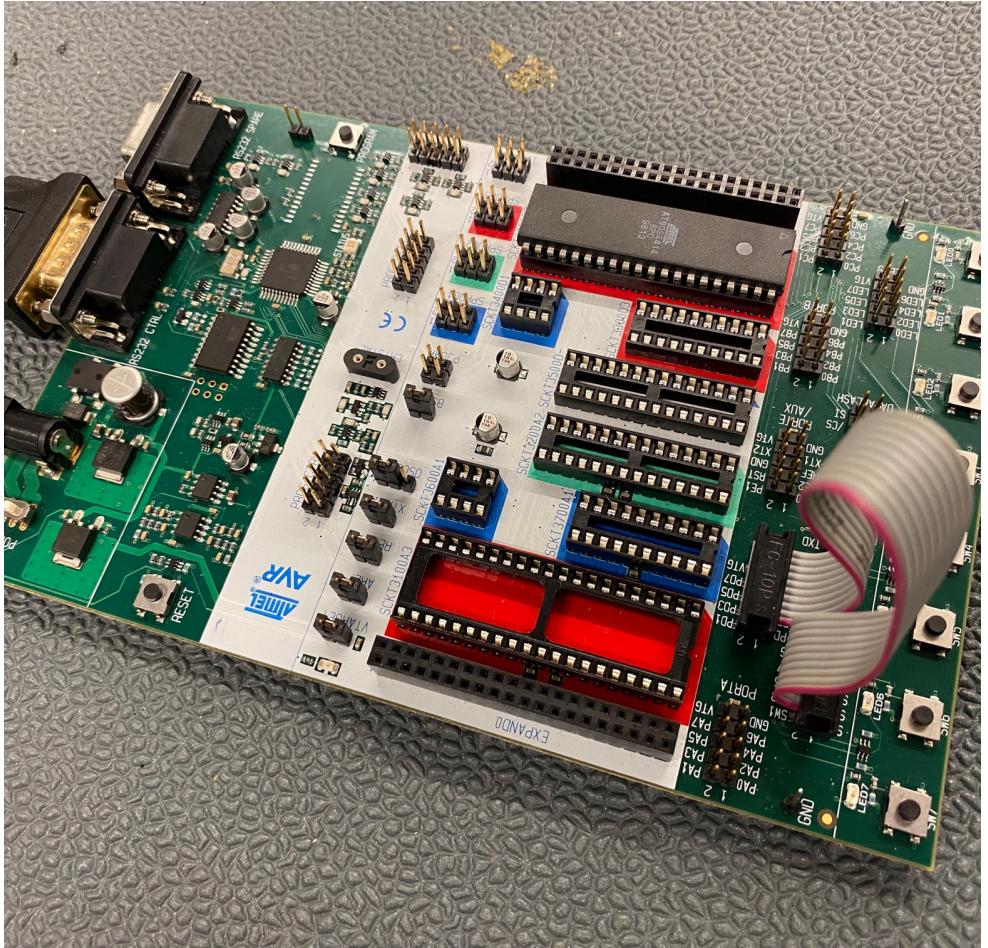
Step-1: Unpack STK500

- Unpack STK500 board and place it so that eight push-button switches are placed in front of you



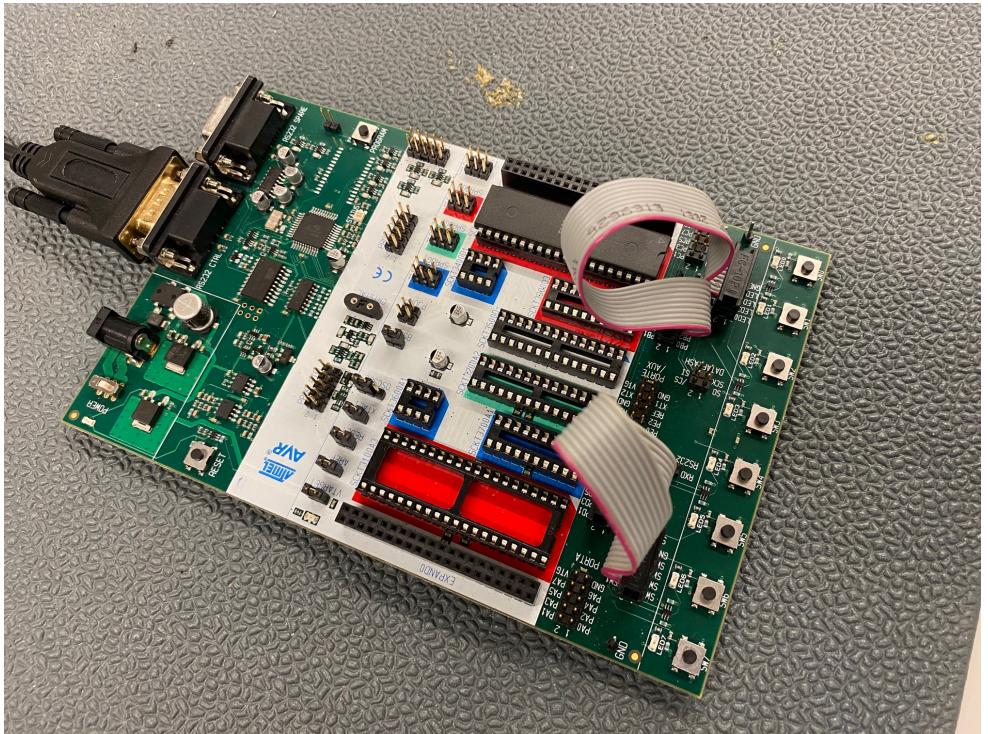
Step-2: Connect Switches

- Using a 10-wire cable, connect switches header to Port D header



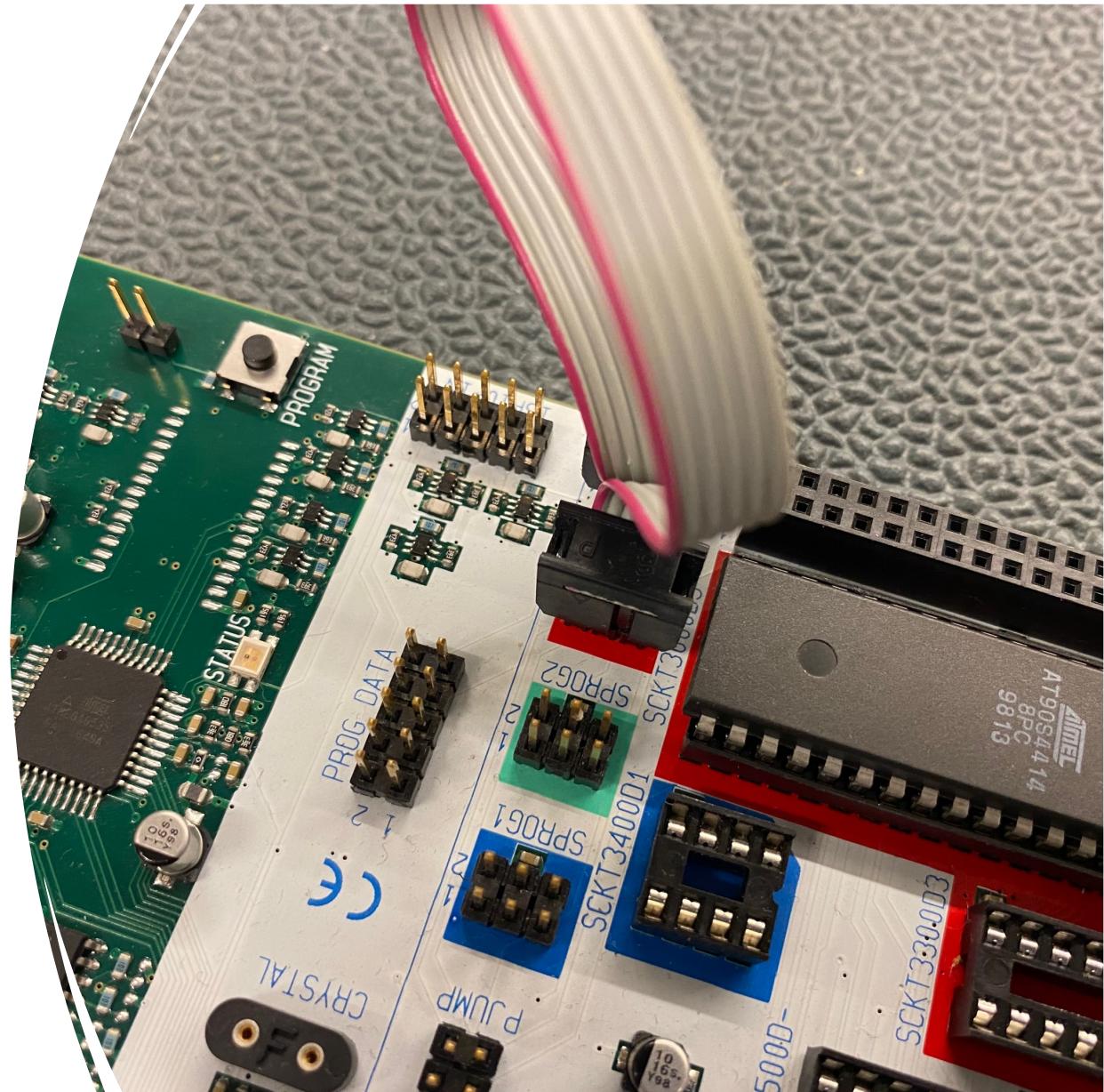
Step-3: Connect LEDs

- Using another 10-wire cable, connect LEDs header to Port B header. Make sure that red stripe is on the pin-1 (LED0 and PB0) side.



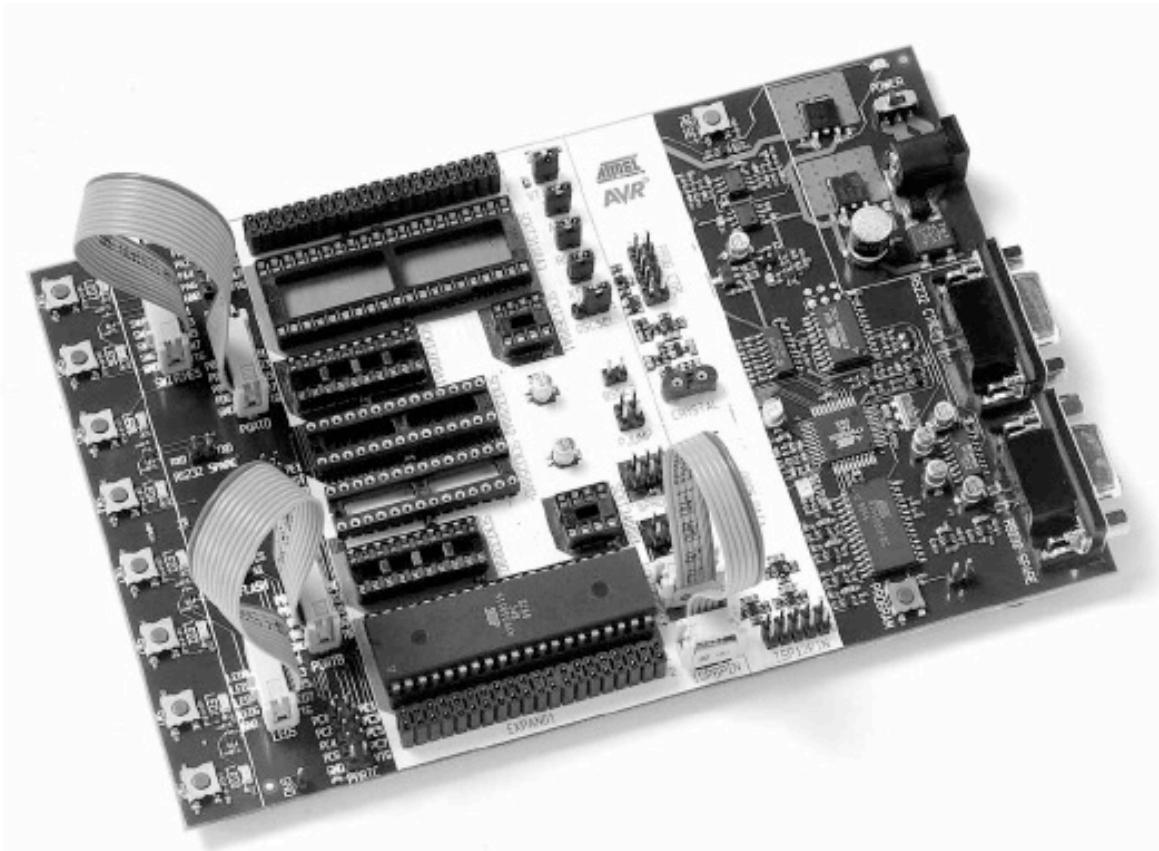
Step-4: Connect 6-Pin ISP

- Using a 6-wire cable, connect 6-pin ISP program header (ISP6PIN) to SPROG3 header. Again, make sure pin-1 side is correctly connected (red stripe).



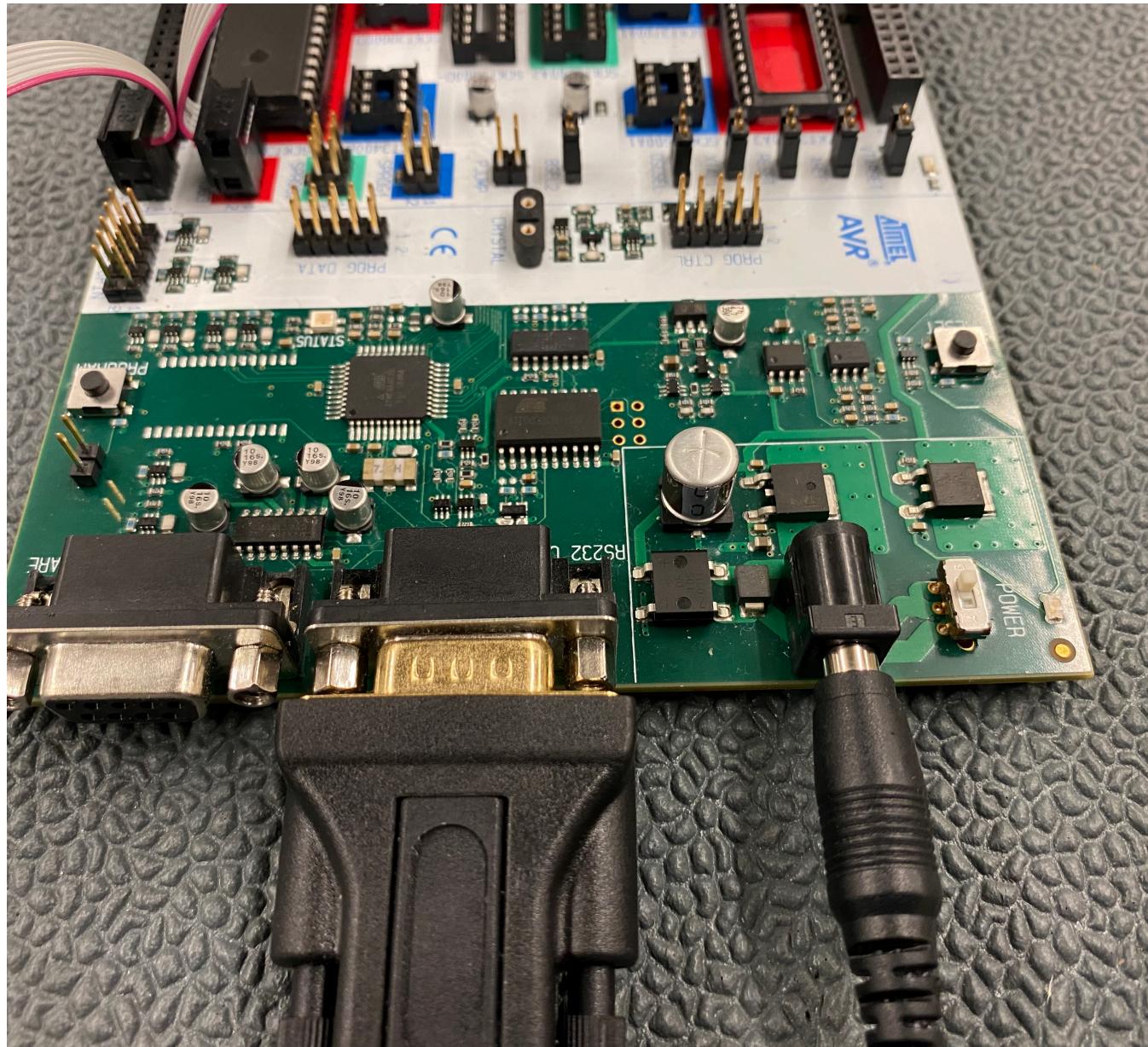
Step-5: Default Setup

- This is the default setup (Switches – Port D, LEDs – Port B, ISP – target uC) we will use in the lab. You may keep these three cables connected.



Step-6: Power Switch On

- Plug in AC power adapter to the power input jack, then plug the adapter to the AC outlet. Now, turn on the power switch on the upper left corner.

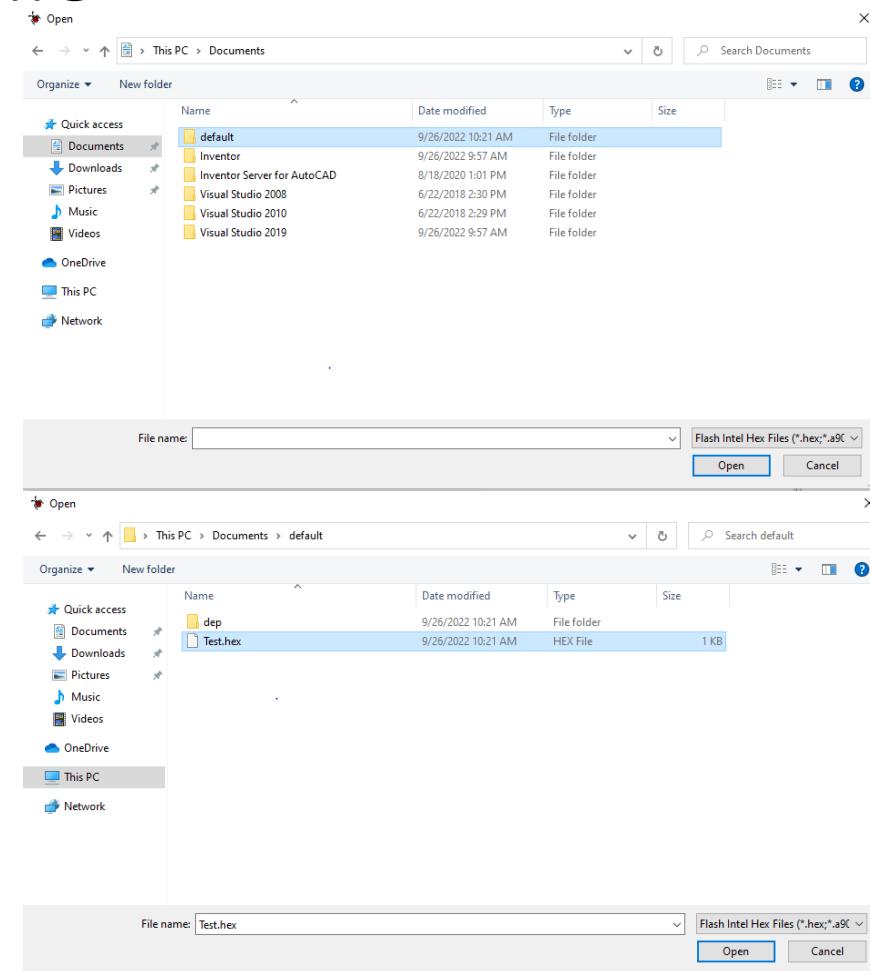
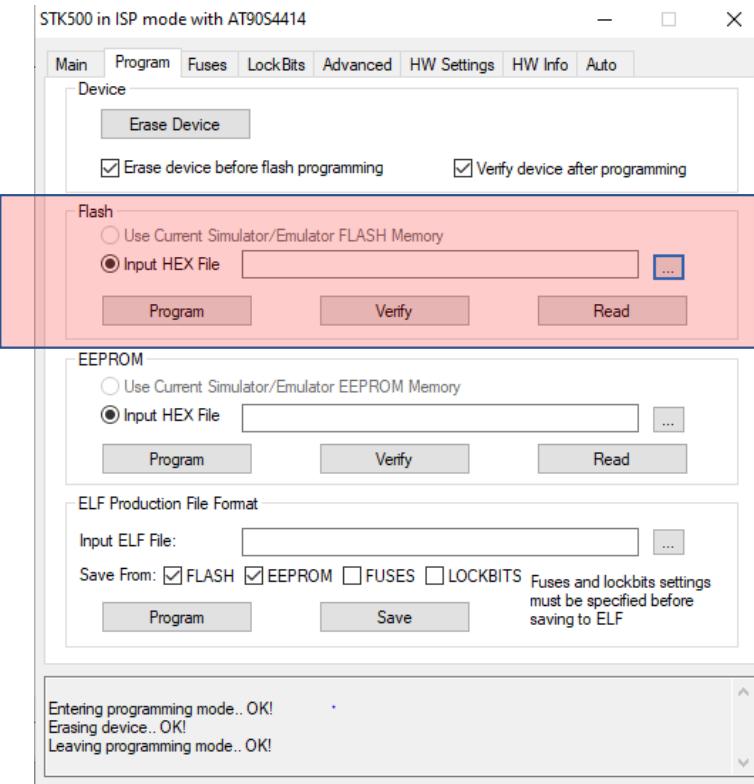


Step-7: Download Hex File

- Please log onto your blackboard and go to the page of electronic reserve to download the hex file name - “MyLEDs_session01.hex”

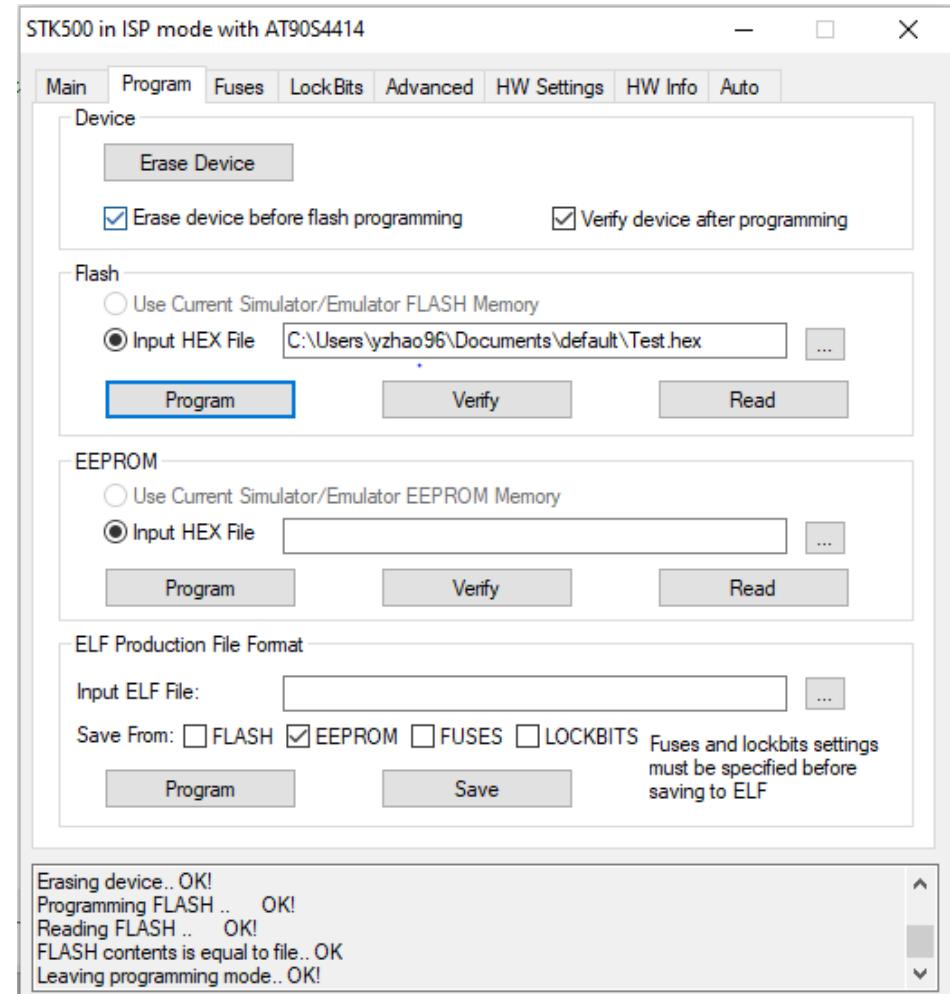
The screenshot shows the Blackboard Ultra interface for the course "202303_Laboratory_ECE_3520_30". The left sidebar displays various course links: Announcements, Syllabus, Outline, Electronic Reserves, Tests, Assignments, Tools, Discussions, and My Grades. The "Electronic Reserves" link is highlighted. The main content area is titled "Electronic Reserves" and shows a file named "MyLEDs_session01.hex" with a download icon.

Step-8: Find the hex file



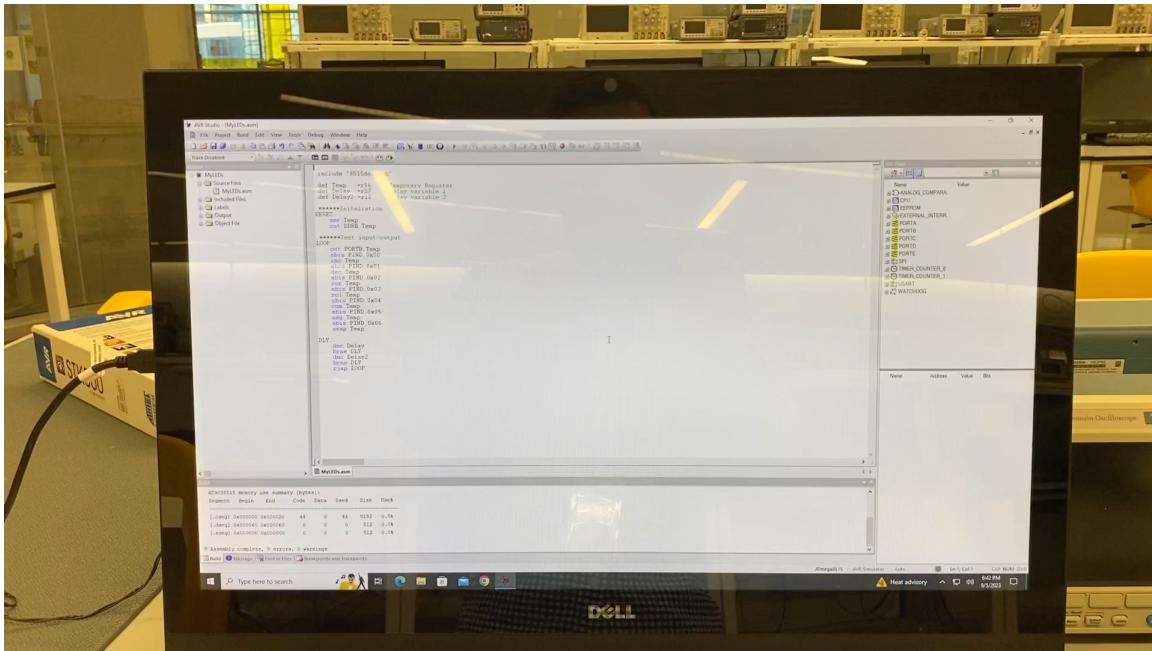
Step-9: Erase Device and Program

- Before downloading the new program to the device, erase it at first to make sure the device is empty.



Step-10: Test and Run

- Press and hold each of eight push-button switches and observe LED patterns. Record lighting sequence of LEDs for different switches (SW0-SW7).



Step-11: Appendix

```
;***** STK500 LEDS and SWITCH demonstration
.include "8515def.inc"

.def Temp    =r16          ; Temporary register
.def Delay   =r17          ; Delay variable 1
.def Delay2  =r18          ; Delay variable 2

;***** Initialization
RESET:
    ser Temp
    out DDRB,Temp           ; Set PORTB to output

;**** Test input/output
LOOP:
    out PORTB,temp           ; Update LEDS
    sbis PIND,0x00            ; If (Port D, pin0 == 0)
    inc Temp                  ; then count LEDS one down
    sbis PIND,0x01            ; If (Port D, pin1 == 0)
    dec Temp                  ; then count LEDS one up
    sbis PIND,0x02            ; If (Port D, pin2 == 0)
    ror Temp                  ; then rotate LEDS one right
    sbis PIND,0x03            ; If (Port D, pin3 == 0)
    rol Temp                  ; then rotate LEDS one left
    sbis PIND,0x04            ; If (Port D, pin4 == 0)
    com Temp                  ; then invert all LEDS
    sbis PIND,0x05            ; If (Port D, pin5 == 0)
    neg Temp                  ; then invert all LEDS and add 1
    sbis PIND,0x06            ; If (Port D, pin6 == 0)
    swap Temp                 ; then swap nibbles of LEDS

;**** Now wait a while to make LED changes visible.
DLY:
    dec Delay
    brne DLY
    dec Delay2
    brne DLY
    rjmp LOOP                ; Repeat loop forever
```