Lab 8 – Assembly Programming

CS1050 Computer Organization and Digital Design

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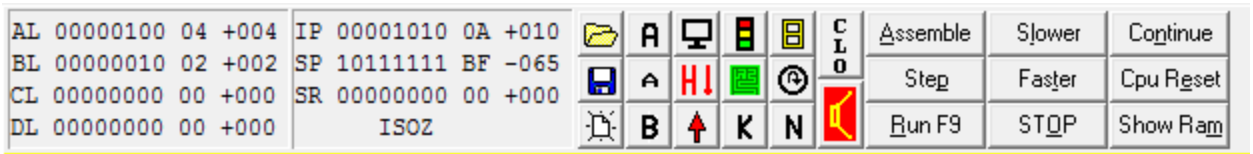
Lab Task

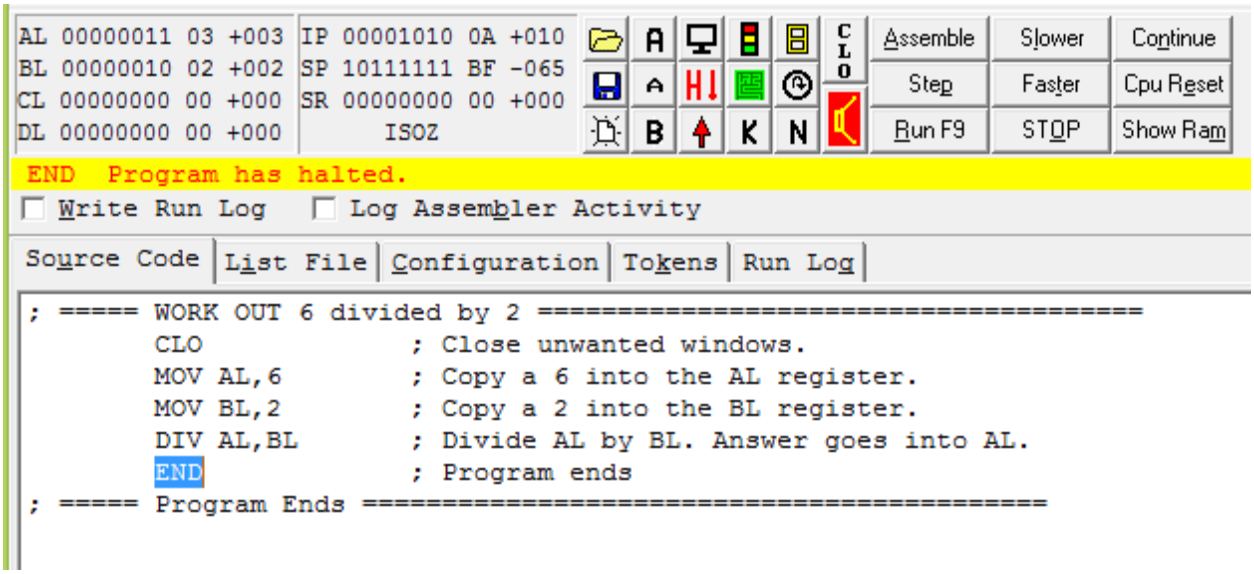
- In this lab, we will use the Microprocessor Simulator (a.k.a. smz32), to develop and simulate Assembly programs.
- Try to understand the source code for add two numbers and modify the Assembly code to subtract, divide and multiply the two numbers.
- Get familiar with Assembly programming and the simulator by running several more samples.
- Modify an existing example to program signal lights to make them real by controlling the time that each light stays on.
- Modify a program to show the last two digits of index number using 2, 7-segment displays.
- Develop a new Assembly program to multiply all integers from 1 to 5 and show the final answer as a hexadecimal value using 2, 7-segment displays.

Assembly code to subtract two numbers

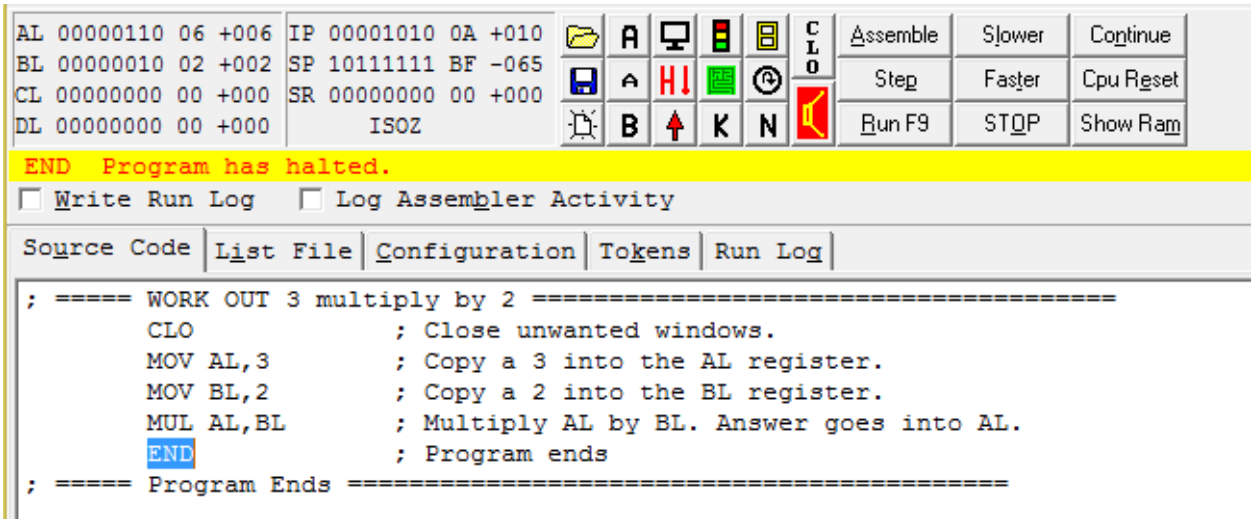



```
; ===== WORK OUT 6 subtract 2 ======================================
        CLO             ; Close unwanted windows.
        MOV AL,6        ; Copy a 6 into the AL register.
        MOV BL,2        ; Copy a 2 into the BL register.
        SUB AL,BL       ; Subtract BL from AL. Answer goes into AL.
        END             ; Program ends
; ===== Program Ends ===============================================
```

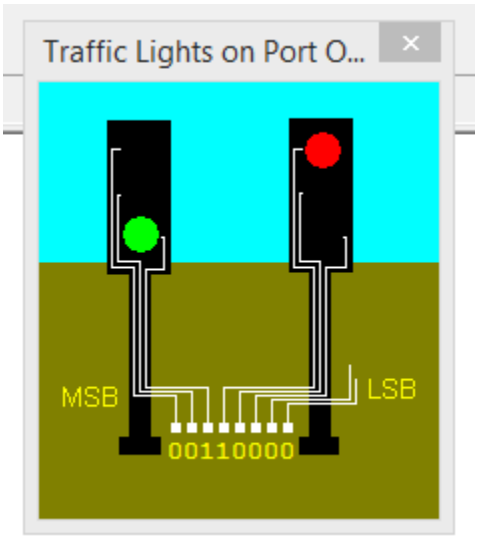
Assembly code to divide two numbers



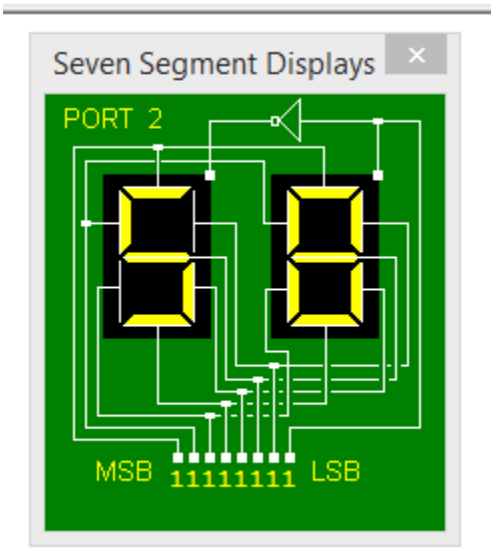
Assembly code to multiply two numbers



Traffic Lights



Display last 2 digits of index number using 2, 7-segment displays



Display final answer of multiply all integers from 1 to 5 in hexadecimals using 2, 7-segment displays