Lab 2

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Objective-

This lab's objective is to write and 8051 assembly program to calculate (A+B)^2 in two different ways.

Equipment used-

Software: a text editor and an 8051 ASM assembler

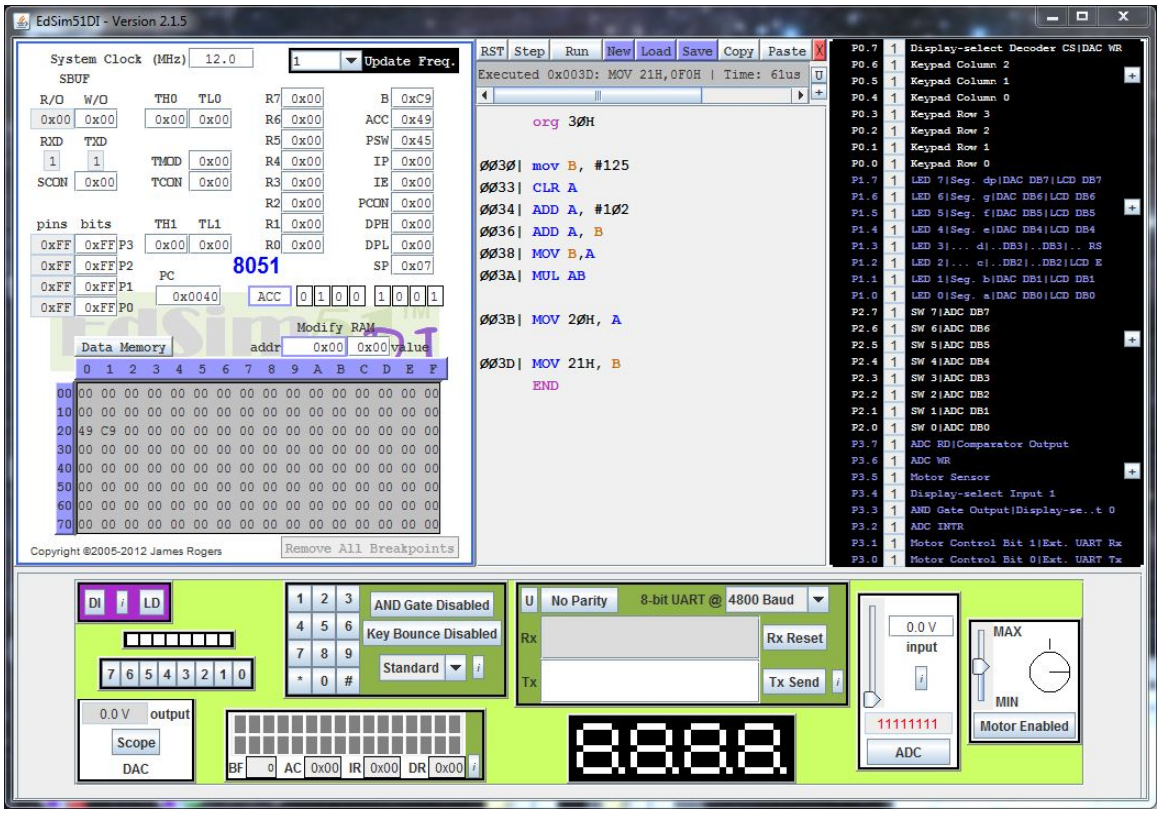
A step debugger that can be used to execute a program one step at a time

Register, code memory, data memory, and input/output port contents are displayed to aid debugging.

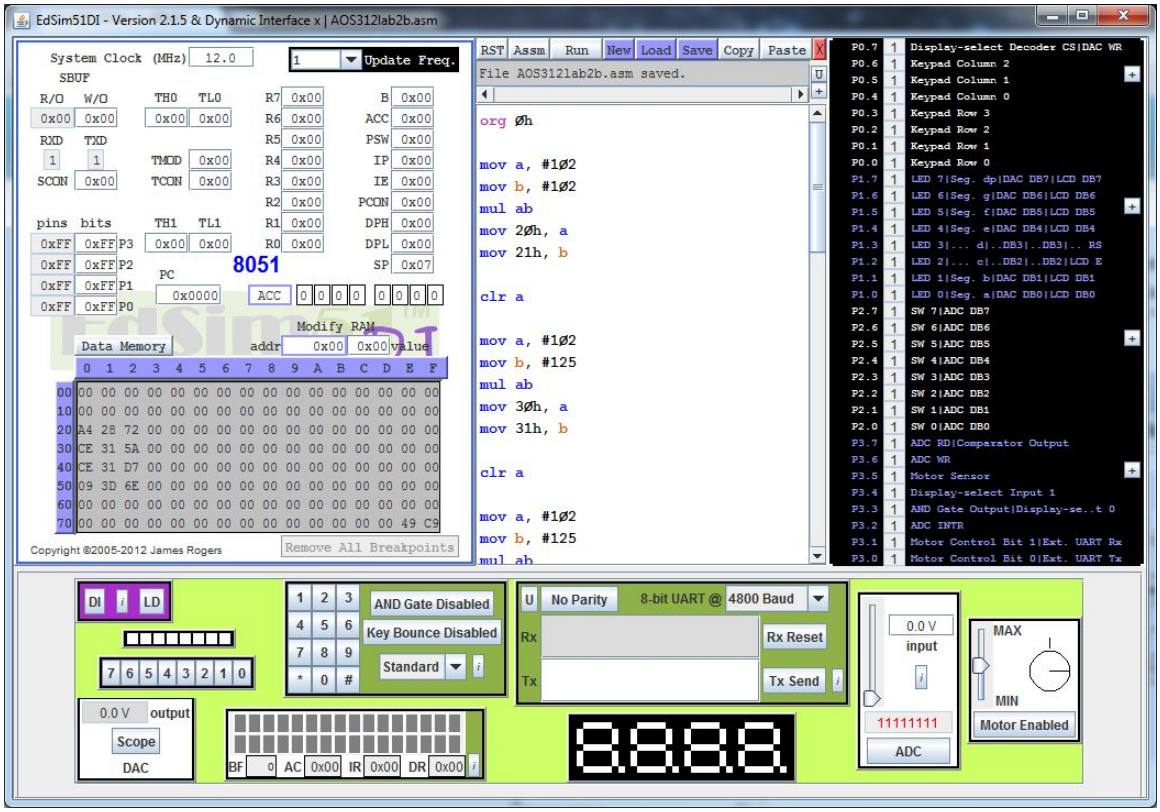
Flow Chart-

Test Results-

This screenshot shows that the first part of the given code was computed correctly, getting C949h.



This screen shows that our code computes C949h correctly, located in the bottom right corner of Data Memory.



Conclusion-

This lab required us to think in a non-conventional way to perform the proper order of operations. It helped me to understand how the 8051 does simple math, with the help of the ADDC function.

Program-

```
org 0h
;;A*A
mov a, #102
mov b, #102
mul ab
mov 20h, a
mov 21h, b
```

```
clr a
;;A*B
mov a, #102
mov b, #125
mul ab
mov 30h, a
mov 31h, b
clr a
;;A*B
mov a, #102
mov b, #125
mul ab
mov 40h, a
mov 41h, b
clr a
;;B*B
mov a, #125
mov b, #125
mul ab
mov 50h, a
mov 51h, b
clr a
.....
;;;;;;;;;;;;;;;;;;;
;starting to calculate with the carry function
;;Lower of Asquared + lowerAB
mov A, 20h
add A, 30h
mov 22h, a
clr a
;;Upper of Asquared + upperAB
mov a, 21h
addc a, 31h
mov 32h, a
clr a
```

```
;;Lower of AB + lower Bsquared
mov a, 40h
add a, 50h
mov 42h, a
clr a
;;uppoer of AB + Lower Bsquared
mov a, 41h
addc a, 51h
mov 52h, a
clr a
;;Lower of final result
mov a, 22h
add a, 42h
mov 7Eh, a
clr a
;; Upper of final result
mov a, 32h
addc a, 52h
mov 7Fh, a
end
```