CECS 285: Lab2
8051 ASSEMBLER & SIMULATOR – Due 1/26/2016

OBJECTIVES:

- To examine and use an 8051 assembler and debug simulator.

ACTIVITY 1:

Write and assemble (Build) a program to:

- Move value 99H to register A
- Then from register A move it to all registers R0 - R7
- Comment each line with the register transfer operation taking place. For example:
  - `mov a, #0x99  ;A <- 99H`
  - `mov r0, a     ;R0 <- A`

Use the debug simulator to single-step through the program and examine the value 99H appearing in each of the registers.

ACTIVITY 1 Deliverables:

Once the debug simulation has reached the end of execution (i.e. registers **R0-R7 and A each contain the value 99H**) **take a single screenshot of the Keil debug environment showing**:

- The value 99H in each of the registers in the debug Register window pane
- Your fully commented source code with register transfer notation on each line

Paste this screenshot in a word document that you will later submit to beachboard after completing the next activity in this Lab.

At the top of your source code in comment fields, be sure to include:

1. Your name
2. Student ID

Proceed to ACTIVITY 2.

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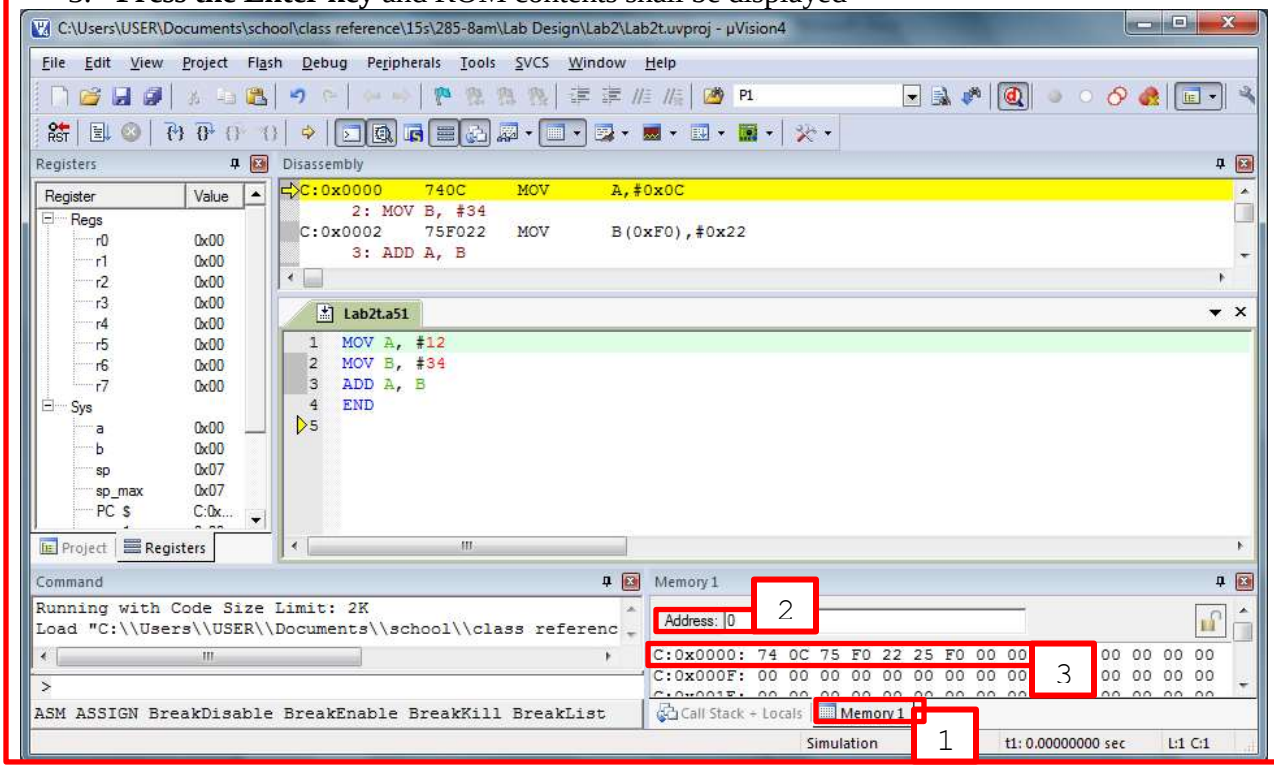
ACTIVITY 2:

Write and assemble (Build) a program to:

- Find the sum of all the single digits of your Student ID number
  - HINT: this will require a MOV operation to place the first digit of your student ID into the Accumulator then 8 ADD operations.
- Finally Transfer the sum from the Accumulator to general purpose register R2.
- Also *comment each code line with the assembly operation being performed*. For example:
  - `mov  a, #0      ;A <- #0`
  - `add  a, #4      ;A <- A + #4`

Then use the debug simulator to *single-step through the program and examine register contents being updated*. With the debug window still open, view the contents of ROM (code space) through the Memory1 window pane:

1. Click on the **Memory1** Window pane
2. Insert value *0 in the Address text box*
3. **Press the Enter key** and ROM contents shall be displayed



ACTIVITY 2 Deliverables:

Once the debug simulation has reached the end of execution (i.e. the sum of your Student ID digits is in R2) take a single screenshot that **clearly** shows the Keil debug environment along with:

- The sum of your Student ID digits in register R2 in the debug Register window pane
- ROM contents starting at memory location 0000 in the Memory1 window
- Your commented source code

Paste this screenshot in a word document that you will submit to beachboard after completing the activities in this Lab.