You will use TUTE to: (1) enter the source program below, (2) assemble it, (3) load the resulting machine code into the EVBU's ram, and (4) answer questions about. Hand in your answers before leaving lab.

1. Open up TUTE as you did in Lab 1.
2. Open a serial communication path to the EVBU
3. Select the Comm Tab and then expand the Comm window so you can see what is happening in this window.
4. In the blue area, write the source program below.
5. Add a comment to each line describing what that line does. The first line is done for you.
6. Save it as Lab 2.asm The .asm extension is important for TUTE to color code the text
7. Assemble your source program and fix any errors (Select the "Messages" tab to see errors)
8. Select the "Listing" tab, right click on the listing and select "Print" to print the listing.
9. On the listing circle the opcode byte(s) for each instruction.
10. For each instruction state why the operand takes as many bytes as it does. E.g., on the first say: need the one byte number to be loaded into "A".
11. Send the machine code to the EVBU with **Run -> Load**
12. Set the start of execution to the first statement of the program by putting the cursor at this statement and then selecting the menu items **Run -> Set Execution Point**. This statement should then be bounded by a blue dotted box. If it isn't, try loading again.
13. Step through your program by **Run -> Step**. This allows you to step through the program as you did before, but you are letting TUTE do the work. Verify that each instruction does as you expect. (Recall you can use the MD instruction in the Comm window). Demonstrate to a T.A.
14. In the Comm window type "ASM 100". This will read the bytes in memory and interpret them as an instruction and will allow you to change them. (Note that we will use TUTE to make code changes by editing the code and redownloading.)
15. Hit "Enter" to go to the next instruction. On your listing describe what it shows.
16. Type a period to stop the "ASM mode".
17. type "ASM 101", hit "Enter" a few times, give the results and describe on your listing why you got those results.

Program for Lab 2

```
        ORG   $0100

        LDAA  #$20    ; Load the hexadecimal number 20 to the A register
        LDAB  #$20
        LDAB  #20
        LDX   #$20
        LDY   #$20
        STAA  $FF
        STAA  $1FF
        CLRA
        INCA
        ADDA  #20
        ADDA  $FF
        ADDA  $1FF
        BRA   $100
```