

# COMP 183 Lab 1

Note: This work must be completed within 1 week of this lab time.

Name: \_\_\_\_\_ ID: \_\_\_\_\_

## Goals:

1. Be able to start the COMP 183 development environment.
2. Be able to convert and add decimal, binary, and hexadecimal numbers (integer and floating point, signed magnitude and two's complement)
3. Be able to interpret memory sizes
4. Be able to convert to and from IEEE 754

## Part A:

- As soon as you get one of the Download cards, complete the steps below. Please do NOT do any of the steps without a Download card, or the College network may grind to a halt :(
  - When you have completed the steps of Part A, please pass your Download card to someone who has not yet used a Download card. If no such person exists, please return your Download card to your instructor.
  - The use of Download cards only applies during scheduled COMP 183 labs.
1. Place the Download card on your desk
  2. The V: drive contains a VirtualBox image of the COMP 183 development environment. You now have 3 choices. Please pick 1 of the following:
    - A. You can open the image directly over the network, but be aware that in future labs, you will again have to wait until you get the Download card.
    - B. Copy the image to your C: drive and then open the image from there. However, IT Services has the ability to re-image drives every night, so anything on the C: drive is not guaranteed to persist overnight. This means that if the image disappears, you will need the Download card again to copy the image to the C: drive in the future. Plus, anything you saved to the image will have been deleted.
    - C. Copy the image to your USB flash drive. You can then open the image locally without going over the network (and therefore won't need a Download card). You can also open it on your personal computer (if applicable) and use it in class to try out the examples live. This option is the preferred choice.
  3. Once you have completed Step 2 above, pass the Download card to someone else who has not yet used the Download card
  4. Launch the VM
  5. Log in as the vmadmin using the password *CamosunCST911*

6. Change the vmadmin password. Don't forget what it is! If you forget, you will have to draw on your COMP 176 knowledge (or Google) to recover.
7. Log out of vmadmin
8. Log in as vmdev using the password *CamosunCST911*
9. Change the vmdev password. Don't forget what it is! If you forget, you will have to draw on your COMP 176 knowledge (or Google) to recover.
10. vmadmin should only be used for administrative purposes; use vmdev for your course work
11. Open ebe (the icon with the question mark)
12. Load the file hello.c from the Desktop. You will have to explore the ebe interface a bit to figure out how to do that. If you are stuck, please read Appendix B of the Assembly text.
13. Run the program
14. (4 Marks) Show the result to your instructor

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(Instructor Stamp)

15. Shut down the virtual machine using the Shut Down menu option available via the top right-hand side wheel icon. Do NOT just power off the virtual machine, or it could become corrupt. You will have to rely on your COMP 176 knowledge (or Google) to recover from a corrupt VM image.

## Part B:

16. Complete the following table. You are welcome to use tools like [exploringbinary.com](http://exploringbinary.com) to check your work, but be aware that you will have to be able to make the computations unaided during a quiz or an exam! Also, to get full marks, you have to show your work, where indicated.

A. (2 Marks) Convert 37 to binary. Show your work.

B. (2 Marks) Convert 37 to hexadecimal. Show your work.

C. (1 Mark) Convert 37 to 8-bit signed magnitude

- D. (1 Mark) Convert 37 to 8-bit two's complement
- E. (2 Marks) Convert -25 to 8-bit signed magnitude. Show your work.
- F. (4 Marks) Convert -25 to 8-bit two's complement. Show your work.
- G. (2 Marks) Convert  $101110_2$  to decimal. Show your work.
- H. (2 Marks) Convert  $101110_2$  to hexadecimal. Show your work.
- I. (2 Marks) Convert  $BEEF_{16}$  to decimal. Show your work.
- J. (2 Marks) Convert  $BEEF_{16}$  to binary. Show your work.
- K. (2 Marks) Convert  $1001\ 1110_2$  to decimal. Assume 8-bit signed magnitude. Show your work.

L. (4 Marks) Convert  $1001\ 1110_2$  to decimal. Assume 8-bit two's complement. Show your work.

M. (8 Marks) Convert 123.321 to a IEEE 754 float. Show your work

N. (8 Marks) Convert  $01000011001101110010110011001101_2$  to decimal, assuming it is a IEEE 54 float. Show your work.

O. (2 Marks) Add the following:

$BEE_{16}$

$+EEC_{16}$

P. (2 Marks) Convert 10346235 bits to mebibits

/50 = /10