ECS 50 Study Guide

1. Everything in the computer is represented using what?
2. There are no _____ at the assembly level.
3. If you have N unique states, what is the minimum number of bits needed to represent them all?
4. If you have B bits how many unique states can you represent?\
5. Be able to convert from one base to any other base.
    1. What is 456_7 in base 4?
    2. What is 01 1101 1111 in base 16?
    3. What is 0xF57AC in binary?
6. Know the 2 different ways of representing singed numbers in binary
    1. For the following 8 bit numbers what are their values in Sign Magnitude and 2's compliment?
        1. 0010 1010
        2. 1101 1110
7. Know how a real number is stored using IEEE floating point format.
8. Know how to convert a real number to its IEEE floating point format.
    1. How is 57.25 stored in IEEE floating point format?
9. Know the difference between little endian and big endian. Why is endianess an issue?
    1. If the value 0x 45 89 55 67 is stored in bytes 1000 – 1003 what is the value of the number being stored if the machine is little endian? Big endian?
10. What does byte addressable mean?
11. What are the two options for storing multidimensional arrays.
12. Given that Ar is a 3 dimensional array declared as Ar[2][3][4]. What is the single dimensional index of Ar[1][2][2] if Ar is stored in row major. In column major?
13. What does the following binary string represent 0110 1101?
14. What are the 4 major steps executed by the CPU?
15. What are the 2 major components that make up your computer?
16. Name at least 2 reasons why a program compiled on one computer may not run on another computer.
17. Be able to correctly use the bitwise operators and bit shifting.
    1. Construct a mask that once anded with a 32 bit number would allow you to examine bits 11, 5, and 3.