1. What is a computer system?
   A computer system is a set of layers each consisting of different functionalities that eventually build upon each other to create a system. At the lowest level, you can have digital logic and at the top we have executable programs. Each level builds upon itself in complexity and allows the user to run more and more complex programs
2. What are some parts of a computer system?
   Some of the parts in a computer system include:
   a. The CPU: central processing unit
   b. Some place to store memory, whether that be RAM, ROM, HDD, SSD
   c. A processor capable of handling input and output
3. What is the difference between a compiled language and interpreted language?
   A compiled language uses a compiler to take higher level code and turn it to assembly code and then another translator to turn that assembly to machine code. An interpreted language uses an interpreter to take high level code and execute the code directly, essentially skipping over the compiler step.
4. Is “C” a compiled language?
   C is a compiled language and uses the gcc compiler to convert the code into assembly.
5. Who invented “C”?
   C was invented by Dennis M. Ritchie in the 1970s.
6. How long has “C” been in use?
   It was invented in the 1970s, so presumably around 50 years.
7. Is the compiler a translator?
   A compiler is technically a translator that takes high level code and translates it to assembly level code.
8. Is the assembler a translator?
   Yes, the assembler takes assembly level code and translates it to machine level code.
9. What is the command to list out the contents of a dictionary on a mac terminal window?
   To list out contents on mac, you do ‘ls’ or dir on windows.
10. What does the “C” function atof() do?
    atof() takes some string value and converts it to a numeric value, specifically a double. For instance, the string “32” would be converted to the double 32.00.
11. What are the bottom two layers of the computer system? Give a brief description of each.
    The two are
    a. Digital logic: includes logic gates and circuit architecture. All computer operations use this as it is the building block of everything else in the computer. Includes things like the motherboards and daughterboards.
    b. Control: contains some hardware and microcode building upon the layer below it. Microcode can be made using internal system firmware.
12. What are the three steps of Von Neumann Architecture?
    The three steps are:
    a. Fetch
    b. Decode
    c. Execute

13. What is the purpose of an ALU?
    The ALU controls instruction and execution. It contains registers which contain gates and sets of bits that can hold either 1 or 0 and includes a program counter which stores the memory address of the next instruction.
14. What is a register?
    A register is a special kind of high speed memory that is made up at the gate level and stores sets of bits in the form of either 1's or 0's.
15. What is the difference between application software and system software?
    Application software is written for people. It contains a lot of abstraction to work for people. Meanwhile, system software is written for machines and contains significantly less abstraction than application software. This means the concepts it deals with are focused on registers and such.
16. Is rdi, rsi, and cmp machine code?
    No, this language is assembly code which is higher level than machine code. Machine code would only include bits such as 1 and 0.
17. What are the 3 buses in the system bus?
    There are 3 buses:
    a. Data bus
    b. Control bus
    c. Address bus
18. What is the decimal value of 10010111_2?
    10010111_2 = 1+2+4+16+128 =151
19. What is the decimal value of 11111111_2?
    11111111_2 = 1+2+4+8+16+32+64+128 = 255
20. What is the largest unsigned integer that will fit in 16 bits?
    The largest value would be:
    a. 2^16 - 1 = 65535