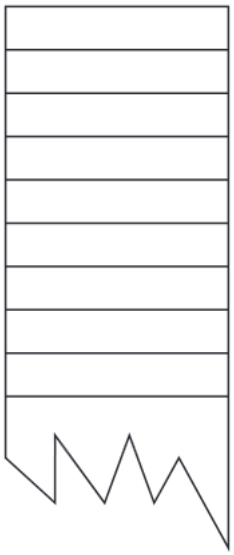
Name: _____

CS 002 Practice 0 for Midterm 1 (last updated: Spring 2021)

Question Pool

1. A portion of a computer's main memory is shown below. Suppose a variable of type double (8 bytes) is declared, and then a variable of type char (1 byte) is also declared. Label the diagram below so that it represents one possible way that these data types might be stored in memory, including the addresses of each variable.



2. What is the difference between a high level programming language and a low level programming language?

3. Of the five main components of a computer hardware system, what is the role of the processor?

4. Listed below are the first 2 steps of the software life cycle. Describe what happens during each phase.
    1. Analysis and specification of the task
    2. Design of the software

5. Listed below are the third and fourth steps of the software life cycle. Describe what happens during each phase.
    3. Implementation
    4. Testing

6. Listed below are the last 2 steps of the software life cycle. Describe what happens during each phase.
    5. Maintenance and evolution of the system
    6. Obsolescence

7. In software, what is the role of the operating system?

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8. An integer is stored in memory using 4 bytes. How many values can an integer data type take on? Explain why.

9. What is an algorithm? Give an example of an algorithm for some programming task.

10. What is the role of the compiler and the linker?

11. List the three types of program errors, and describe what each one means.

12. Of the five main components of a computer hardware system, what is the difference between main memory and secondary memory?

Problems of Interest (Remember, you can only use concepts presented in class thus far!)

1. Write a program that will prompt the user to enter a two digit number. If the first digit is a factor of the second digit, display a message. After the program runs 4 times, show the user all the numbers they entered.

   Sample output

   Enter a 2 digit number: 48
   Yes 4 is a factor of 8.

   Enter a 2 digit number: 62
   No 6 is not a factor of 2.

   Enter a 2 digit number: 19
   No 1 is not a factor of 9.

   Enter a 2 digit number: 39
   Yes 3 is a factor of 9.

   48 62 19 39

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2. Write a program that will prompt the user if the user wants to make change, and if so, prompt the user for the number of cents, as a whole number, and output the fewest number of coins necessary to make change for the amount entered. (excluding $1 coins, 50 cent coins)

   Sample output

   How much change? 96
   3 quarters, 2 dimes, 0 nickels, 1 pennies

3. Write a program that will ask the user for a number m, and then tell the user if that number is a prime number or not.

   Sample Output

   Enter a number: 45
   45 is not prime.

   Enter a number: 37
   37 is prime.