CISC106 Homework 1

(55 pts) Due Wednesday, February 26 at midnight (submit via Canvas)

Note: While future labs can be done with a partner if you so choose, this homework should be done individually. Aside from the work being relatively personal (your computer and your partner's computer may not have the same amount of RAM), I want to make sure that everyone has Python running on their computers. While you may ask others in the class for input or help, everyone should work on and turn in their own homework.

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Create a word document and answer the following questions:

TAs: (2 pts)

Name and give the email address of your TA

Hardware: (16 pts)

1. (4) What are the differences between RAM and the Hard Drive?
2. (3) What does your CPU do?
3. (2) How much RAM does your computer have?
    - under **control panel->system** on a pc,
    - under **apple menu->about this computer** for a mac
4. (2) How much space is on your hard drive?
    - under **computer->c:,** right click and select **properties** on a pc,
    - on a mac right-click on the **HDD** and select **Get Info**
5. (2) How fast is your CPU? (You figure out how to determine this one…)
6. (2) What is a bit? How many in a petabyte?
7. (1) What does hertz measure?

Binary: (4 pts)

1. (1 pt) What binary number comes after 10111_2?
2. (1.5 pts) Convert 35_{10} to a binary number. You must show your work. Double-check your answer using Google.
   (1.5 pts)Convert 101010_2 to a decimal number. You must show your work.

Software (8 pts)

3. (4) What do both a compiler and an interpreter do?
4. (4) What is different about how a compiler works and how an interpreter works?

Creative Thinking (11 pts):

Problem 14 (6 pts) *Contrary to popular belief, computer science is really incredibly creative. It is a matter of taking the tools you have and solving the problem you are given (or are interested in solving). In essence, it is puzzle solving. Along those lines, solve the following problem:*

Given:

1132 = 0
7842 = 2
3266 = 2
4172 = 0
8219 = 3
6189 = 4
7066 = 3
3913 = 1
3213 = 0
6476 = 2
9817 = 3

What are the following?

1. 3968 = ?
2. 1724 = ?
3. 2061 = ?

(5 pts) Give a solution to the following problem:

Bert is a compulsive hoarder. At the hoarder's anonymous meeting, he tells the group that one (and only one) of the following is true:

He has one of the following (and only one!:

5 dogs, 6 dogs, or 9 dogs

7 cats, or 8 cats

4 goats, 6 goats

4 rabbits, 5 rabbits, or 7 rabbits

Bert then tells Ann the type of animal he has.

And then he tells Joe the number of animals he has (he only has one type of animal).

In talking with Joe later, Ann says, “I don’t know exactly what Bert has, but I’m certain you don’t either, Joe.”

Joe then replies, “well, I didn’t know, but now I know”.

And Ann replies, “Oh, now I know too”

What and how many did Bert have? (Explain your logic).

Basic Programming (14 pts):

Welcome to programming!:

In python, create a file and fill in the following functions (defined below).

For each function, in comments above the function, give 3 examples of input numbers (in this lab, all the examples will use basic numbers, or integers) and the results you’d expect given those input numbers. For instance, if the function sums two numbers, in your comments you should have something like this:

Sum(7, 2) -> 9
Sum(3, 4) ->7
Sum(12, 25) ->37

Problem 1 (2 pts): Write a function that takes as an input parameter a number representing centimeters. The function returns its equivalent in inches.

Problem 2 (2 pts): Write a function that takes as input parameters two numbers representing the angles of a triangle, and returns the third angle

Problem 3(2 pts): Write a function that takes as input parameters two integers- the base and the height of a triangle. It should return the area of the triangle.

Problem 4 (2 pts): Write a function that takes two numbers as input parameters and returns the remainder of the second number divided into the first number.

Problem 5 (3 pts): Write a function that takes 5 integers as input parameters and returns the average of those 5 numbers.

Problem 6 (3 pts): Write a function that takes as input 3 integers (maybe your exam scores). The first exam is worth 14% of your grade. The second is worth 15% of your grade, and the final integer is worth 21% of your grade. Return your grade.

To turn in:

The word document, with the answers to the hardware, software, and Creative questions

The .py python text file with your 6 functions.