CSC 120 Extra Credit Assignment

This assignment tests your understanding of chapters 0,1 and 2 as well as Python. If you score full points in this assignment, they will be counted towards your scores from Lab/Quiz 0, Lab/Quiz 1 and Lab/Quiz 2. For example, if you score 150/150, those 150 points will be awarded to make up for the points you lost in those labs/quizzes. However even if you score all the points in this assignment your Lab/Quiz scorres would not exceed 100 points which is the maximum.

* **Conceptual Questions (+90 points)**
* (+5) If an instruction is 32 bits long, how many hexadecimal digits would be needed to represent it?
* (+5) What is the difference between volatile and non volatile memory? Why do you have two different types of memory?
* (+5) What is the goal of CPU registers VOLE architecture? (For example, Load, Store etc.)
* (+3) Is 102100 a valid binary number? Why?
* (+3) Convert 1F2 (hex number) to decimal.
* (+3) Convert FF04 (hex number) into binary.
* (+5) If you have a 6 bit binary number, what is the maximum value (in decimal) that can be represnted by this number. Describe with an example.
* (+5) Instead of a 6-bit binary number, if you have an n-bit binary number , what is the max value in decimal that can be represented by it? For example, start with a 1 bit binary number then a 2 bit binary number and so on and try to generalize
* (+3) Explain the concept of abstraction in software with your own example.
* (+5) If you want to represent a number like 1.02 in binary, what would you do?
* (+3) How many bits are used for opcode and operand in the Vole architecture?
* (+5) How are ARM processors different from Intel processors? (You can read online for this and write your own understanding. Try and understand RISC vs CISC).
* (+10) What are flip flops? Why are they necessary in digital circuit design?
* (+10) What is the role of cache memory?
* (+10) Classify the types of memories in terms of their prices and size: cache memory, main memory and hard drive.
* (+10) What is the importance of studying chapter 1 and chapter 2? Why do you think it is necessary to learn these concepts?

**Programming Questions (+70 points)**

* (+5)Write a for loop that prints the following numbers upto 99. [0,3,6,9,12,15...99].
* (+5) rite a while loop that prints the following numbers upto 99. [0,3,6,9,12,15...99].
* (+10) What happens when you run this code? Why?

i = 0

while i < 100:

print (i)

* (+10) Identify the problem with the following piece of code. What happens when you run this code? How would you fix the issue? and Why?

i = 0

while i < 100:

print (i)

* (+10) How would you fix the following piece of code? Why does this code not work?

for i in range (10, 50, 2):

print ("The value of i is :" + i)

* (+10) Explain the concept of loop initialization. Provide an example. (Refer online. This is meant to help you how figure things by reading online)
* (+10) Write a loop that keeps accepting digits from a user and terminates when the user enters a non digit as input. For example, here is how the program would run.

**Please enter a digit:** (Program prints this line)

< User enters 6>

"You entered 6" (Program prints this line)

**Please enter a digit**

<User enters 2>

"You entered 2" (Program prints this line)

**Please enter a digit:**

<User enters a>

"You did not enter a digit. Terminating program" (Program prints this line)

<Program terminates>

**Instructions: Upload the file with the screenshot on Blackboard with your firstname\_lastname.docx**