October 9, 2018 (Mid Term Review)

Notebook:	Computers and Programming I		
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Chapter 1

- Hardware
  - Any physical devices that make up a computer
  - The CPU
  - Main Memory
    - RAM
    - volatile
  - Secondary Storage
    - can hold data for long periods of time.
    - Programs are normally stored here and located to main mem
    - Types of Storage Devices
  - Input Devices
  - Output Devices
- Software
  - Application
    - programs you use to do day to day activities
    - Word processing, emails
  - System Software
    - Operating System
    - Utility Programs
    - Software Development Tools
- How Machine Stores Data
  - Stored in sequences of zeros and ones
  - Byte
    - Conversion of Binary to Decimal and vice versa
  - ASCII (know these)
    - A - 65
    - a - 97
    - B - 66
    - b - 98
    - sp - 32
  - Unicode
    - compatible with ASCII
    - can represent characters of other languages
  - Two's Complement
    - To store negative numbers and real numbers, computers use binary numbering and encoding schemes
  - Other Types of Data
    - Images
    - Music
- How A Program Works
  - Program must be copied from secondary memory to RAM each time CPU executes it
  - CPU executes program in a cycle (Machine Cycle):
    - Fetch
    - Decode
    - Execute
- From Machine Language to Assembly Language
  - Impractical for people to write in machine language
  - Assemble Language:
    - uses short words (mnemonics) for instruction instead of binary numbers
    - You have to know how CPU and registers work

            - Easier for programmers to work with
            - Add a,b
            - Sub a,b
        - Assembler
            - translates assembly language to machine language for execution by CPU
        - High Level Languages uses compilers and interpreters to convert high level languages into low level languages
            - C++
            - Java
            - Python
    - Keywords
        - predefined words used to write program in high level language eg. print, if
        - Operators: perform ops on data
        - Syntax: set of rules to be followed
        - Statement: print ("Hello")
- Compilers and Interpreters
    - Interpreters:
        - Translates and executes instructions in high level language program
            - Used by python
            - Interprets one instructions at a time
            - No separate machine language
        - Source Code
            - Statements written by programmers
        - Errors
            - Syntax
            - Logical
            - Run
                - Program is compiled but won't execute
                - Divide by zero

Chapter 2

- Programs must be designed before written
- Program development cycle
    - Design the program
    - Write the code
    - Correct syntax error
    - Test the program
    - Correct logical errors
- Algorithm
    - set of well-defined logical steps that one must take in order to solve a problem
- Pseudo code
    - Informal language that has no syntax
    - Fake code
- Typically, computer performs three steps:
    - Receive
    - Processing
    - Output
- Displaying Output w/ the print Function
    - Function: pre written code that performs an operation
    - print function: displays output on screen
    - Argument: Data given to any function
    - String: sequence of characters that is used as data
    - String Literal: Anything sting passed through a function
- Comment
    - notes with explanation

    - End Line Comment
        - appears at the end of a line of code
            - typically explains the purpose of that line
- Variable
    - Memory Locations
        - Start with underscore or letter character.
        - After which, only letter characters, underscores or numbers .
        - No space
        - Cannot be a Python keyword
        - Variable names are case sensitive
    - Assignment Statement
        - num = 10
    - Variable name should reflect its use
- Orders of Operations
    - Parenthesis
    - Exponents
    - Multiplication and Division
    - Addition and Subtraction
        - If two orders are in the same problem, do the left more one first

Chapter 3
x = 10, y = 2, z = 5

- if (x>y):
    - print ("x is greater than y")
- else:
    - print ("y is greater than or equal to")
- For letters, compare character by character, and look for the largest number.
- not (x>10)
    - This is statement is false as 10 = 10
    - What is not false? True

October 18, 2018 - Mid Term
Definitely going to write a program and algorithm