Computers & Programming I

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* Programs must be designed before they are written

**Program Development Cycle**

1. Design the program
2. Write the code
3. Correct syntax errors
4. Test the program
5. Correct Logical Errors

**Types of Errors**

* Syntax Errors
  + Print ‘hello
    - Ending quotation is missing
  + Violation of rules
* Logic Errors (Most Dangerous Types)

Length

Width

Area = length + width

* Run Time Errors
  + Program will compile but won’t run
    - Num1= 5
    - Num2= 0
    - Val=num1/num2
      * Notice result did not appear

**To Test Program**

We are running program to convert capital letters to common letters

a

a

a

A

A

A

Use the following to test program output

Blank

Digits and Non Alphabet

Other Letters

aaa

AAA

* Program design is the most important part because you need to understand what is being asked of you.
  + Create software requirements
  + Ask questions
  + Work with customer to get a sense of requirements
* Determine the steps that must be taken to perform task
  + Break down the required steps into series
  + Create an algorithm listing logical steps that must be taken
* Algorithm:
  + A set of well-defined logical steps that must be taken to perform a task
* Sample Program To Add Number/ Psedocode
  + Prompt user to enter two integers
  + Read 2 integers
  + Compute the sum
  + Print the result
* Pseudocode:
  + An informal language that has no syntax rules
  + Used to create a model
  + No need to worry about errors
  + Can be translated into actual code
* Input, Processing, Output
  + Receive Input
    - Input: any data that the program receives while running.
  + Processing
    - Perform some process on the input
  + Output:
    - Produce output
* Function:
  + Piece of prewritten code that performs an operation
  + Eg: The print function: displays output on the screen.
* Argument:
  + Data given to a function
* Statements:
  + In a program, this is executed in the order in which they appear.
* Strings:
  + Sequence of characters that is used as data.
* String Literals
  + Words appearing in quotes
* Comments
  + Ignored by interpreter
  + Notes of explanation
* Endline Comment:
  + Appears at the end of a line of source code
  + Typically explains the purpose of that line
* Variable:
  + Memory location
  + A = a + 1
    - A is used as an assignment
  + Name that represents a value stored in a computer memory
  + References values it represents
  + Should always be on the left
  + Can only be used if a value is assigned to it
* Assignment Variable:
  + Used to create a variable and make it reference data.
* General Format of variable
  + Variable = Expressions
    - Age = 23
    - Assignment operator is the equal sign
* Variable Interpolation
  + print ‘value is num is’, num is 10

**Rules For Naming Variables**

* Cannot be a python keyword
* No spaces
* First character must be a letter or an underscore
* After 1st characters, you must use letters, digits or underscores

**Using Python**

* Python Interpreter can be used in two modes:
  + Interactive
  + Script
* Python must be installed and configured prior to use
* IDLE – editor, interpreter and debugger