CS 111 + Bio (Green): Program Design I **Fall 2016**

Lab Assignment 1 (Due August 31 on Blackboard)

Learning Objectives:

- Using Python and command line
- Writing Python programs
- Working with variables
- Working with Strings
- Understanding nucleobase structure

The structure of DNA is made of long chains of nucleotides. Each nucleotide includes deoxyribose, a phosphate group, and a base, one of: **A**denine, **T**hymine, **C**ytosine, or **G**uanine, denoted by the letters **A, T, C, G**. This lab will consist of a basic manipulation of a sample string of DNA.

Setting up Python

If you have not yet set up Python on your computer see instructions here: `https://www.cs.uic.edu/CS111Green/PythonSetUp`

Part 1: Length of the DNA string

Write a program that sets the number of bases of each type (A, C, T, G) in a DNA string and computes and prints its length. You should have a variable for the number of each base and your program should print the total. For example, for a string with 245 A's, 5069 C's, 713 T's, and 2934 G's the program should print "The total length of the DNA string is 8988".

Part 2: DNA replication

Write a program that starts with a DNA string and prints out a replicated string of that DNA. Create a String variable of any length that contains the letters A, C, T, and G. (e.g "ACTGCAT"). Print the duplicate of that string (in our case, "ACTGCATACTGCAT").

Submitting your homework

You should save both parts of this assignment as a single file that has the name *lab1_[yourNetid].py* (e.g., *lab1_tanyabw.py*) and submit it as a single file on Blackboard under Assignments →Lab Assignments → Lab1