CS476 Bioinformatics Exercise 2: PAM Matrix Generation

This purpose of this exercise is three-fold:

- Showing you an implementation of PAM substitution matrix computation to help clarify the equations.
- Giving you practice running programs on the home.cs.siue.edu server.
- Letting you generate PAM substitution matrix inputs for your first project on amino acid sequence alignment.

I have provided you with the following:

- A perl program to compute PAM matrices named **PAMCompMod.pl**
- The mutation probability matrix for input to the program named **PAM1-mutprob.txt**

To run the program on the home server, if you are on a Windows OS and have not connected to that server before, you may reference the video lecture entitled **RunningOnHome.mp4**. As mentioned there, using a different perl file as example, I demo usage of WinSCP and X2G0 to ftp and ssh onto the home server and run a program. I also mention other Windows programs (Cygwin and PuTTy) and the easiness of simply using the terminal for ftp and ssh if you are on Mac OS or a Linux version.

In this exercise, you are to run the perm program PAMCompMod on the home server to generate PAM substitution matrices of various divergence values:

5, 10, 25, 50, 100, 250, 500, 1000, 2000, 3000

The program will prompt you for the divergence value n, and it will output the resultant n-unit divergence PAM substitution matrix to a file named **PAM<n>scores.txt**, e.g. if you input 25 units of divergence then the output substitution scores will be to file PAM25scores.txt.

It should go without saying you are recommended to watch all the PAM video lectures in the meantime if you have not already. In the PAMDemo lecture video I am demonstrating runs of the original perl code I wrote upon which this one is based.

What to Submit for this exercise:

Submit a ZIPPED folder containing the ten PAM substitution score matrices output by the provided perl program for divergence values mentioned above. Additionally, in the same zipped folder, provide a README file (in text format) explaining briefly how you transferred the perl program and input file to the home server in addition to how you ran the code on the home server (e.g. explain what OS you are on and what applications you used for ftp and ssh).