

MBB/MCDB 452/752 Problem Set #1

Question #1

What is dynamic programming and explain its role in sequence alignment algorithms?

Question #2

In detail, explain the differences between FASTA and BLAST.

Question #3

What is the major limitation of the GOR algorithm and how could this problem be addressed?

Question #4

Define T , w , and S in the framework of the BLAST algorithm. Explain the interrelationship between these variables and how they will affect the sensitivity and specificity of the BLAST results.

Question #5

Explain how the PAM and BLOSUM matrices are derived. Describe the differences between PAM and BLOSUM matrices with regards to evolutionary distance.

Question #6

In detail, explain how the dynamic programming algorithm can be applied to structural alignments. Is it appropriate to use this approach? If not, explain the shortcomings and how they can be overcome.

Assignments should be e-mailed to cbb752@gersteinlab.org.

DUE DATE: February 12, 2010 by 5 PM.