

Student ID _____

Name _____

LOCAL ALIGNMENT

- 1) Execute local alignment between Seq1 = AGTCA, and Seq2=TTGTAG.

Fill all elements of the table below, and also answer the alignment score (maximum value). Use score constants of, Match = +2, Mismatch = -1, Gap = -1 (Linear Gap), and OutGap=0. Leave a pointer(s) for each node, for indicating its predecessor node(s) (the node(s) which gives the maximum value to that node).

		A	G	T	C	A
	0	0	0	0	0	0
T	0					
T	0					
G	0					
T	0					
A	0					
G	0					

Ans. _____

- 2) Show optimal local alignment between Seq1= AGTCA, and Seq2=TTGTAG..
 (Alignment should exactly correspond to the path chosen in exercise 3).
 Carefully follow the format used in exercise 1. (match = '|', mismatch = '•', etc.)

Ans. _____

MULTIPLE ALIGNMENT

3) Fill the table below, by calculating all pairwise global alignment scores among three sequences : Seq1=CTAGCAG, Seq2=CATGCAG, and Seq3=CAGTTG.

Pairwise alignments are given below.

Use score constants of, Match = +2, Mismatch = -1, Gap = -1 (Linear Gap).

Seq1 : CTAGCAG

|..| | | |

Seq2 : CATGCAG

score=

Seq1 : CTAGCAG

| | | .. |

Seq3 : C-AGTTG

score=

Seq2 : CATGCAG

| | | .. |

Seq3 : CA-GTTG

score=

	Seq 1	Seq 2	Seq 3	Sum
Seq 1				
Seq 2				
Seq 3				

Ans. _____

4) Calculate a multiple alignment of the three sequences shown in 3), by using the Star method. Choose the sequence with maximum “Sum” in the table in 3), as the Star sequence. Use the Star sequence as a pivot, and combine pairwise alignments with it to get a final multiple alignment. If you have several candidates for the Star sequence, show all cases.

Star sequence =

Multiple alignment :

Seq1 :

Seq2 :

Seq3 :

Ans. _____