2015556071 - MUSTAFA YUMURTACI

COMPUTATIONAL BIOLOGY AND ADVANCED TOPICS

HOMEWORK 4

a) Given sequence A of length n and sequence B of length m, how many possible alignments are there? Give an expression in n and m. Here, A is the first sequence; B is the second sequence. Report the sample possibilities for the entered A and B sequences in a pdf file.

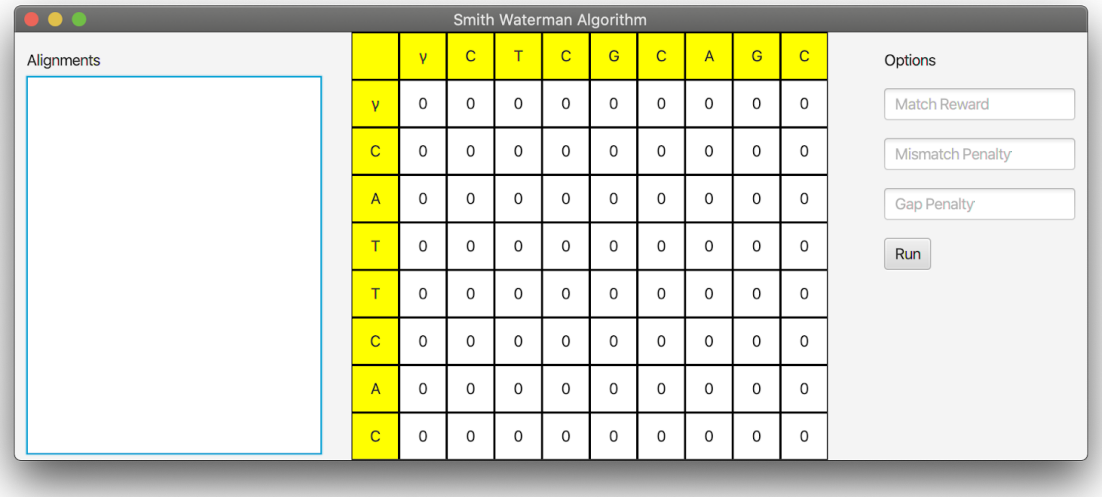
Answer:

$$(m+n)!/m!*n!$$

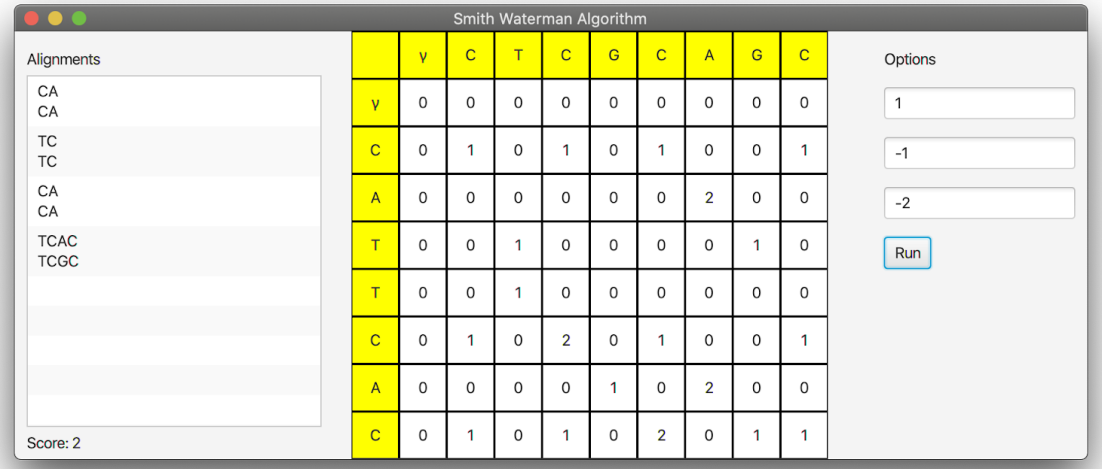
Let's say A sequence defined as CAT and B sequence defined as TAG. In this case, if we calculate the formula above with m=3 and n=3, we get 20. So there are 20 possible alignments in this case.
Sample possible 2 alignments:

A	T
*	*
A	T

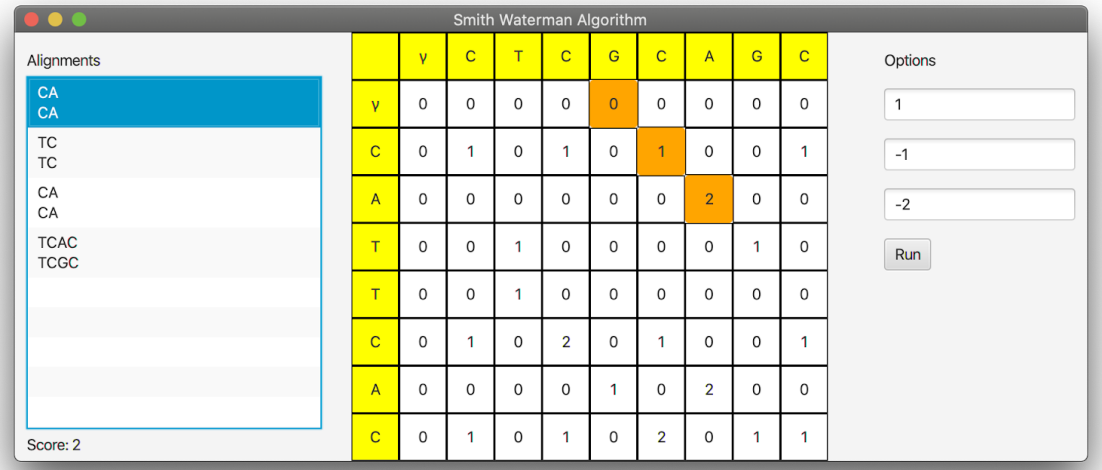
b) Example program output:



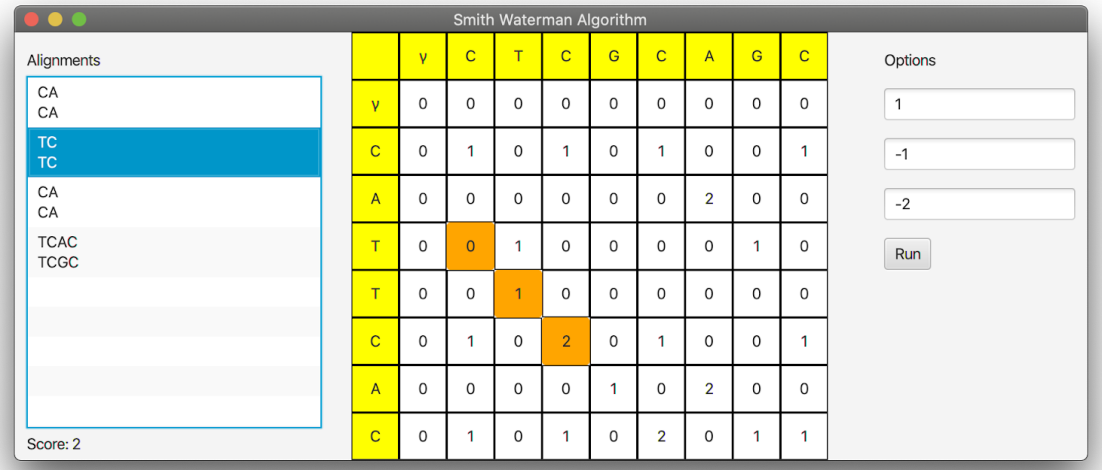
	v	C	T	C	G	C	A	G	C
v	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0
A	0	0	0	0	0	0	0	0	0
T	0	0	0	0	0	0	0	0	0
T	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0
A	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0



	γ	C	T	C	G	C	A	G	C
γ	0	0	0	0	0	0	0	0	0
C	0	1	0	1	0	1	0	0	1
A	0	0	0	0	0	0	2	0	0
T	0	0	1	0	0	0	0	1	0
T	0	0	1	0	0	0	0	0	0
C	0	1	0	2	0	1	0	0	1
A	0	0	0	0	1	0	2	0	0
C	0	1	0	1	0	2	0	1	1



	γ	C	T	C	G	C	A	G	C
γ	0	0	0	0	0	0	0	0	0
C	0	1	0	1	0	1	0	0	1
A	0	0	0	0	0	0	2	0	0
T	0	0	1	0	0	0	0	1	0
T	0	0	1	0	0	0	0	0	0
C	0	1	0	2	0	1	0	0	1
A	0	0	0	0	1	0	2	0	0
C	0	1	0	1	0	2	0	1	1



	γ	C	T	C	G	C	A	G	C
γ	0	0	0	0	0	0	0	0	0
C	0	1	0	1	0	1	0	0	1
A	0	0	0	0	0	0	2	0	0
T	0	0	1	0	0	0	0	1	0
T	0	0	1	0	0	0	0	0	0
C	0	1	0	2	0	1	0	0	1
A	0	0	0	0	1	0	2	0	0
C	0	1	0	1	0	2	0	1	1