2015556071 - MUSTAFA YUMURTACI

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.

Answer:

$$\sum_{x=n-m}^{n} = \frac{(x+m)!}{x!(x+m-n)!(n-x)!}$$

b) Example program output:

```
mustafayumurtaci@Mustafas-MacBook-Pro: ~/Workspace/Needleman...  ⌥⌘1
➜  NeedlemanWunsch git:(master) ✗ dotnet run
Solution matrix:
               T       A       T       A       G       C
       0       -5      -10     -15     -20     -25     -30
G      -5      -3      -8      -13     -18     -15     -20
T      -10     0       -5      -3      -8      -13     -18
T      -15     -5      -3      0       -5      -10     -15
A      -20     -10     0       -5      5       0       -5
T      -25     -15     -5      5       0       2       -3
C      -30     -20     -10     0       2       -3      7

Obtained score: 7
Number of backtraces: 1

All possible alignments:
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GT-TATC
-TATAGC
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Execution time: 5 milliseconds

➜  NeedlemanWunsch git:(master) ✗
```