

Sequence Analysis 3
Summer 2024

Exercises

Number 7, Discussion: 2024-June-13

1. Draw all 13 global alignments resp. all 6 equivalence relations of global effective alignments of the two sequences $x = AB$ and $y = CD$.
2. What is the number of global alignments of two sequences of lengths $m = 4$ and $n = 2$, and what is the number for $m = n = 8$?
3. What is the number of equivalence relations of global effective alignments of two sequences of lengths $m = 4$ and $n = 2$, and what is the number for $m = n = 8$?
4. Write a program in the language of your choice that
 - (a) computes $N(m, n)$ recursively,
 - (b) computes $N(n, n)$ approximately,
 - (c) computes $N'(m, n)$ exactly, and
 - (d) computes $N'(m, n)$ approximately.

Run your program for the input $n = m \in \{1, 5, 10, 100\}$ and compare the results. Discuss the difference between $N(m, n)$ and $N'(m, n)$.