

DP for RNA Secondary Structure Prediction

Problem

We are given the following RNA sequence: AAUCGAUCGCAAGCA

$$S(i,j) = \max \begin{cases} S(i+1, j-1) + 1 & \text{[if } i, j \text{ base pair]} \\ S(i+1, j) \\ S(i, j-1) \\ \max_{i < k < j} S(i, k) + S(k+1, j) \end{cases}$$

What structure will Nussinov's algorithm produce? The table is already filled except for 9 squares. Fill in the 9 squares and draw an optimal solution. Show all the arrows that correspond to your solution.

	A	A	U	C	G	A	U	C	G	C	A	A	G	C	A
A	0	0	1	1	2	2	3	3	4	4	4	4			
A	0	0	1	1	2	2	3	3	4	4	4	4			
U		0	0	0	1	2	2	2	3	3	4	4			
C			0	0	1	1	2	2	3	3	3	3	4	4	4
G				0	0	0	1	2	2	3	3	3	3	4	4
A					0	0	1	1	2	2	2	2	3	3	3
U						0	0	0	1	1	2	2	2	3	3
C							0	0	1	1	1	1	2	2	2
G								0	0	1	1	1	1	2	2
C									0	0	0	0	1	1	1
A										0	0	0	0	1	1
A											0	0	0	1	1
G												0	0	1	1
C													0	0	0
A														0	0