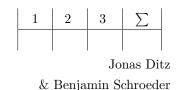
Bioinformatics I

WS 15/16

Tutor: Alexander Seitz



Assignment 4

(Abgabe am 9. November 2015)

Theoretical Assignment - Optimal multiple alignment

To calculate our MSA we use the recursion written down on page 50 in the script.

$$F(i_1-1,i_2-1,i_3-1) + s_{SP}(a_{1i_1},a_{2i_2},a_{3i_3})$$

$$F(i_1-1,i_2-1,i_3) + s_{SP}(a_{1i_1},a_{2i_2},-)$$

$$F(i_1-1,i_2,i_3-1) + s_{SP}(a_{1i_1},-,a_{3i_3})$$

$$F(i_1,i_2-1,i_3-1) + s_{SP}(-,a_{2i_2},a_{3i_3})$$

$$F(i_1-1,i_2,i_3) + s_{SP}(a_{1i_1},-,-)$$

$$F(i_1,i_2-1,i_3) + s_{SP}(-,a_{2i_2},-)$$

$$F(i_1,i_2,i_3-1) + s_{SP}(-,-,a_{3i_3})$$

If we fill the DP matrix using this recursion, we get the following MSA:

$$\begin{pmatrix}
C & T & T \\
- & T & C \\
C & C & T
\end{pmatrix}$$
(1)

with score $\alpha_{SP}(A^*) = S(A, B) + S(A, C) + S(B, C) = -2 + 2 + (-6) = -6$.

Theoretical Assignment - Progressive alignment

Practical Assignment - Comparing multiple alignment