Introduction to Bioinformatics

Assignment #1

Part (4):

Sequence (1): CTATTGAACAT

Global Alignment:

Sequence (2): CTATTGACGTAACAT

Gap Score:	-3
Match Score	
Mismatch Score:	1

 $S_{0,0} = Max(0+4,-3-3,-3-3) = Max(4,-6,-6) = 4$

 $S_{0,1} = Max(-3-1,-6-3,4-3) = Max(-4,-9,1) = 1$

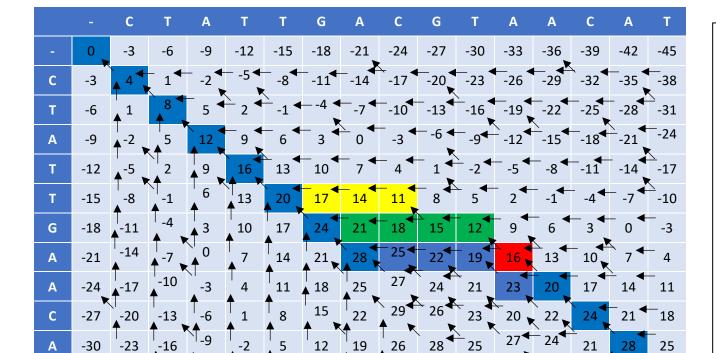
 $S_{0,2} = Max(-6-1,-9-3,1-3) = Max(-7,-12,-2) = -2$

 $S_{0,3} = Max(-9-1,-12-3,-2-3) = Max(-10,-15,-5) = -5$

 $S_{0,4} = Max(-12-1,-15-3,-5-3) = Max(-13,-18,-8) = -8$

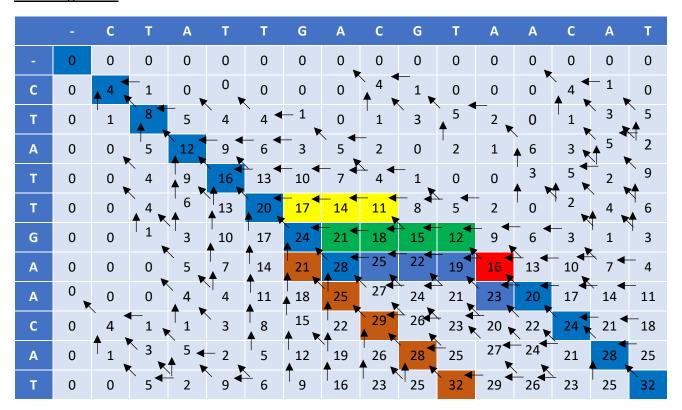
 $S_{0,5} = Max(-15-1,-18-3,-8-3) = Max(-16,-21,-11) = -11$

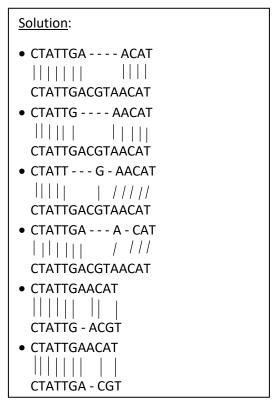
And so on...



Solution: CTATTGA - - - - ACAT | | | | | | | | | | CTATTGACGTAACAT CTATTG - - - - AACAT | | | | | | | | | | CTATTGACGTAACAT CTATTGACGTAACAT CTATTGACGTAACAT CTATTGACGTAACAT CTATTGACGTAACAT CTATTGA - - - A - CAT | | | | | | | | | | | | CTATTGACGTAACAT

Local Alignment:





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S_{0,0} = \text{Max}(0+4,0-3,0-3,0) = \text{Max}(4,-3,-3,0) = 4
S_{0,1} = \text{Max}(0-1,0-3,4-3,0) = \text{Max}(-1,-3,1,0) = 1
S_{0,2} = \text{Max}(0-1,0-3,1-3,0) = \text{Max}(-1,-3-2,0) = 0
S_{0,3} = \text{Max}(0-1,0-3,0-3,0) = \text{Max}(-1,-3,-3,0) = 0
S_{0,4} = \text{Max}(0-1,0-3,0-3,0) = \text{Max}(-1,-3,-3,0) = 0
S_{0,5} = \text{Max}(0-1,0-3,0-3,0) = \text{Max}(-1,-3,-3,0) = 0
S_{0,6} = \text{Max}(0-1,0-3,0-3,0) = \text{Max}(-1,-3,-3,0) = 0
S_{0,7} = \text{Max}(0+4,0-3,0-3,0) = \text{Max}(4,-3,-3,0) = 4
And so on...
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