

Sequence 1: **ATTGC**

Sequence 2: **AGTTC**

(j)

(i)

| | | A | G | T | T | C |
|---|-----|----|----|----|----|-----|
| | 0 | -2 | -4 | -6 | -8 | -10 |
| A | -2 | +2 | 0 | -2 | -4 | -6 |
| T | -4 | 0 | +1 | +2 | 0 | -2 |
| T | -6 | -2 | -1 | +3 | +4 | +2 |
| G | -8 | -4 | 0 | +1 | +2 | +3 |
| C | -10 | -6 | -2 | -1 | 0 | +4 |

Q18. Using a match score of 2, a mismatch score of -1, and a gap score of -2. Fill in the table and translate it into a alignment. What is the optimal score for this alignment? Is there one unique alignment with this score?

| | j | | | | |
|--------------|--|--------------|------------|------------|----------|
| i | <table> <tr> <td>$(i-1, j-1)$</td><td>$(i-1, j)$</td></tr> <tr> <td>$(i, j-1)$</td><td>S_{ij}</td></tr> </table> | $(i-1, j-1)$ | $(i-1, j)$ | $(i, j-1)$ | S_{ij} |
| $(i-1, j-1)$ | $(i-1, j)$ | | | | |
| $(i, j-1)$ | S_{ij} | | | | |

$$\begin{aligned}
 & \rightarrow S_{i-1, j-1} + \begin{cases} \text{MATCH (2)} \\ \text{OR} \\ \text{MISMATCH (-1)} \end{cases} \\
 & \downarrow S_{i-1, j} + \text{GAP (-2)} \\
 & \rightarrow S_{i, j-1} + \text{GAP (-2)}
 \end{aligned}$$

Q19. What one part of this lab or associated lecture material is still confusing?
If appropriate please also indicate the question number from this lab instruction pdf and answer the question in the following anonymous form: <http://tinyurl.com/bioinfo525-lab2>

A T T G C
| | | | |
A G T T C

A - T T G C
| | | | |
A G T T - C