**Needleman-Wunsch worksheet**

**Value for each cell is maximum of: Scoring system:**

|  |  |  |  |
| --- | --- | --- | --- |
| **Up**: | Value from cell above + gap cost | Match | +1 |
| **Left**: | value from cell to left + gap cost | Mismatch | -1 |
| **Diag**: | value from cell above-left + match reward OR mismatch cost | Gap | -1 |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  | This cell |  |  |  |  |  |  |  |  |  |
|  | Is always |  | Left |  | Left |  | Left |  | Left |  |
|  | Zero |  |  |  |  |  |  |  |  |  |
|  | Up |  | Up |  | Up |  | Up |  | Up |  |
|  |  |  | Left |  | Left |  | Left |  | Left |  |
|  |  |  | Diag |  | Diag |  | Diag |  | Diag |  |
|  | Up |  | Up |  | Up |  | Up |  | Up |  |
|  |  |  | Left |  | Left |  | Left |  | Left |  |
|  |  |  | Diag |  | Diag |  | Diag |  | Diag |  |
|  | Up |  | Up |  | Up |  | Up |  | Up |  |
|  |  |  | Left |  | Left |  | Left |  | Left |  |
|  |  |  | Diag |  | Diag |  | Diag |  | Diag |  |