# Semi-global alignment

## *Traditional* dynamic programming table

|  |  | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  | **M** | – | A | G | G | T | A | T | C | G | C |
| 0 | – | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | A | 1 | 0 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| 2 | T | 2 | 1 | 1 | 2 | 1 | 1 | 0 | 1 | 2 | 2 |
| 3 | G | 3 | 2 | 1 | 1 | 2 | 2 | 1 | 1 | 1 | 2 |
| 4 | G | 4 | 3 | 2 | 1 | 2 | 3 | 2 | 2 | 1 | 2 |
| 5 | C | 5 | 4 | 3 | 2 | 2 | 3 | 3 | 2 | 2 | 1 |

$d = 2$

## *Alternate* dynamic programming table

$d$ (column headers), $e$ (row labels)

| $c$ | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| $e = -1$ |  |  | $-\infty$ | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
| $e = 0$ |  | $-\infty$ | -1 | 1 | 1 | 2 | 3 | 6 | 5 | 6 |  |
| $e = 1$ | $-\infty$ | -1 | 3 | 3 | 2 | 4 | 6 | 9 | 8 |  |  |
| $e = 2$ | -1 | 3 | 4 | 4 | 4 | 7 | 8 | 9 |  |  |  |

$C(e,d)$ = last column in **M** on $d$-diagonal that contains $e$ edits.

$C(1,2) = 4$