

## Levenshtein Distance Worksheet

(based on, and thanks to, Michael

Gillelad

<http://www.merriampark.com/d.htm>)

| Step | Description  |
|------|--|
| 1    | Set $n$ to be the length of $s$ .<br>Set $m$ to be the length of $t$ .<br>If $n = 0$ , return $m$ and exit.<br>If $m = 0$ , return $n$ and exit.<br>Construct a matrix containing $0..m$ rows and $0..n$ columns.  |
| 2    | Initialize the first row to $0..n$ .<br>Initialize the first column to $0..m$ .  |
| 3    | Examine each character of $s$ ( $i$ from 1 to $n$ ).   |
| 4    | Examine each character of $t$ ( $j$ from 1 to $m$ ).   |
| 5    | If $s[i]$ equals $t[j]$ , the cost is 0.<br>If $s[i]$ doesn't equal $t[j]$ , the cost is 1. (and note in upper left of each cell)  |
| 6    | Set cell $d[i,j]$ of the matrix equal to the minimum of:<br>a. The cell immediately above plus 1: $d[i-1,j] + 1$ .<br>b. The cell immediately to the left plus 1: $d[i,j-1] + 1$ .<br>c. The cell diagonally above and to the left plus the cost: $d[i-1,j-1] + \text{cost}$ . |
| 7    | After the iteration steps (3, 4, 5, 6) are complete, the distance is found in cell $d[n,m]$ .  |

|   |   | C | A | T |
|---|---|---|---|---|
| R | 0 | 1 | 2 | 3 |
| A | 1 | 1 | 2 | 3 |
| T | 2 | 2 | 1 | 2 |
|   | 3 | 3 | 2 | 1 |

|   | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| 0 |   |   |   |   |   |   |   |
| 1 |   |   |   |   |   |   |   |
| 2 |   |   |   |   |   |   |   |
| 3 |   |   |   |   |   |   |   |
| 4 |   |   |   |   |   |   |   |
| 5 |   |   |   |   |   |   |   |
| 6 |   |   |   |   |   |   |   |