

5. Minimum Edit distance

two string X of length n
 Y of length m

$$DC(i, 0) = i$$

$$DC(0, j) = j$$

for $i = 1$ to M for $j = 1$ to N

$$DC(i, j) = \begin{cases} DC(i-1, j) + 1 \\ DC(i, j-1) + 1 \\ DC(i-1, j-1) + 2 & \text{if } X[i] \neq Y[j] \\ 0 & \text{if } X[i] = Y[j] \end{cases}$$

[$DC(n, m)$ is distance]

		T	r	a	n	s	i	t	i	o	n
	①	1	2	3	4	5	6	7	8	9	10
O	1	①	2	3	4	5	6	7	8	8	9
c	2	2	②	3	4	5	6	7	8	9	9
c	3	3	3	③	4	5	6	7	8	9	10
u	4	4	4	4	④	5	6	7	8	9	10
p	5	5	5	5	5	⑤	6	7	8	9	10
a	6	6	6	5	6	6	⑥	7	8	9	10
t	7	⑥	7	6	6	7	7	⑥	7	8	9
i	8	7	7	7	7	7	7	7	⑥	7	8
o	9	8	8	8	8	8	8	8	7	⑥	7
n	10	9	9	9	8	9	9	9	8	7	⑥

Levenshtein Distance = ⑥

(Backtracking)

Occupation



Occupation

Occupation

Occupation

Occupation

Occupation

→ Transition

(Transition ✓)

(O → T)

(C → r)

(c → a)

(u → n)

(p → s)

(a → i)

[6 steps]

⇒

0

	O	C	c	u	p	a	r	T	
O	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0
c	0	0	0	0	0	0	0	0	0
u	0	0	0	0	0	0	0	0	0
p	0	0	0	0	0	0	0	0	0
a	0	0	0	0	0	0	0	0	0
r	0	0	0	0	0	0	0	0	0
T	0	0	0	0	0	0	0	0	0