

* Edit Distance

word 1 $\xrightarrow{\text{to}}$ word 2
 $\rightarrow w_1$

		i	n	t	e	n	t	i	o	n	
		0	1	2	3	4	5	6	7	8	9
dw2	e	1	2	3	3	4	5	6	7	8	
	x	2	2	2	3	4	4	5	6	7	8
	e	3	3	3	3	3	4	5	6	7	8
	c	4	4	4	4	4	4	5	6	7	8
	u	5	5	5	5	5	5	5	6	7	8
	t	6	6	6	5	6	6	5	6	7	8
	i	7	6	7	6	6	7	6	5	6	7
	o	8	7	7	7	7	7	7	6	5	6
	n	9	8	7	8	8	7	8	7	6	5

inten $\rightarrow e = 4$

inte $\rightarrow e = 4$

inte $\rightarrow e = 3 + 1$

$O(mn)$
 $O(m \times n)$

if $w_1[i] = w_2[j]$

$$dp[i][j] = dp[i-1][j-1]$$

take diagonal

else

replace $w_1[i-1]$ by $w_2[j-1]$

$$dp[i][j] = \min(dp[i-1][j], dp[i-1][j-1], dp[i][j-1]) + 1$$

delete $w_1[i-1]$

$dp[i][j-1] + 1$

insert $w_2[j-1]$ to w_1

$O(mn)$
 $O(m \times n)$

can be done in $O(n)$ by using 1D array.

~~rep~~ $w_1 = abcde$
 $w_2 = fghie$

In case of abcd
fgh

1) replace e by i

abcde \rightarrow e...i \Rightarrow abcd i
fghi \rightarrow i i \Rightarrow fghi

$dp[i-1][j]+1$

+1

2) delete e

abcd e
fghi

\Rightarrow abcd
 \Rightarrow fgh

$dp[i-1][j]+1$

3) insert i

abcde \Rightarrow abcdei
fghi \Rightarrow fghi

$dp[i][j-1]+1$