4th March

04 March 2022 19:07

Edit Distance :- https://leetcode.com/problems/edit-distance/

S1 ⇒ S2

horse ⇒ ros

↳ Min. no. of operations to convert S1 into S2.

Operations :-

- Insert a character ✓
- Delete a character ✓
- Replace a character ✓

abcdefg , abcdefgh

S1 S2

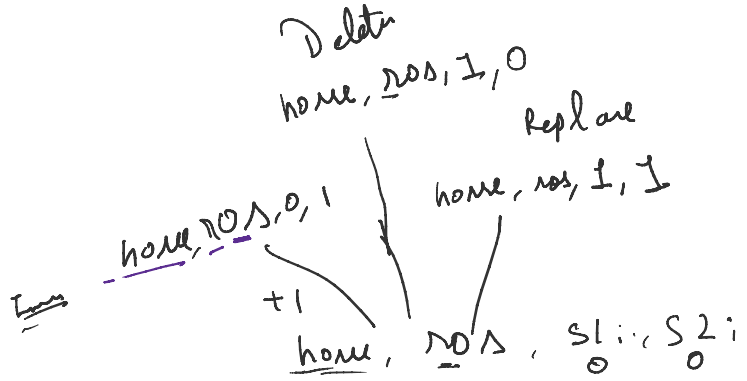
horse , ros

'h' == 'r'

⇒ Insert :- rhorse , ros = 1

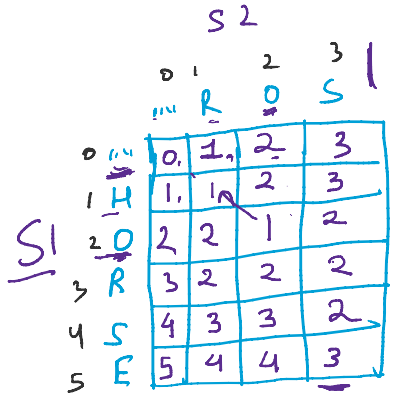
⇒ Delete :- horse , ros ⇒ 3

⇒ Replace :- rorse , ros



Tabulation :- ROS

HORSE



HORSE ROS

$\left(\begin{matrix}\nwarrow & \uparrow \\ \leftarrow & 1,1\end{matrix}\right) + 1$

H ⇒ RO [1,2]

Ins ⇒ Hϕ ⇒ Rϕ [1,1]

Delete ⇒ ϕ ⇒ RO [0,2]

Replace ϕ,, ⇒ Rϕ [0,1]

2,2 ⇒ (1,1)

Hϕ ⇒ Rϕ [0,1]

Hϕ ⇒ Rϕ

" " " "

" " R

" " RO

" " ROS

H ⇒ " "

HO ⇒ " "

HOR " "

$\cancel{H}\,\cancel{\phi} \Rightarrow \cancel{R}\,\cancel{R}$ (0,1) $\quad \cancel{H}\,\cancel{\phi} \Rightarrow \cancel{R}\,\cancel{\phi}$

Insert [$H\,\cancel{R} \Rightarrow \cancel{R}$
$\cancel{H} \Rightarrow$ " " (1,0)

Deletion [$\cancel{H} \Rightarrow R$
" " $\Rightarrow R$ (0,1)

Replace [$\cancel{H}\,\cancel{R} \Rightarrow \cancel{R}$
" " $\Rightarrow$ " " (0,0)

$\cancel{H}\,R \qquad R$

Minimum No. of coins to Make amount: https://leetcode.com/problems/coin-change/

coins = [1, 2, 5], amount = 11

dp =

i \ j	0	1	2	3	4	5	6	7	8	9	10	11
1	0	1	2	3	4	5	6	7	8	9	10	11
2	0	1	1	2	2	3	3	4	4	5	5	6
5	0	1	1	2	2	1	2	2	3	5	2	3

$\Rightarrow 3$

1-5

$3-2=1$ $\quad 2-2=0$

$(1+1), 3$

min $((0+1)(2))$

$4-2=2$
$(1+1), 4$

j (coins[i] $\leq j$)

dp[i] [j - coins[i]]

[3, 5] $\quad$ amount = 7

	0	1	2	3	4	5	6	7
3	0	∞	∞	1	∞	∞	2	∞
5	0	∞	∞	1	∞	1	2	∞

	0	1	2	3
2		∞	∞	∞