

Edit Distance

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CSX3009 Algorithm Design

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Minimum Edit Distance

- Given two strings A and B (i.e., two sequences of characters).
- Goal: Find the minimum number of edits to transforms s_1 to s_2 .
- Edit operations include:
 - Insertion
 - Deletion
 - Substitution

Example

F	O	O	D		
M	O	N	E	Y	
S		S	S	I	

4 edits

	F	O	O	D	
M	O	N	E	Y	
I	S	S	S	S	

5 edits

F	O	O	D		
M	O	N	E	Y	
D	S		S	I	I

5 edits

F		O	O	D	
M	O	N	E	Y	
S	I	S	S	S	

4 edits

F	O		O	D	
M	O	N	E	Y	
S		I	S	S	

4 edits

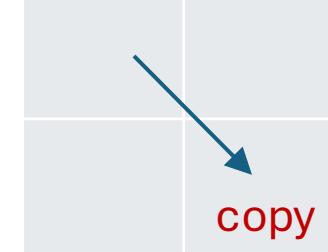
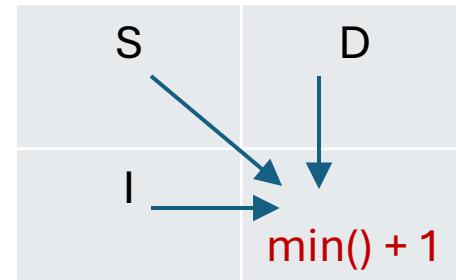
F	O	O		D	
M	O	N	E	Y	
S		S	I	S	

4 edits

Example

if $A[i] \neq B[j]$

if $A[i] = B[j]$

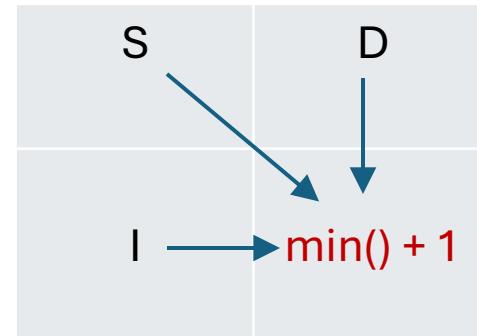


The diagram shows two arrays, A and B, being compared character by character. Array A (Source) is shown as a 5x7 grid with rows labeled F, O, O, D and columns labeled 0 through 5. Array B (Destination) is shown as a 5x7 grid with columns labeled M, O, N, E, Y. A curly brace on the left indicates that array A spans the first four rows. A bracket above the second column indicates that array B spans the first five columns. A blue arrow points from the 'F' row of array A to the 'M' column of array B, indicating the current comparison step.

		M	O	N	E	Y
	0	1	2	3	4	5
F	1					
O	2					
O	3					
D	4					

Example

if $A[i] \neq B[j]$



if $A[i] = B[j]$



		M	O	N	E	Y
	0	1	2	3	4	5
F	1	1	2	3	4	5
O	2	2	1	2	3	4
O	3	3	2	2	3	4
D	4	4	3	3	3	4

Recursion Tree

