ISTANZA

$X = \langle x_1 \dots x_n \rangle \qquad |x| = n$

$Y = \langle y_1 \dots y_m \rangle \qquad |y|\ m$

Soluzione

$Z = \{ W \mid \max(|W_i|)$ sottoseq. di X ed $Y \}$

$\boxed{\text{SOTTOPROBLEMI}}$

- $i \to$ indice di lunghezza di $X_i \subseteq X$
- $J \to$ " " $Y_J \subseteq Y$
- $(i, J) \to X_i, Y_J$

$S_{iJ} \Rightarrow$ più lunga LCS

X_i e $Y_J \subseteq X, Y$

$S_{0,0} \quad S_{1,0} \quad S_{0,1} \quad \boxed{S_{1,1}} \dots \quad S_{\underbrace{n-1}_{i},\ \underbrace{m-1}_{J}}$

$S_{n,m} = S_{n-1,m-1} + \dots \underbrace{S(0,0)}$

$\boxed{\text{Caso base}}$

$\langle \dots \rangle$

$\langle \ \rangle$

X e Y

$S_{0,0}$, $S_{0,J}$, $S_{i,0}$ $\Rightarrow$ LCS $\to$ $0,J$ / $i,0$ $\Rightarrow \langle \ \rangle$

$X_i = \langle a, b, c, \boxed{d} \rangle$

$Y_J = \langle x, y, z, \boxed{d} \rangle$

S_{ij}

Caso passo → $X_i \Rightarrow$ $x_i = y_J$ ← $y_J \Rightarrow$ → $S_{ij} = S_{i-1,j-1} \cup \{x_i = y_J\} + \langle d \rangle + \dots$

$x_i \neq y_J$ → $S_{iJ} = S_{i-1,J}$; $S_{iJ} = S_{i,J-1}$

abcde x

abcde

⟨a, b, c, d, e, x⟩

⟨a, b, c, d, e, f⟩

abcde

abcde

abcde x

abcde

a, b, c, d, e

abcde f

f

f

$\max(S_{iJ-1}, S_{i-1,J})$

C.B.

Se $i = 0 \lor J = 0 \to X_0 \lor Y_0$

$S_{0J} \lor S_{i0} \to \langle \varepsilon \rangle$

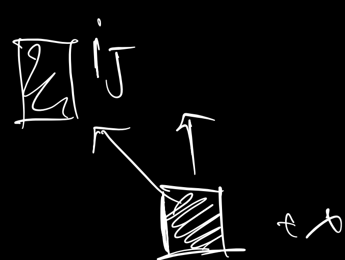
Se $i \neq 0 \land J \neq 0 \to x_i \land y_J$

Se $x_i = y_j \to S_{ij} = \max\{S_{i-1,j}, S_{ij-1}\}$

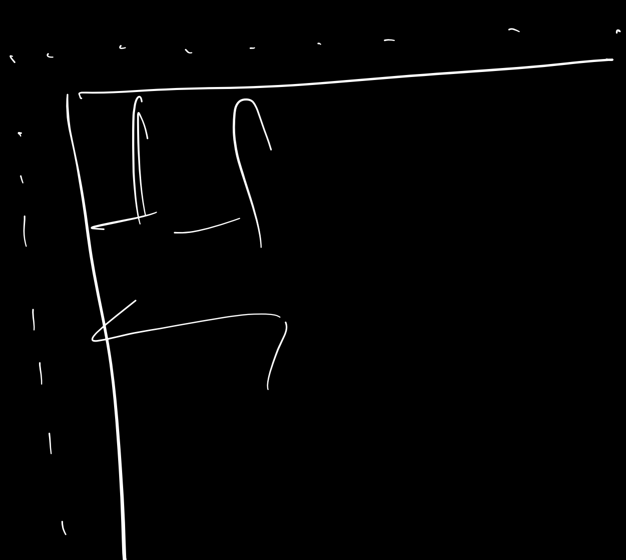
Altrim. $S_{ij} = S_{i-1,j-1} \cup \{x_i\}$

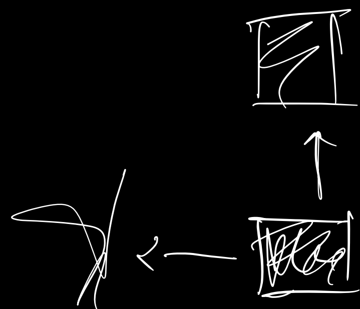
$i \Rightarrow 0 \to n \to$ lungh. di pref. della comp. X

$j \to m$ Y



$M_{i \times j}$:





Algoritmo :

per $i=0$ to n

$M[i][0]=0$

for . . . . .

$M[0][j]=0$

For $i \rightarrow 0$

for $j \longrightarrow 0$ $\quad x_i, y_j$

if $x_i = y_j \rightarrow C \rightarrow M_{i-1,j-1} + 1$

if $x_i \neq y_j$

$\hookrightarrow$ max $\{ M_{i-1,j} \wedge M_{i,j-1} \}$

Mmm

$\rightarrow$ risultato