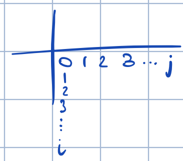
PROB DIN

LCS

$$c[i,j] = \begin{cases} 0 & i=0 \text{ OR } j=0 \\ c[i-1,j-1]+1 & i,j>0 \text{ AND } x_i = y_j \\ \max\left(c[i,j-1],\, c[i-1,j]\right) & i,j>0 \text{ AND } x_i \neq y_j \end{cases}$$

EDIT-D

$$c[i,j] = \begin{cases} i & j=0 \\ j & i=0 \\ \min\left(c[i,j-1]+1,\ c[i-1,j]+1,\ c[i-1,j-1]+p(i,j)\right) & i,j>0 \end{cases}$$



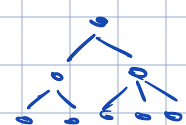
$$p(i,j) = \begin{cases} 0 & x_i = y_j \\ 1 & x_i \neq y_j \end{cases}$$

per ricostruire le stringhe tengo conto ad ogni scelta.

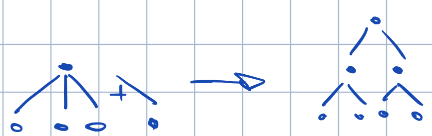
$$\begin{cases} \uparrow = \dfrac{-}{\text{char}} \\ \leftarrow = \dfrac{\text{char}}{-} \\ \nwarrow = \dfrac{\text{char}}{\text{char}} \end{cases}$$

2-3 Alberi

- $2^{h+1} - 1 \leq n \leq \dfrac{3^{h+1} - 1}{2}$
- $2^h \leq f \leq 3^h$



$h = 2$
$n = 8$
$f = 5$

split: 

fuse: 

$$\left.\begin{array}{l} \text{SRC} \\ \text{INS} \\ \text{DEL} \end{array}\right\} = O(\log n) \text{ al caso peggiore.}$$

garantito dal bilanciamento.

Master Theorem

$T(n) = aT\left(\frac{n}{b}\right) + f(n)$

$f(n)$ vs. $n^{\log_b a}$

- $f(n) < n^{\log_b a}$ | $f(n) = O(n^{\log_b a - \varepsilon})$ | $f(n) \leq c \cdot n^{\log_b a - \varepsilon}$ $\Rightarrow T(n) = \Theta(n^{\log_b a})$
- $f(n) \sim n^{\log_b a}$ | $f(n) = \Theta(n^{\log_b a})$ | $c_1 \cdot n^{\log_b a} \log^k \leq f(n) \leq c_2 \cdot n^{\log_b a} \log^k$ $\Rightarrow T(n) = \Theta(n^{\log_b a} \cdot \log^{k+1} n)$
- $f(n) > n^{\log_b a}$ | $f(n) = \Omega(n^{\log_b a + \varepsilon})$ | $\begin{cases} f(n) \geq c \cdot n^{\log_b a + \varepsilon} \\ a f(\frac{n}{b}) \leq c \cdot f(n) \quad c<1 \end{cases}$ $\Rightarrow T(n) = \Theta(f(n))$

Tabelle Hash

	Ricerca senza successo	Ricerca con successo	Inserimento
Chaining	$1 + \lambda$	$1 + \lambda$	1
Open Addressing	$\frac{1}{1-\lambda}$	$\frac{1}{\lambda} \ln \frac{1}{1-\lambda}$	$\frac{1}{1-\lambda}$

- divisione : $K \% m$
- moltiplicazione: $\lfloor m (KA \% 1) \rfloor$ $0 < A < 1$

OPEN ADDRESSING

- lineare : $h(K, i) = (h'(K) + i) \% m$
- quadratico : $h(K, i) = (h'(K) + c_1 i + c_2 i^2) \% m$
- doppio : $h(K, i) = (h_1(K) + i h_2(K)) \% m$
  - $h_1(K) = K \% m$
  - $h_2(K) = 1 + K \% (m-1)$