

Subsir comun maximal

Ex.

$a[1..n]$
 8 1 5 7 5 4
 $b[1..m]$
 2 1 2 3 4 5 8 7

(The sequence a has elements 8, 1, 5, 7, 5, 4. The sequence b has elements 2, 1, 2, 3, 4, 5, 8, 7. In the original image, the 1, 5, 7 in a and the 1, 5, 8, 7 in b are circled in red. A bracket under the first three elements of a is labeled $i=3$. A bracket under the first six elements of b is labeled $j=6$. The element 8 in b is crossed out with a blue line.)

$e(i, j)$ = lung. maximă a subșirului
 maximal comun pt $\begin{cases} a[1..i] \\ b[1..j] \end{cases}$

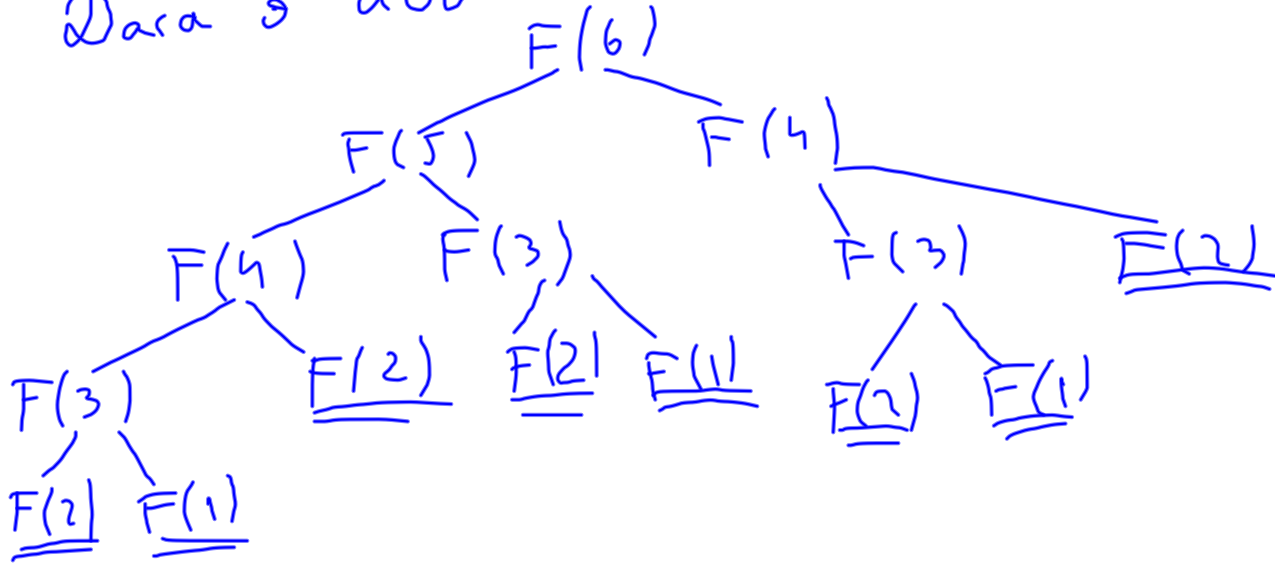
$$e(i, j) = \begin{cases} e(i-1, j-1) + 1 & \text{dacă } a[i] = b[j] \\ \max(e(i-1, j), e(i, j-1)) & \text{dacă } a[i] \neq b[j] \\ 0 & \text{dacă } i=0 \text{ sau } j=0 \end{cases}$$

Programare dinamică

Trebuie găsită o relație de recurență care
se implementează de jos în sus.

Ex - Sirul lui Fibonacci : $F(n) = F(n-1) + F(n-2)$
 Dară o abordare de sus în jos:
 $F(6)$

Ex: $\frac{1}{2} \max$
Dada o abradam de sus in jos:
 $E(6)$



Abordare de jos în sus:

$$F(1) = 1$$

$$F(2) = 1$$

$$F(3) = F(2) + F(1) = 2$$

$$F(4) = F(3) + F(2) = 3$$

$$F(5) = F(4) + F(3) = 3 + 2 = 5$$

$$F(6) = F(5) + F(4) = 5 + 3 = 8$$

| | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|--|
| 8 1 5 7 5 4 | | | | | | | | | | |
| 2 1 2 3 4 5 8 7 | | | | | | | | | | |
| <div> <div>2</div> <div>1</div> <div>2</div> <div>3</div> <div>4</div> <div>5</div> <div>8</div> <div>7</div> </div> | | | | | | | | | | |
| $i \backslash j$ | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 8 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | |
| 1 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | |
| 5 3 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 2 | |
| 7 4 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | |
| 5 5 | 0 | 0 | 1 | 1 | 1 | 1 | 2 | 2 | 3 | |
| 4 6 | 0 | 0 | 1 | 1 | 1 | 2 | 2 | 2 | 3 | |

Longest subseq. maximal common