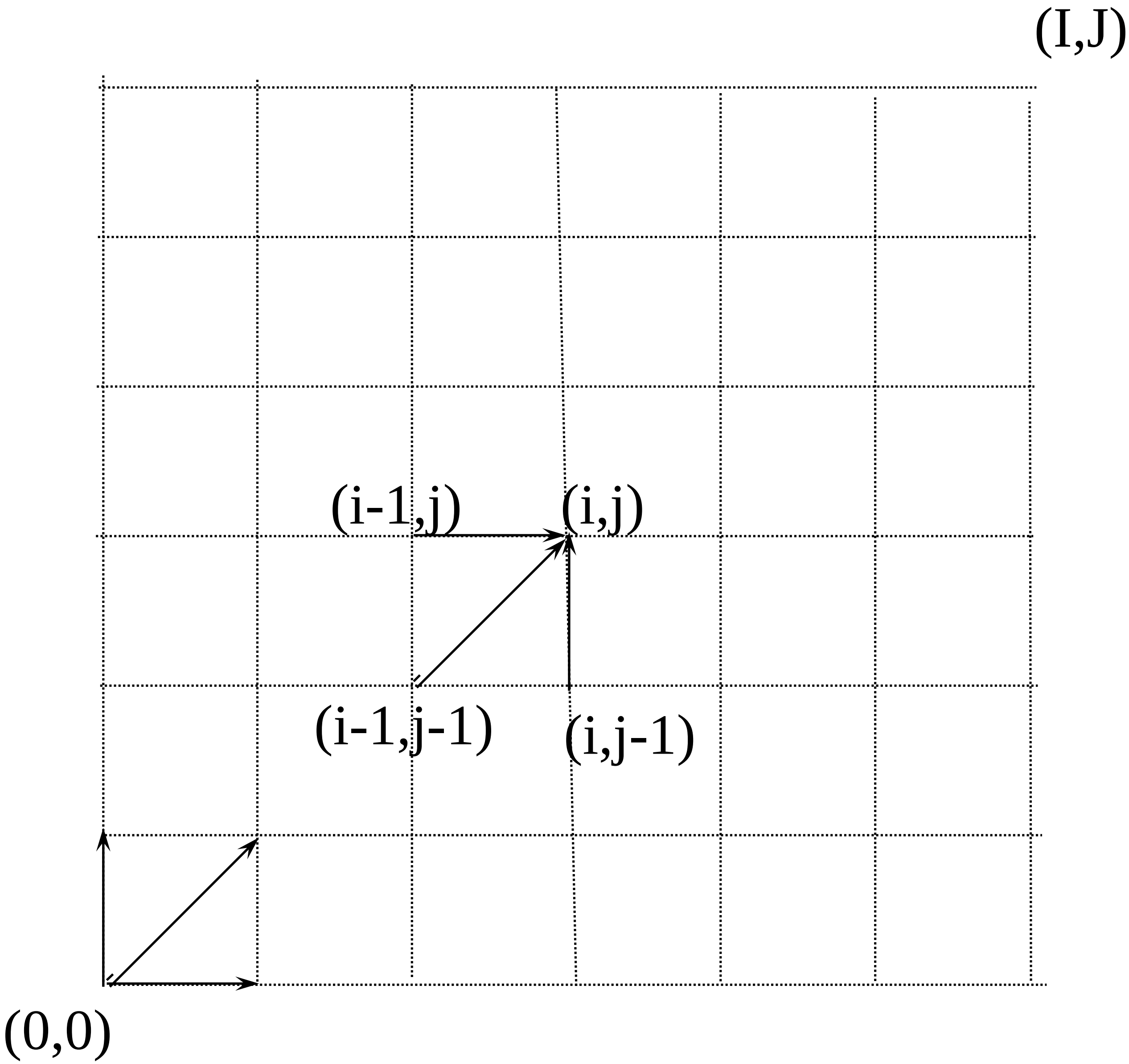
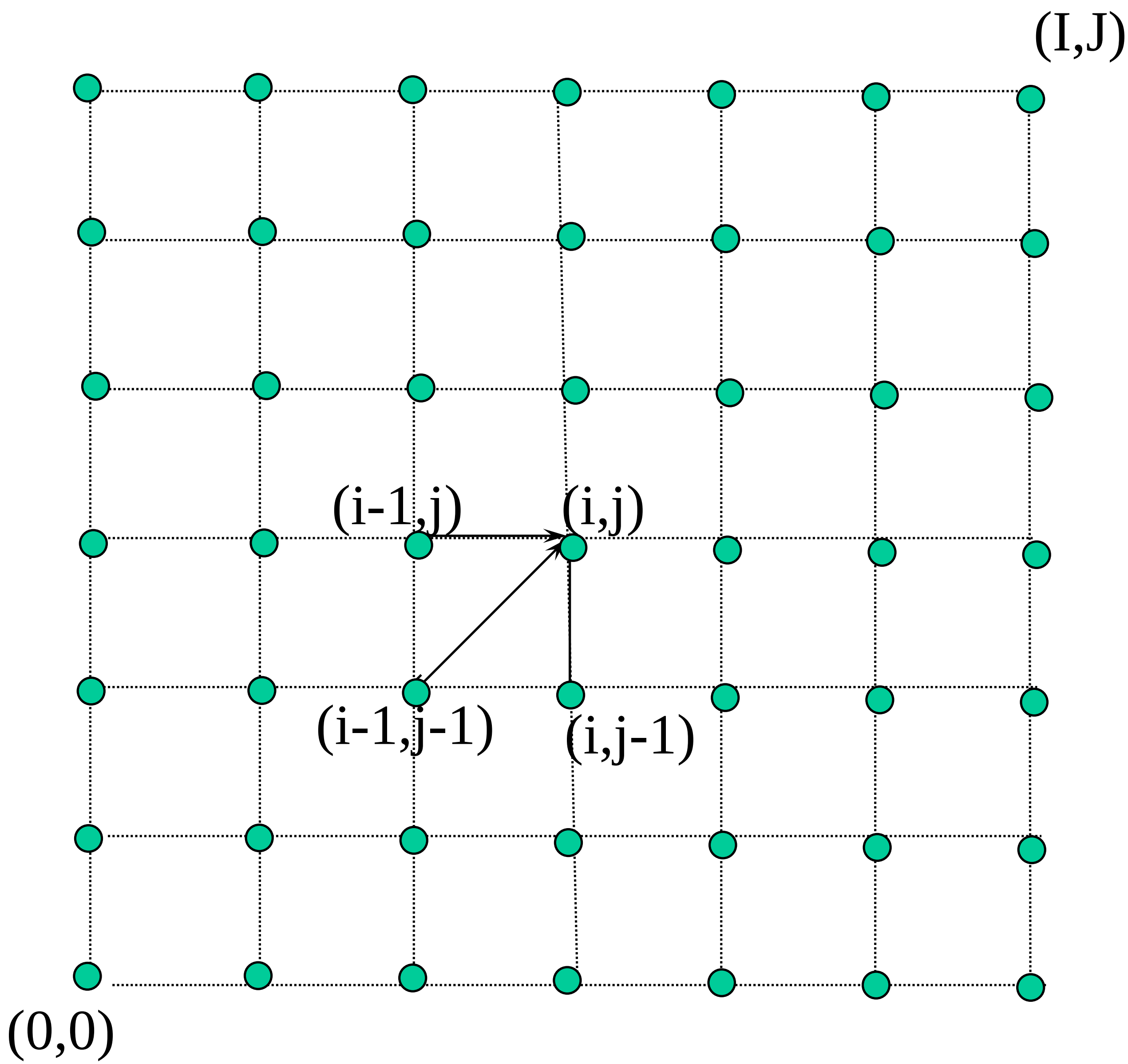
Problema: Encontrar el camino más corto entre (0,0) y (I,J)

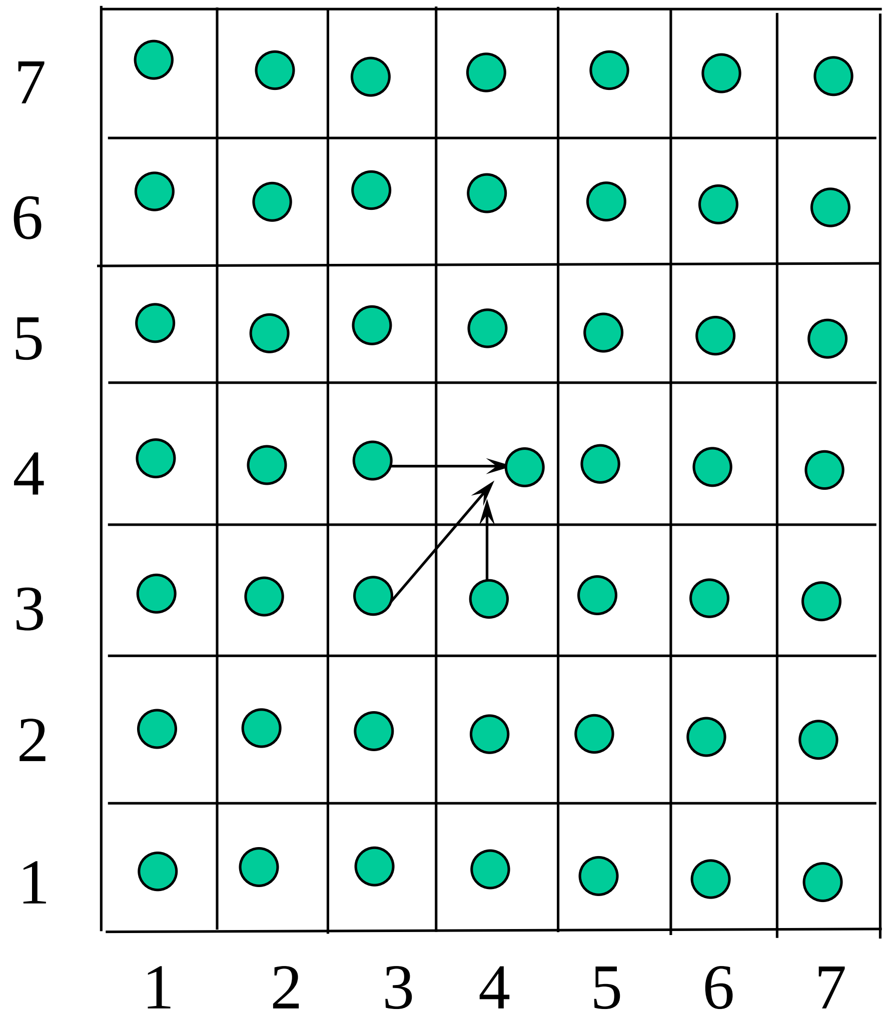


$$
coste(i,j)=\begin{cases} 0 & (i=1)\wedge(j=1) \\ coste(i,j-1)+d[(i,j),(i,j-1)] & (i=1)\wedge(j>1) \\ coste(i-1,j)+d[(i,j),(i-1,j)] & (i>1)\wedge(j=1) \\ \min\left\{\begin{array}{l} coste(i,j-1)+d[(i,j),(i,j-1)], \\ coste(i-1,j)+d[(i,j),(i-1,j)], \\ coste(i-1,j-1)+d[(i,j),(i-1,j-1) \end{array}\right\} & (i>1)\wedge(j>1) \end{cases}
$$

Solución: coste(I,J)


(I,J)
(i-1,j)
(i,j)
(i-1,j-1)
(i,j-1)
(0,0)

T: matriz[1..I,1..J] de **R**;



Función coste (I,J:**N**):**R**;
var T: matriz[1..I,1..J] de **R**;

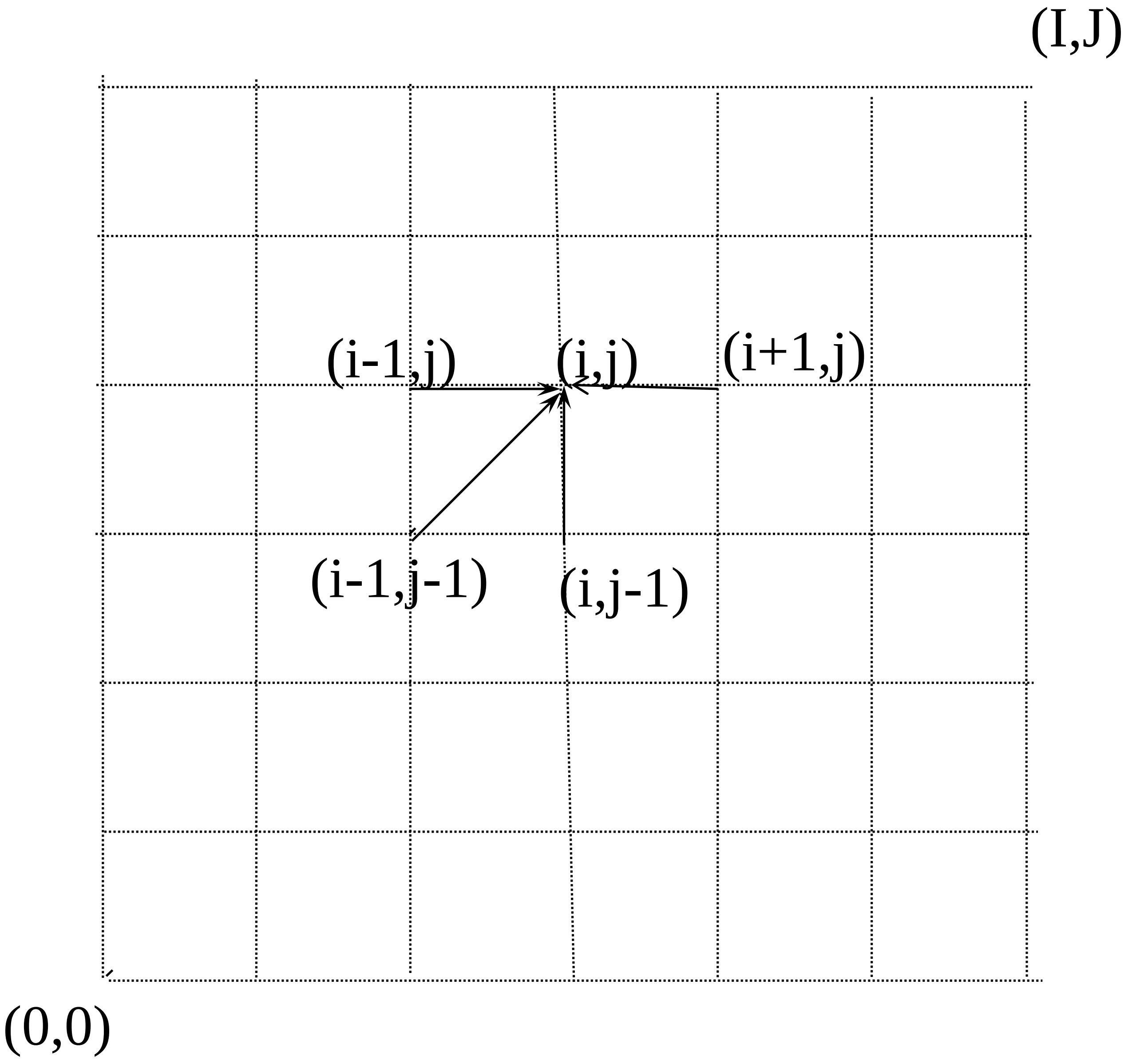
T[1,1]=0
para j=2 **hasta** J **hacer** T[1,j]=T[1,j-1]+d[(1,j),(1,j-1)] **fpara**
para i=2 **hasta** I **hacer**
    T[i,1]=T[i-1,1]+d[(i,1),(i-1,1)]
    para j=2 **hasta** J **hacer**

$$T[i,j] = \min\left\{\begin{matrix} T[i-1,j] + d[(i,j),(i-1,j)], \\ T[i,j-1] + d[(i,j),(i,j-1)], \\ T[i-1,j-1] + d[(i,j),(i-1,j-1)] \end{matrix}\right\}$$

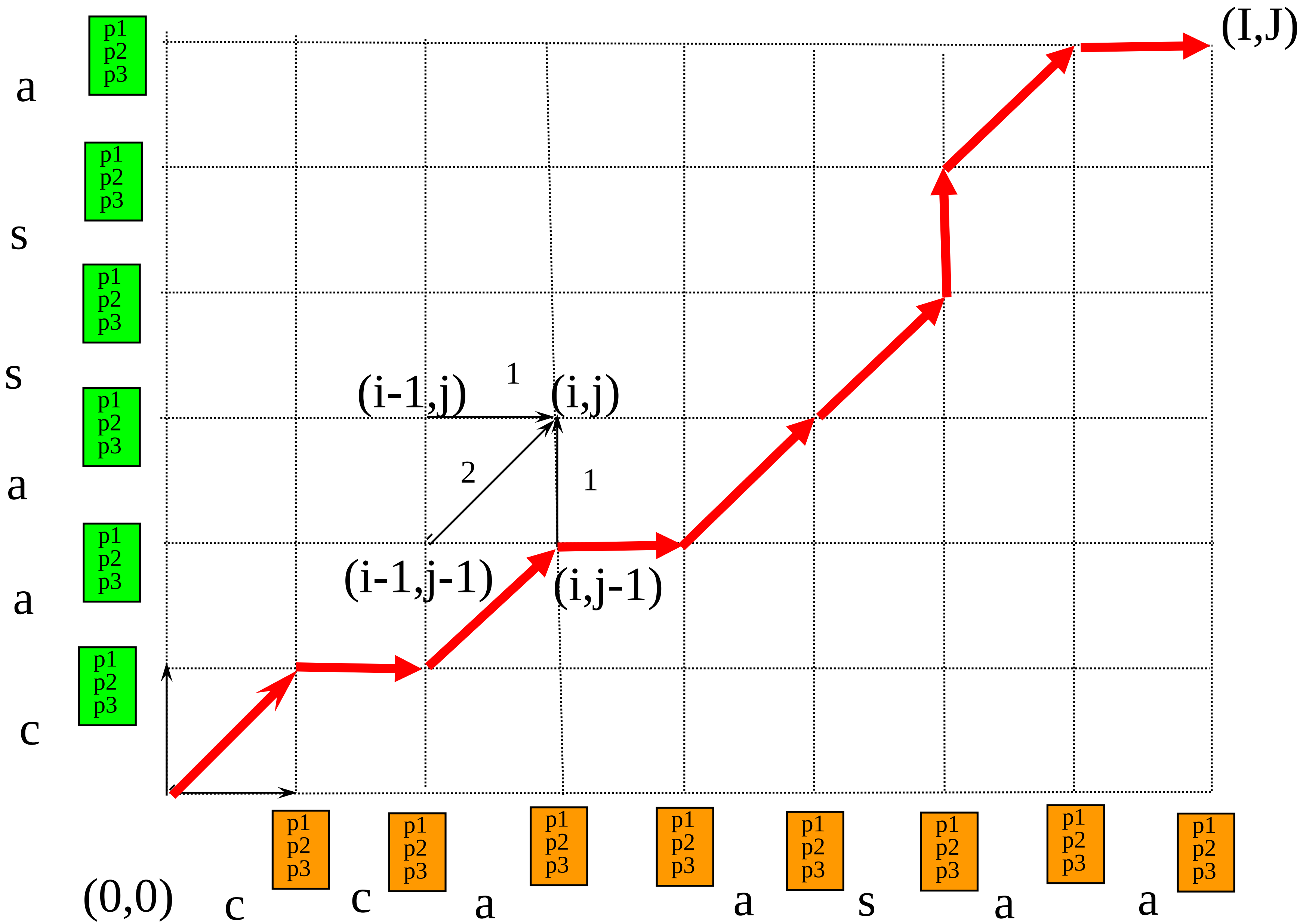
    fpara
fpara
coste=T[I,J];
fin

Coste O(IJ)

¿Qué ocurriría si añadimos un nuevo movimiento?



Problema: Alineamiento temporal



Problema: Encontrar el camino más corto entre cualquier punto (i,0) y cualquier punto (i,J)

(I,J)

(0,0)

$$
\mathrm{coste}(i,j)=\begin{cases}0 & (j=0)\\ \infty & (i<0)\vee(i>I)\\ \min\left\{\begin{array}{l}\mathrm{coste}(i,j-1)+d[(i,j),(i,j-1)],\\ \mathrm{coste}(i-1,j)+d[(i,j),(i-1,j)],\\ \mathrm{coste}(i-1,j-1)+d[(i,j),(i-1,j-1)\\ \mathrm{coste}(i+1,j)+d[(i,j),(i+1,j)]\end{array}\right\} & (j>0)\end{cases}
$$

Solución: $\max\limits_{\forall i}$ {coste(i,J)}

Función coste (I,J:**N**):**R**;
var T: matriz[-1..I+1,0..J] de **R**;

para i=0 **hasta** I **hacer** T[i,0]=0 **fpara**

para j=0 **hasta** J **hacer** T[-1,j]=∞; T[I+1,j]=∞ **fpara**

para j=1 **hasta** J **hacer**

  para i=I **hasta** 0 **hacer**

$$T[i,j] = \min\left\{\begin{array}{l} T[i-1,j] + d[(i,j),(i-1,j)], \\ T[i,j-1] + d[(i,j),(i,j-1)], \\ T[i+1,j] + d[(i,j),(i+1,j)] \\ T[i-1,j-1] + d[(i,j),(i-1,j-1)] \end{array}\right\}$$

  fpara

fpara

coste= $\max\limits_{\forall i}$ T[i,J];

fin