$$c[x,y] = \min_{i<k\le j}\{c(x,k-1)+c(k,y)\} + w(x,y)$$

$$w(x,y) = w(x,y-1) + p(y) + q(y).$$

$r(x,y) = k$

$n = 4$, $a_1, a_2, a_3, a_4 = (do, if, int, while)$

$p_i = 3, 3, 1, 1$

$q_i = 2, 3, 1, 1, 1$

$j - i = 0$

$c(0,0), c(1,1), c(2,2), c(3,3), c(4,4)$

Too

when $j-i = 0$, initial formula.

$c(i,j) = 0$

$r(i,j) = 0$

$w(i,j) = q(i)$.

$c(0,0) = 0$

$r(0,0) = 0$

$w(0,0) = q(0) = 2$.

p_1 -3 p_2 -3 p_3 -1 p_4 -1

q_0 -2 q_1 -3 q_2 -1 q_3 -1 q_4 -1

Till

$j - i = 1$

$T_{01}, T_{12}, T_{23}, T_{34}$

$c(1,1)$

$r(1,1)$

$w(1,1) = w(1,0) + p(y) + q(1)$.

T_{01}

$c(0,1) = \min\{c(0,0) + c(1,1)\} + w(0,1) = 0+8 = 8$

$r(0,1) = 1$

$w(0,1) = w(0,0) + p(1) + q(1) = 2+3+3 = 8$

T_{02}

$w(0,2) = w(0,1) + p(2) + q(2)$

$= 8 + 3 + 1 = 12$.

0 1 2 3 4

c(0,0) 0 w(0,0) 2 r(0,0) 0	c(1,1) 0 w(1,1) 3 r(1,1) 0	c(2,2) 0 w(2,2) 1 r(2,2) 0	c(3,3) 0 w(3,3) 1 r(3,3) 0	c(4,4) 0 w(4,4) 1 r(4,4) 0
c(0,1) 8 w(0,1) 8 r(0,1) 1	c(1,2) 7 w(1,2) 7 r(1,2) 2	c(2,3) 3 w(2,3) 3 r(2,3) 3	c(3,4) 3 w(3,4) 3 r(3,4) 4	
c(0,2) 19 w(0,2) 12 r(0,2) 1	c(1,3) 12 w(1,3) 9 r(1,3) 2	c(2,4) 8 w(1,3) =5 r(1,3) =3		
c(0,3) 25 w(0,3) 14 r(0,3) 2	c(1,4) 19 w(1,4) 11 r(1,4) 2			
c(0,4) 32 w(0,4) 16 r(0,4) 2				

T12

$r(1,2) = 2$

$w(1,2) = w(1,1) + p(2) + q(2) = 3 + 3 + 1 = 7$

$c = \min\{c(1,1) + c(2,2)\} + w(1,2)$

$= 0 + 7$

T23

$r(2,3) = 3$

$w(2,3) = w(2,2) + p(3) + q(3)$

$= 1 + 1 + 1 = 3$

$c(2,3) = \min\{c(2,2) + c(3,3)\} + w(2,3)$

$= 0 + 3 = 3$

T34

$r(3,4)$

$w(3,4) = w(3,3) + p(4) + q(4) = 1 + 1 + 1 = 3$

$c(3,4) = c(3,3) + c(4,4) + w(3,4) = 3$

T_{02}

$r(0,2) = 1$.

$w(0,2) = w(0,1) + p(2) + q(2) = 8 + 3 + 1 = 12$

$c(0,2) = \min \begin{Bmatrix} c(0,0) + c(1,2), \\ c(0,1) + c(2,2). \end{Bmatrix} + w(0,2)$

$= \min \begin{Bmatrix} 0 + 7, \\ 8 + 0 \end{Bmatrix} + 12$

$= \underline{19}$

T_{13}

$r(1,3) = 2$

$w(1,3) = w(1,2) + p(3) + q(3) = 7 + 1 + 1 = 9$.

$c(1,3) = \min \begin{Bmatrix} c(1,1) + c(2,3), \\ c(1,2) + c(3,3) \end{Bmatrix} + w(1,3)$.

$= \min \begin{Bmatrix} 0 + 3, \\ 7 + 0 \end{Bmatrix} + 9$

$= 3 + 9 = 12$.

T_{24}

$r(2,4) = 3$

$w(2,4) = w(2,3) + p(4) + q(4) = 3 + 1 + 1 = 5$.

$c(2,4) = \min \begin{Bmatrix} c(2,2) + c(3,4), \\ c(2,3) + c(4,4) \end{Bmatrix} + w(2,4)$

$= \min \begin{Bmatrix} 0 + 3, \\ 3 + 0 \end{Bmatrix} + 5$.

$= 8$

$j - i = 3$

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T_{03}

$r(0,3) = 2$

$w(0,3) = w(0,2) + p(3) + q(3) = 12 + 1 + 1 = 14$

$c = \min \left\{ \begin{matrix} c(0,0) + c(1,3), \\ c(0,1) + c(2,3), \\ c(0,2) + c(3,3) \end{matrix} \right\} + w(0,3)$.

$= \left\{ \begin{matrix} 0 + 12, \\ 8 + 3, \\ 19 + 0 \end{matrix} \right\} + 14$

$= \left\{ \begin{matrix} 12, \\ (11) \\ 19 \end{matrix} \right\} + 14 = 25$

T_{14}

$r(1,4) = 2$

$w(1,4) = w(1,3) + p(4) + q(4) = 9 + 1 + 1 = 11$

$c(1,4) = \min \left\{ \begin{matrix} c(1,1) + c(2,4) \\ c(1,2) + c(3,4) \\ c(1,3) + c(4,4) \end{matrix} \right\} + w(1,4)$

$= \min \left\{ \begin{matrix} 0 + 8, \\ 7 + 3, \\ 12 + 0 \end{matrix} \right\} + 11$

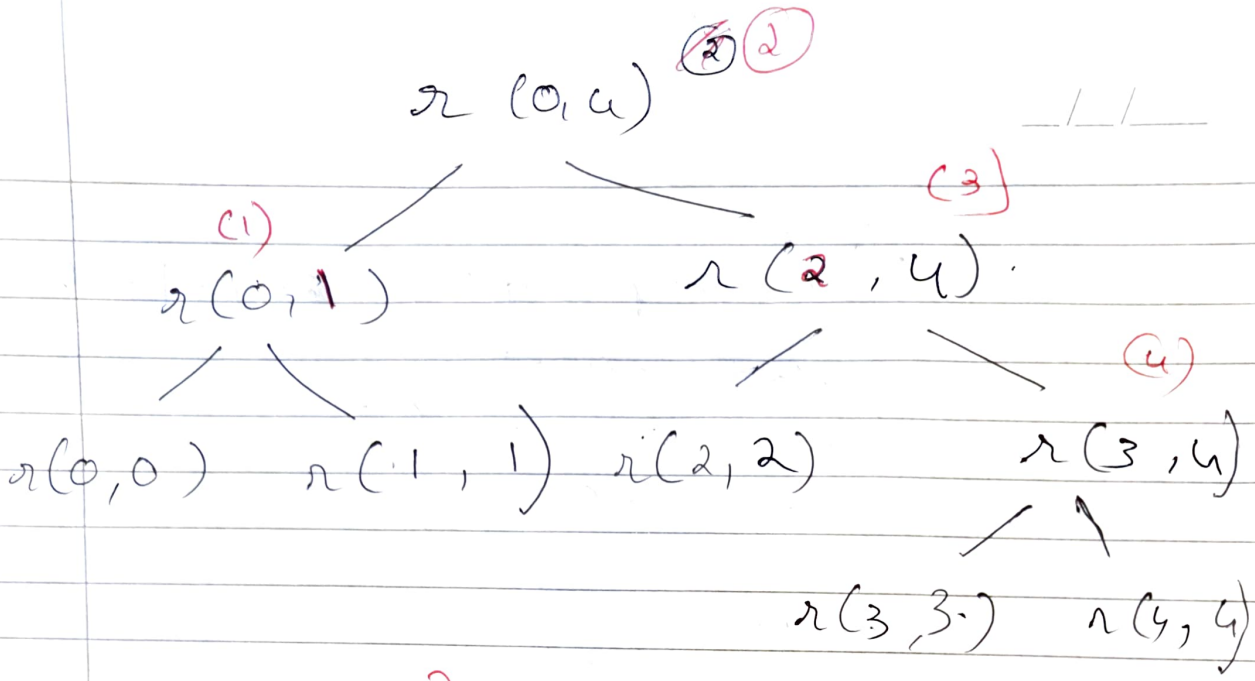
$= \min \left\{ \begin{matrix} (8), \\ 10, \\ 12 \end{matrix} \right\} + 11 = 19$.

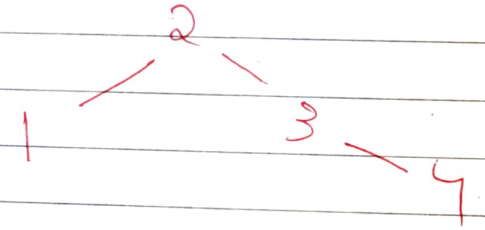
T_{04}.

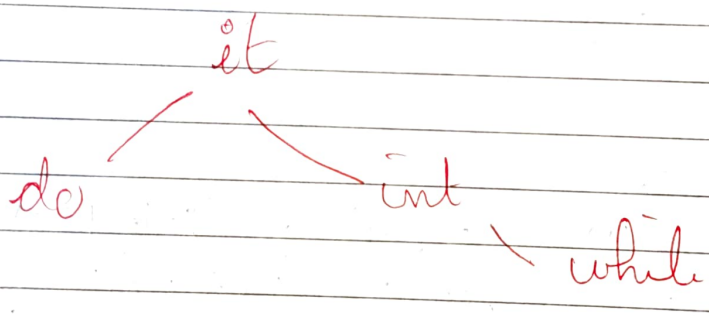
$r(0,4) = 2$

$w(0,4) = w(0,3) + p(4) + q(4) = 14 + 1 + 1 = 16$.

$c(0,4) = \min \left\{ \begin{matrix} c(0,0) + c(1,4) \\ c(0,1) + c(2,4) \\ c(0,2) + c(3,4) \\ c(0,3) + c(4,4) \end{matrix} \right\} + 16 = \left\{ \begin{matrix} 0 + 19, \\ 8 + 8 \\ 19 + 3 \\ 25 + 0 \end{matrix} \right\} + 16 = \left\{ \begin{matrix} 19 \\ (16) \\ 22 \\ 25 \end{matrix} \right\} + 16 = 32$


r(0,4)
(2)
(1)
r(0,1)
(3)
r(2,4)
(4)
r(0,0)
r(1,1)
r(2,2)
r(3,4)
r(3,3)
r(4,4)


2
1
3
4


it
do
int
while