9631407- علی نوری‌نژاد

تمرین سری سوم

1

i \ j	1	2	3	4	5
1	35 (1)	75 (1)	154 (2)	189 (3)	262 (3)
2		25 (2)	82 (3)	114 (3)	187 (3)
3			37 (3)	69 (3)	142 (3)
4				17 (4)	62 (5)
5					38 (5)

$$w[i,j] = \begin{cases} q_{i-1} & i = j+1 \\ w[i,j-1] + P_j + q_j & i \neq j+1 \end{cases}$$

$$c[i,j] = \begin{cases} w[i,j] & i = j \\ \min\limits_{i<k\leq j} \{c[i,k-1] + c[k+1,j] + w[i,j] & i \neq j \end{cases}$$

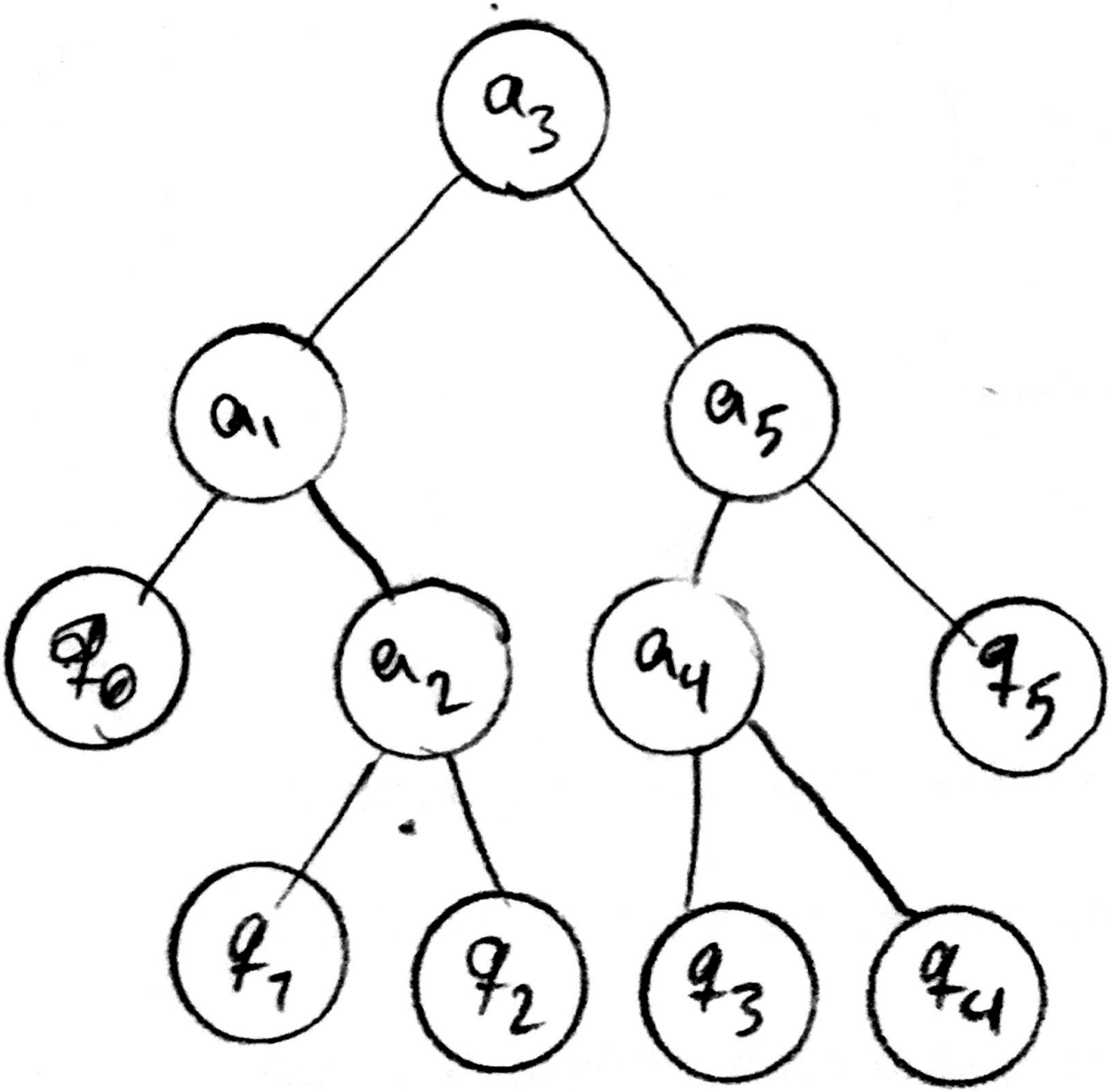
$c[1,2] = \min\{\underline{75}, 85\}$ $\quad c[2,3] = \min\{94, \underline{82}\}$ $\quad c[3,4] = \min\{\underline{69}, 89\}$

$c[4,5] = \min\{83, \underline{62}\}$

$c[1,3] = \min\{164, \underline{154}, 157\}$ $\quad c[2,4] = \min\{141, \underline{114}, 154\}$ $\quad c[3,5] = \min\{\underline{142}, 152, 149\}$

$c[1,4] = \min\{211, 201, \underline{187}, 251\}$ $\quad c[2,5] = \min\{242, \underline{187}, 220, 214\}$

$c[1,5] = \min\{312, 302, \underline{262}, 317, 314\}$


a_3
a_1
a_5
q_0
a_2
a_4
q_5
q_1
q_2
q_3
q_4

```
TWO_ARRAY_MEDIAN(X, Y)
    n = X.length
    median = FIND_MEDIAN(X,Y,n,1,n)
    if median == NOT_FOUND
        median = FIND_MEDIAN(Y,X,n,1,n)
    return median
```

```
FIND_MEDIAN(A,B,n,low,high)
 if low < high   return NOT_FOUND
 else k = ⌊(low+high)/2⌋
    if k==n and A[n] ≤ B[1]   return A[n]
    elseif k<n and
        B[n-k] ≤ A[k] ≤ B[n-k-1].
            return A[k]
    elseif A[k] ≥ B[n-k+1]
        return FIND_MEDIAN(A,B,n, low, k-1)
    else return FIND_MEDIAN(A,B,n, k+1, high)
```

(2)

از آنجا که از BST استفاده می‌کنیم، الگوریتم $O(\lg n)$ خواهد بود.