

#### Q4

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Answer:

Let us say the  $P(K, j, i)$  will be the maximum weight path,  $K$  is the length of the path from vertex  $j$  to vertex  $i$ . We can simply solve the following subproblem:

What is the maximum weight path of length exactly  $k$  where  $1 \leq k \leq K$  which ends at  $i$ .

$Sp(k, j, i)$  is the set of paths start from any vertex  $j$  to  $i$ .

The base case is:

$$P(1, j, i) = \text{MAX}\{w(j, i)\} \text{ (} w \text{ stands for weight)}$$

Hence, we solve the recursion:

$$P(k, j, i) = \text{MAX}\{Sp(k-1, j, i) + \text{MAX}\{Sp(1, n, j)\}\}$$