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Question5:

Suppose $\text{weight}(i,j)$ as the path weight between i and j , i and j must be interconnect.

Let $\text{Max_total}(i,j,L)$ be the largest weight from i to j using exactly L steps
 i,j could be any point in G and i could equals to j , $0 \leq L \leq k$

Base case:

$\text{weight}(i,i) = 0$

$\text{Max_total}(i,i,0) = 0$

$\text{Max_total}(i,j,1) = \text{weight}(i,j)$, i and j must be interconnect

Recursively,

$\text{Max_total}(i,j,L)$ can be represent as

$$\text{Max}(\text{Max_total}(i,J,L-1) + \text{weight}(J,j) \quad \text{for all } J \text{ that linked to } j)$$

The maximum total weight from point i to point j in exactly k steps will be

$\text{Max_total}(i,j,k)$

This will takes $O(V^3k)$