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**Question 4**

According to the question, we can apply dynamic programming to divide this problem into n sub-problems and find the optimal solution for all sub-problems. Recursively solve each sub-problem. Assume  that meaning when the fixed vertex is, the length happens to be the maximum weight of k. We need to traverse every vertex in the graph G(V,E). the vertex represent that the path end at . Find all vertices that can go to and record as . represent that the weight value of vertex to . Then perform recursive calculations according to the following formula:

It is obvious that base case is

When the length = 1:

When the length = K:

We need to record the maximum weight information obtained by each vertex in an array.

**Max weight =**

Finally, we can get the path in G of length exactly K that has maximum total weight.