## Question 4

An arbitrary point belong to graph . is the **optimal solution** for with the length . That is, the maximum weight path of length which ends at . Obviously, because this path does not go through any edge in .

In general, for every vertex in , we need to find where is the required length in this question and then the maximum total weight would be:

First, go through graph and record the adjacent vertex (the vertex that can reach ) for any vertex . The adjacent vertex for any vertex could be in set .

For obtaining the , we can follow the method of dynamic programming.

* Known that the Base case .
* where is the weight of edge and this edge has vertex on its end.
* Therefore, we can recursively solve this equation until and = 0
* During the recursion, for every optimal solution for the subproblem, we record its path information to an array or a linked list structure.

Overall, we obtain the optimal solution (path that maximum the weight) for every vertex in by applying the dynamic programming. Choosing the vertex with the maximum and then check our linked list structure to obtain the target path.