# Question4

## Set up

G = (V,E)

There are n vertexes

is node,

k is length,

## Subproblem:

The subproblem is the maximum amount of the total weight when it travels k length.

be the maximum number of the sum of maximum weight when it travels k length.

is the weight of the edge form vertex j to i;

**j node represents all possible value that can connect from j to i (**

## Recursion

(for example:

if , there are vertex 2,3,5 can connect to vertex 1, the recursion would be

)

Define a function to find the path (which vertex has been visited):

This function returns the vertex that produce the maximum weight.

(Like above example, if 3 can make the total maximum weight, this function returns 3)

## Base case

**Let base case**

## Final solution

if find the maximum optimal solution, using defined function to get the path for the solution.

## Time Complexity

Runs in

## Example Case

There is a directed weighted graph.

In this case, let K = 3

2

6

5

2

7

4

3

1

There are 5 vertexes.

Using opt() function to find every vertex’s maximum solution.

Vertex 1:

Using recursion function:

Therefore

So,

Do the same on

Then, the maximum of them is the solution.

In this case, opt(3,3) and opt(4,3) are the solution which are 15.

By using function, we can find the path.

For 1->2->5->3

For 2->5->3->4