**Problem Proposal Submission –MC111**

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**1)Problem Statement** :

How to find the shortest possible path between any two given points on a graph (means it can be any two locations in real life) using an algorithm?

**2)Objective** :

To study the algorithm which can find the shortest possible path between any two nodes in a graph i.e. Dijkstra’s path finding algorithm.

**3)Motivation behind studying this algorithm:**

It was fascinating for me to know that Google maps that we use in everyday life for finding the shortest distance between any two locations uses Dijkstra’s algorithm,so it motivated me to know and study this problem.

**4) Methodolgy and Work Plan:**

We can understand this algorithm by considering a graph consisting of nodes and edges .We can firstly choose a starting node (source node) and then using this algorithm find the node which is adjacent and also which is at the shortest distance from source node .We will make use of weighted edges (edge that contains any information like distance between the two nodes which is joined by that edge) for joining nodes in the graph. Then we will include that point in our path and mark it as a visited point. Now, we will only look for nodes which are adjacent to our path and then we will follow the same algorithm and mark the visited points and include them in our path. We will stop when all the nodes in our graph are marked as visited. And by this we have found the shortest path to go to any node on graph from the source node! .I will try to describe complete idea in detailed report.

In real life situations also, we can apply this algorithm to find the most shortest path and figure out the optimal and most economic path for our travel. All we have to do is to assume the starting point, the destination and all the particular locations coming in between as nodes. The roads joining these locations can be taken to be as edges in the graph. And note down the distances between these scattered locations so we can write that on the concerned edges(as they are weighted edges). And then use Dijkstra’s path finding algorithm.