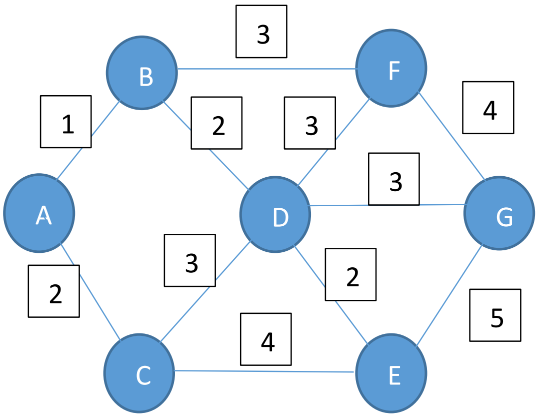
Dijkstra

What is Dijkstra ?

Dijkstra is an algorithm that takes a graph with nodes and distances between them and returns the shortest path between the nodes we want in terms of the distances given.

How does it work ?

Let's take this graph for example :



Let's find out the shortest path from A to G. To do this, it is better to see it from a table.

A	B	C	D	E	F	G	Steps
0	1 A	2 A					1
X	1 A		3 B		4 B		2
X	X	2 A	5 C	6 C			3
X	X	X	3 B	5 D	6 D	6 D	4
X	X	X	X		4 B	8 F	5
X	X	X	X	5 D	X	10 E	6
X	X	X	X	X	X	6 D	7

Number of steps according to the number of nodes.

We begin from A so our first step is to put a 0 on the A of the first step and put X to the other steps because we will not go back to the node X. We put the then the cost that it takes to go to the adjacents nodes and the node we are coming from. To go to the second step, we compare our costs and we put in red the one that costs the less. When we put the 1A, we cross the rest of the column with Xs and we eliminate it from the possibles choices for the future. We put then the edges possible from B which are F and D and we add the costs. We see each edge between 2 A, 3 B and 4 B costs less, which is 2 A and then we put it in red in the next step. We do these steps for each step to have at the end our final result which is 6 D.

Once we obtain our final results by comparing all the nodes in our destination’s column (6 D, 8 F and 10 E), we have to rebuild our path.

We do that by seeing the red node from the initial line of 6 D, here 3 B. We do the same for 3 B we see that it came initially from 1 A.

We have our path which is A→B→D→G which costs 6.

What about the project ?

Now that we know how it works, we are going to build our go project based on this method.