

The implementation of the Bellman Ford Algorithm using two functions, function Bellman_Ford that implements the algorithm itself and function path that prints the lowest cost path between the two vertices.

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# Implementation of the Bellman Ford Algorithm
def Bellman_Ford(self, start, end):
    # Initializing the distance and parent lists
    distance = [float("Inf")] * self.vertices
    distance[start] = 0 # The start vertex has the distance 0
    parent = [-1] * self.vertices

    changed = True

    # While there are still changes made to the distances
    for i in range(1, self.vertices):
        changed = False
        # We go through all the edges and check whether we can improve the
cost of the path
        # from a vertex to another using the edge between them
        for key in self.dict_cost:
            if distance[key[0]] != float("Inf") and distance[key[0]] +
self.dict_cost[key] < distance[key[1]]:
                # We modify the distance of the second vertex, change its
parent to the first vertex
                distance[key[1]] = distance[key[0]] + self.dict_cost[key]
                parent[key[1]] = key[0]
                # We are still making changes
                changed = True
        if not changed:
            break

    # Second Traversal for Identifying whether or not we have negative
cycles
    for key in self.dict_cost:
        if distance[key[0]] != float("Inf") and distance[key[0]] +
self.dict_cost[key] < distance[key[1]]:
            return 0
    # If we did not find a path to the edn vertex
    if distance[end] == float("Inf"):
        return -1
    # Print the path from the start vertex to the evd vertex
    self.path(parent, distance, end)
    # Return the cost of the path
    return distance[end]
```