

Analysis of the Algorithm for Xplore Rwanda

Function	Description	Parameter	Time complexity	Space complexity
pointreproject()	enables us to project the actual location of our source and destination points.	Latitude, Longitude, Input ref sys, Output ref sys	$O(1)$	$O(N)$
rgraphfrompoints()	plot out the graph of our converted coordinate system	Origin, Destination	$O(V + E)$ V: vertex E: edge	$O(N)$ N: no of nodes
pointreproject2edge()	To Find the nearest network's edge for the given point, and reprojects it perpendicularly to its nearest edge.	Point, Roadgraph	$O(N)$ N: distance from nearest coordinates	$O(N)$ N: no of nodes
nearest_edge_node_id ()	find the nearest network's node id for the given point	Point, Roadgraph	$O(N^2)$ N: distance from nearest coordinates	$O(N)$ N: no of nodes
routeplot()	To find and plot the shortest route based on Dijkstra's pathfinding algorithm	Origin, Destination	$O(N^2)$ N: number of nodes	$O(N^2)$ N: number of nodes

Overall:

Time complexity = $O(N^2)$

Space complexity = $O(N^2)$

Where N = number of nodes