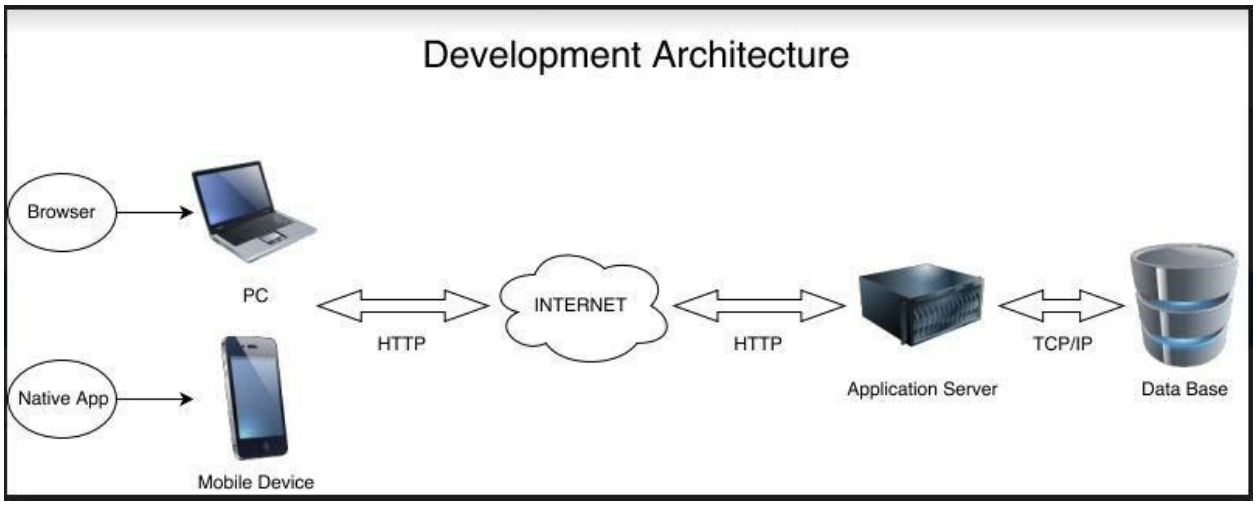
System Implementation

1.



1.12 Software Algorithm

< In this section, you need to include all the implemented data structures with their control flow diagrams.>

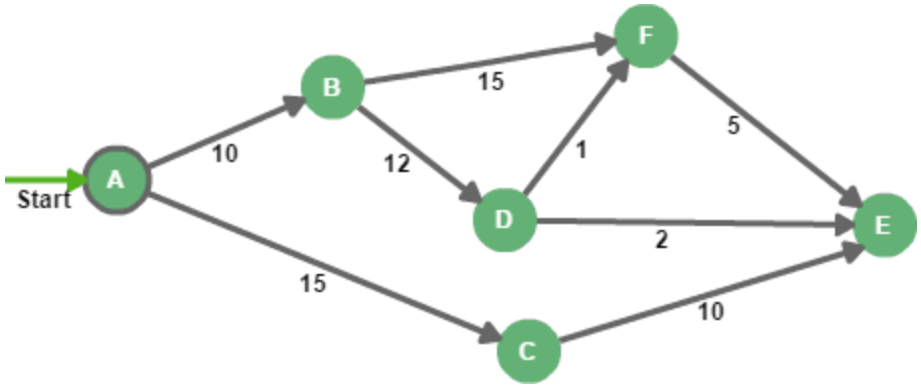
1.17.1 **Calculate distance between two GPS coordinate**
This algorithm calculate the distance between two coordinates and return the distance in meters

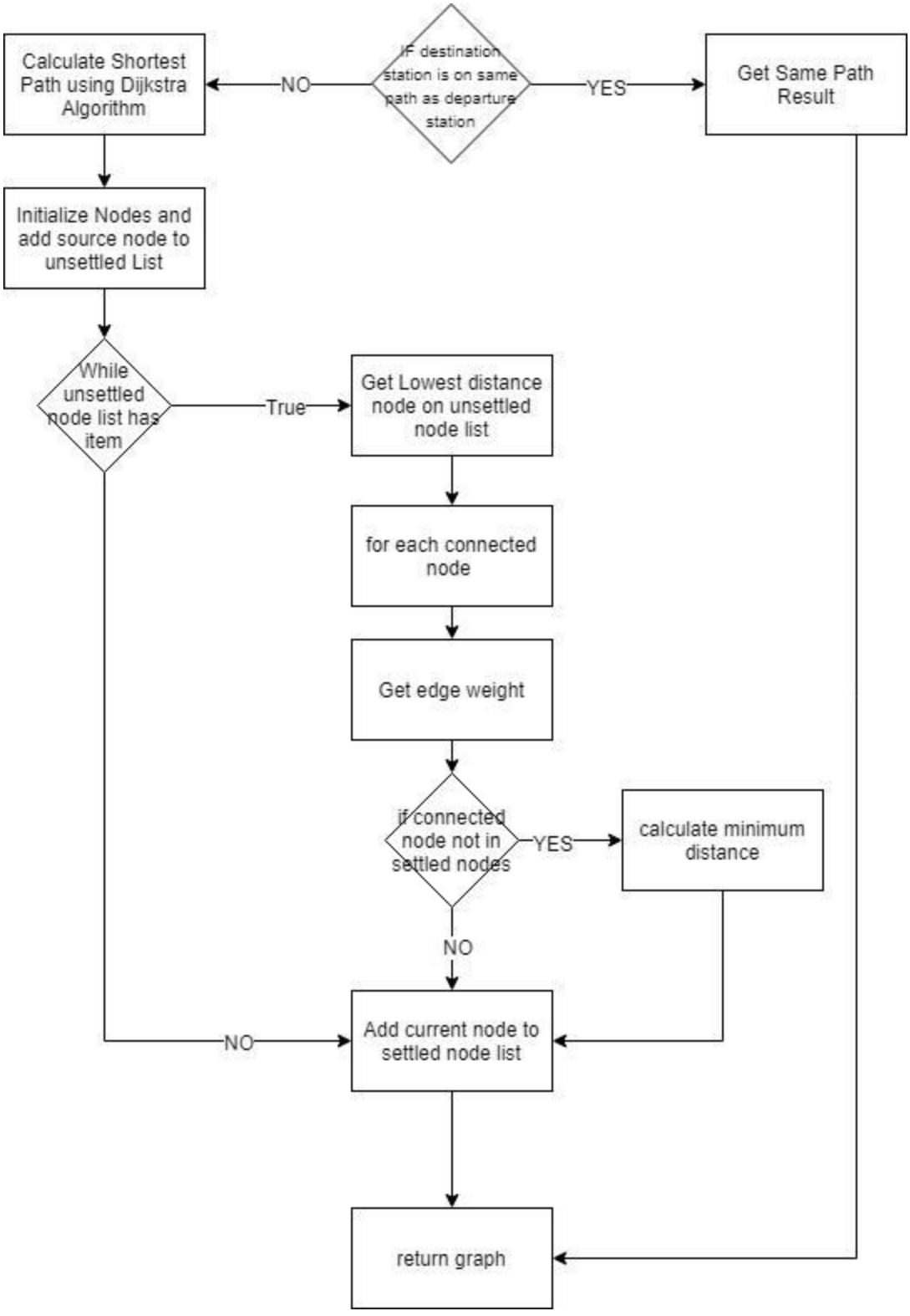
step 1 : calculate latitude and longitude distance
LatDistance = Convert From degree to radians (lat1 - lat2)
LonDistance = Convert From degree to radians (lon1 - lon2)
step 2 : calculate the distance
distance = sin (LatDistance / 2) * sin (LatDistance / 2) + cos (Convert to radians(lat1) * cos (Convert to radians (lat2)) + sin (LonDistance / 2) * sin (LonDistance / 2)
step 3 : distance = 2 * tan (square distance, square 1 - a))
step 4: convert result to meters
Radius of earth * distance * 1000

1.17.2 **Find the nearest Station**

step 1 : Get user GPS location.
step 2 : Fill Station List with their distance from user location.
step 3 : Sort station list on distance.
step 4 : Return first station in the list.

1.17.3 **Calculate shortest path between two station**


Start
A
B
C
D
E
F
10
15
12
15
1
5
2
10


IF destination station is on same path as departure station
NO
YES
Calculate Shortest Path using Dijkstra Algorithm
Get Same Path Result
Initialize Nodes and add source node to unsettled List
While unsettled node list has item
True
Get Lowest distance node on unsettled node list
for each connected node
Get edge weight
if connected node not in settled nodes
YES
calculate minimum distance
NO
NO
Add current node to settled node list
return graph