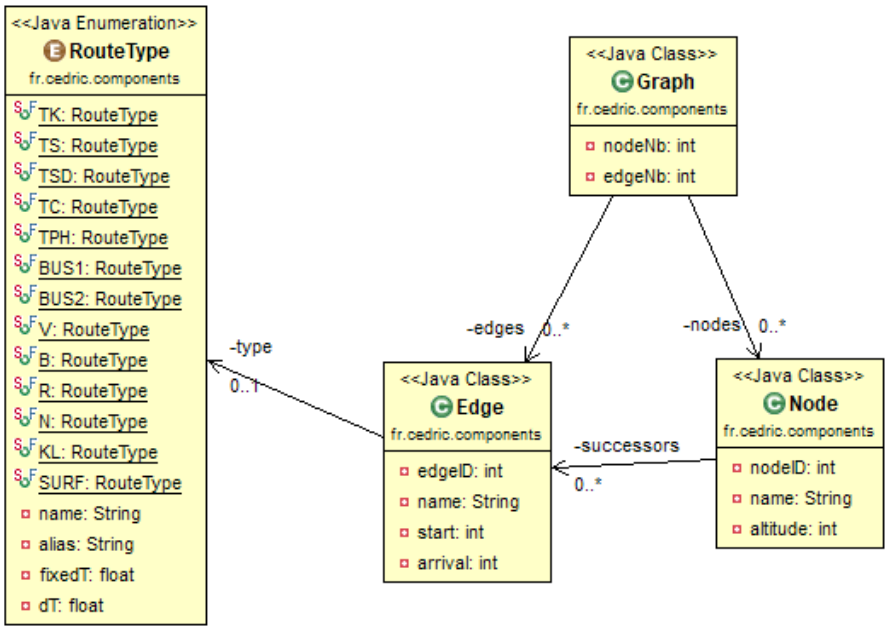
AG44 – Project 2 – Ski resort

Cédric PAQUET – Groupe A

1) The graph-theory problem of Mr Touchousse is the « Shortest Path problem » in an oriented graph. I decided to implement the Dijkstra algorithm because there is no road with a negative weight value, otherwise we would have to use the Bellman-Ford algorithm.
2) To deal with this problem, we draw a new graph with only the routes that the skier can use and then to know which points he can access we parse the graph with a DFS or BFS and mark all the nodes we visited as « Reachable » and color them in green.

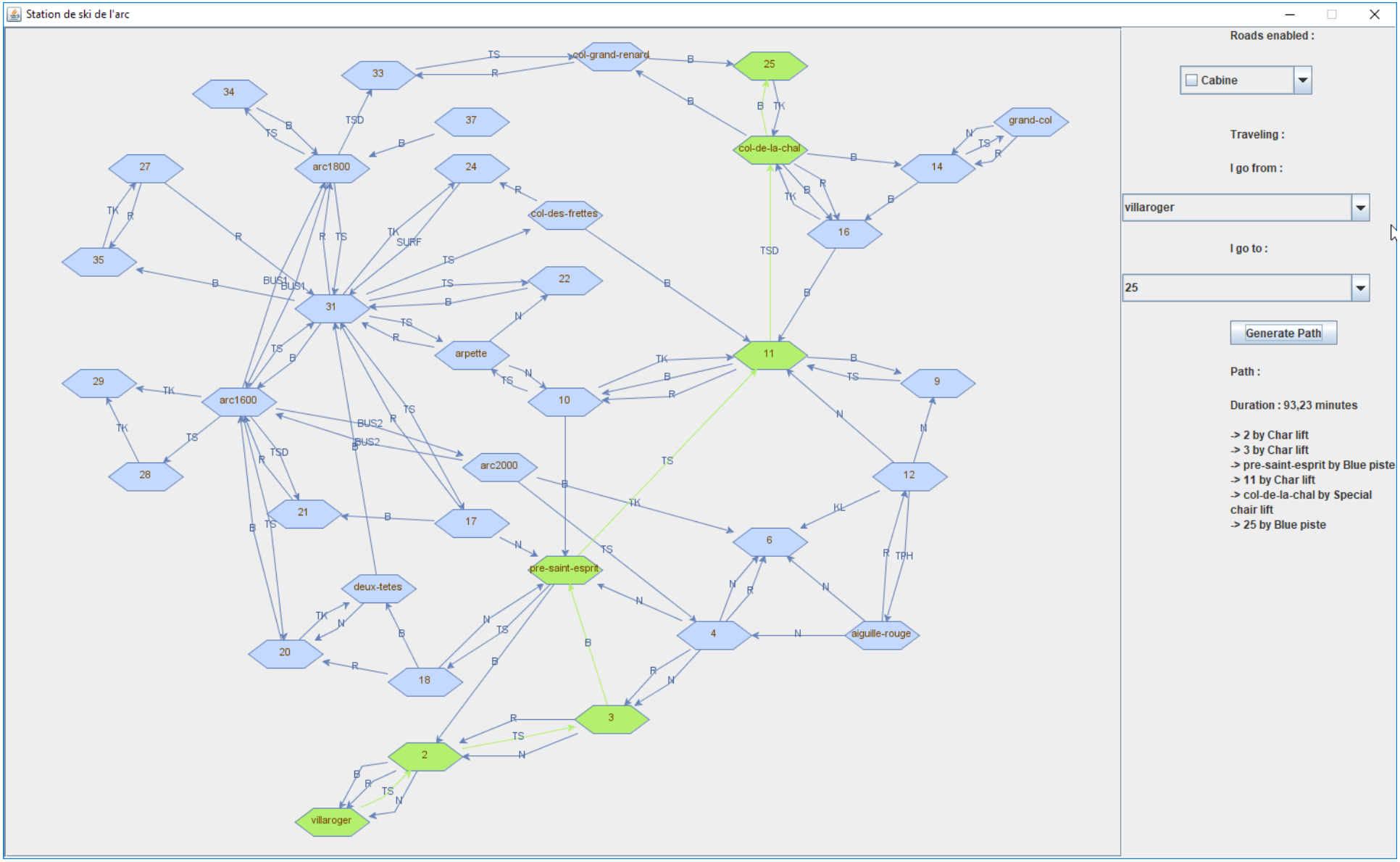
Data structures :



I drew the Class diagram to make the architecture of the code easier to understand.

Some precions about the computation of distances between Nodes :

First we compute the difference of altitude between the 2 nodes. Then, depending on the type of Route, we compute the addition of fixed Time (fixedT in RouteType) and time proportional to the distance (dT) which is store as the time in minutes to do 100 meters on a given type of road. So there we assume that the difference of altitude correspond to the length of the road between 2 points (i.e., the road is a line between the points).


Station de ski de l'arc
Roads enabled :
Cabine
Traveling :
I go from :
villaroger
I go to :
25
Generate Path
Path :
Duration : 93,23 minutes
-> 2 by Char lift
-> 3 by Char lift
-> pre-saint-esprit by Blue piste
-> 11 by Char lift
-> col-de-la-chal by Special chair lift
-> 25 by Blue piste
col-grand-renard
grand-col
col-de-la-chal
arc1800
arc1600
arc2000
col-des-frettes
arpette
pre-saint-esprit
deux-tetes
aiguille-rouge
villaroger
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