Project Idea - BCPC

I. Introduction

BCPC: Bring Cities Back to the People

This Project is about creating train lines and tables for routes in countries with a good range of train lines from Full to no coverage, it will provide an estimate cost and building time and recommendations for the train lines and tables.

II. Learning

Learning phase consists of multiple steps.

A. Train Line Plotting

The algorithm will pull up train routes of countries requested by the user and zoom into the lines in the country and fetch train tables of countries being fetched. It will section the line into existing line types

i. Line Name

ex: Oostende - Eupen

ii. Line Type & Sectioning

Medium speed between Oostende and Leuven ~ 140 km/hr

High Speed between Leuven and Liege - 200 km/hr top speed

Low speed mountain climbing between Liege and Eupen ~ 100 km/hr

iii. Train-Table

Fetches the times train arrive at each destination (1 train at a time per destination)

iv. Route-Formatting

Plotting the route with markers and sectioning the routes into line types and rail categorizations (quays, tunnels, overground bridges, raised on ground, directly on ground, etc)

v. Terrain Overlay

Overlays the terrain and evelation over the tracks to understand why the train line took this path and not another

vi. Platform Logging & Train Platform stopping + Cross Overs

Logs the number of platforms in the stations where the lines stops at and logs the platform number where the trains stop at and see if the line they follow makes sense for the platform they stop at.

vi. Cost Logging

Fetching the cost it took to create this line (in total with inflation)

B. Logging

Creates a smart logging for all the information while avoiding unecessary things, each line has its own file UNLESS they share similar routing protocols.
Example: Oostende - Eupen Line share similar tracks as Blankerberge - Genk

Similar Lines include from Bruges till Leuven!

We call these the dense map reference lines

The dense map reference lines are lines such as the ones in Brussels where almost every train line passes through Brussels, the Brussels Line will then be used as reference to many lines in this form.

Plot till brussels - Reference
Brussels - Brussels and beyond

III. Inference

In the inference we take everything we learnt from the Learning call and we just do it.

A. Referencing

Referencing is the first thing that should happen when queueing a new country.

This means that the model will search in the files that we learnt about of similar countries or even cities that have similar features to the country that we queued as well as cities with these countries. Wow yeah a mouthful.

Basically.

Country looks like the country: Switzerland

City looks like something similar to Zürich so I'll do something similar to that

B. Terrain Projections

Projects the terrain over the country to make sure everything is correct

C. Train Station Positioning + Accessibility

Will speculatively choose the best position for a train station and chose the type of station to be placed (underground, overground elevated, quayed, on-the-ground). Noting the fact that the most amount of people that it can handle are the people who can come by foot = intergration with other trams + busses (future application and feature)

D. Speculative Rail Plotting

The algorithm will starts speculatively plotting the tracks starting from the stations of great interest to the country and population at large, the user will also provide a budget with the input and it is also recommended to do that. the model will plot the lines in a smart way taking into account the track slopes, gradients and everything it learnt from previous learning epoch into plotting the line.

E. The NIMBY Issue

If we can plot station and rail tracks spiratically we would, but we are doing this for the people, existing high density locations with no room to breathe ex: Beirut have the hardest time when it comes to plotting railway.

1. Analyse the ground for remains: remains are preserved by law and should not be demolished

2. Land Value is High and its hard to buy land from people without re-homing first

3. Countries such as Lebanon are exremely hard to build raitracks in as the tracks "ruin the shoreline view"; however, placing the tracks inwards will increase cost of the entire line and also threaten the mountain rage views = nobody wins.

4. Solutions? In the case of lebanon adding light rail in between the highway with 3rd rail powering is the best solution. Reduce highway size by 1 lane. on each direction and add a light rail track with 3rd rail powering.

F. Rail Optimizations

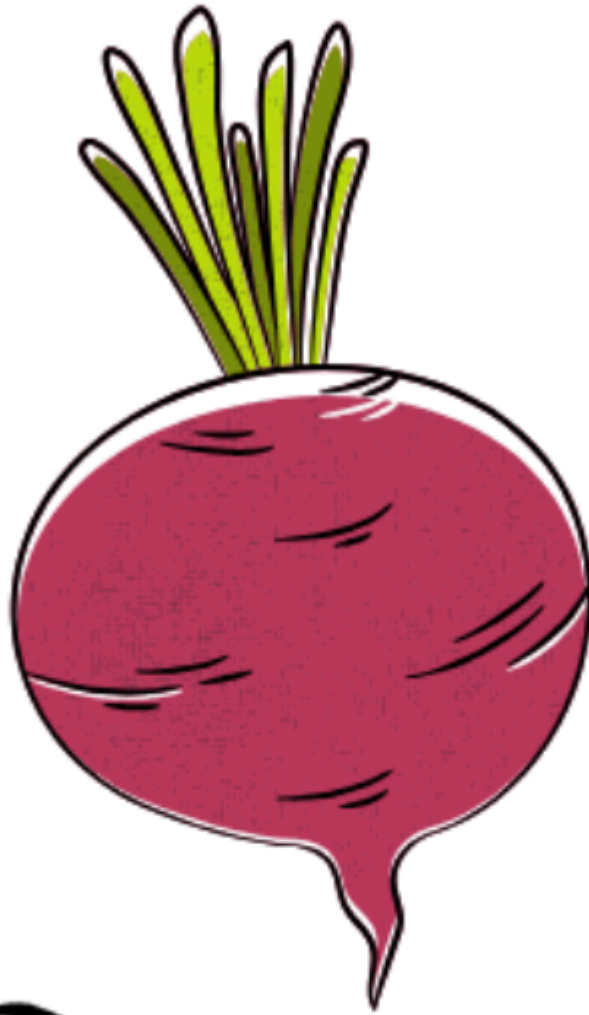Asking the question of "What else can we do?"

Can we shave off 10k here by doing a tunnel going through the mountain rather then around it?

Can we add a stop here to add 10k more people to the plan? Possible 50k (including from sub-municipalities around the city)?
Can we make the tracks on this section concrete instead of ballasts because its on a mountain?

G. TrainTable

After everything has been plotted we will calculate the train table with arrive and departure times of each line name with starting and ending destination

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