CITS3002 Project

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Created Using

- OS: Manjaro Linux x86_64
- Kernel: 5.6.15-1-MANJARO

How to use

The makefile is location in the src directory

Place timetables in timetables directory

Place ./startstations.sh in the src directory and run from there

There shouldn't be any issues (apart from maybe edge cases) everything works for me :)

Searching for invalid station is slow with python

The python implementation is very slow

For a network of 20 stations (using time)

Python

```
curl "localhost:4013/?to=JunctionZ"
0.01s user 0.00s system 0% cpu 3:11.71 total
```

C++

```
curl "localhost:4013/?to=JunctionZ"
0.00s user 0.00s system 0% cpu 6.631 total
```

Yes Python is 3 mins

So it works, just the python is a bit slow :)

The total number of paths for a network with k edges between $(1 \le k \le S - 1)$ where S is the number of stations is given by

$$(S-2)(S-3)...(S-k) = \frac{(S-2)!}{(S-k-1)!}$$

So finding if a valid path to a node exists is quite a long process. Interestingly the maximum number for $S \ge 3$ stations is $\approx (S-2)!e$