Public Transport Connections

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/FAW.

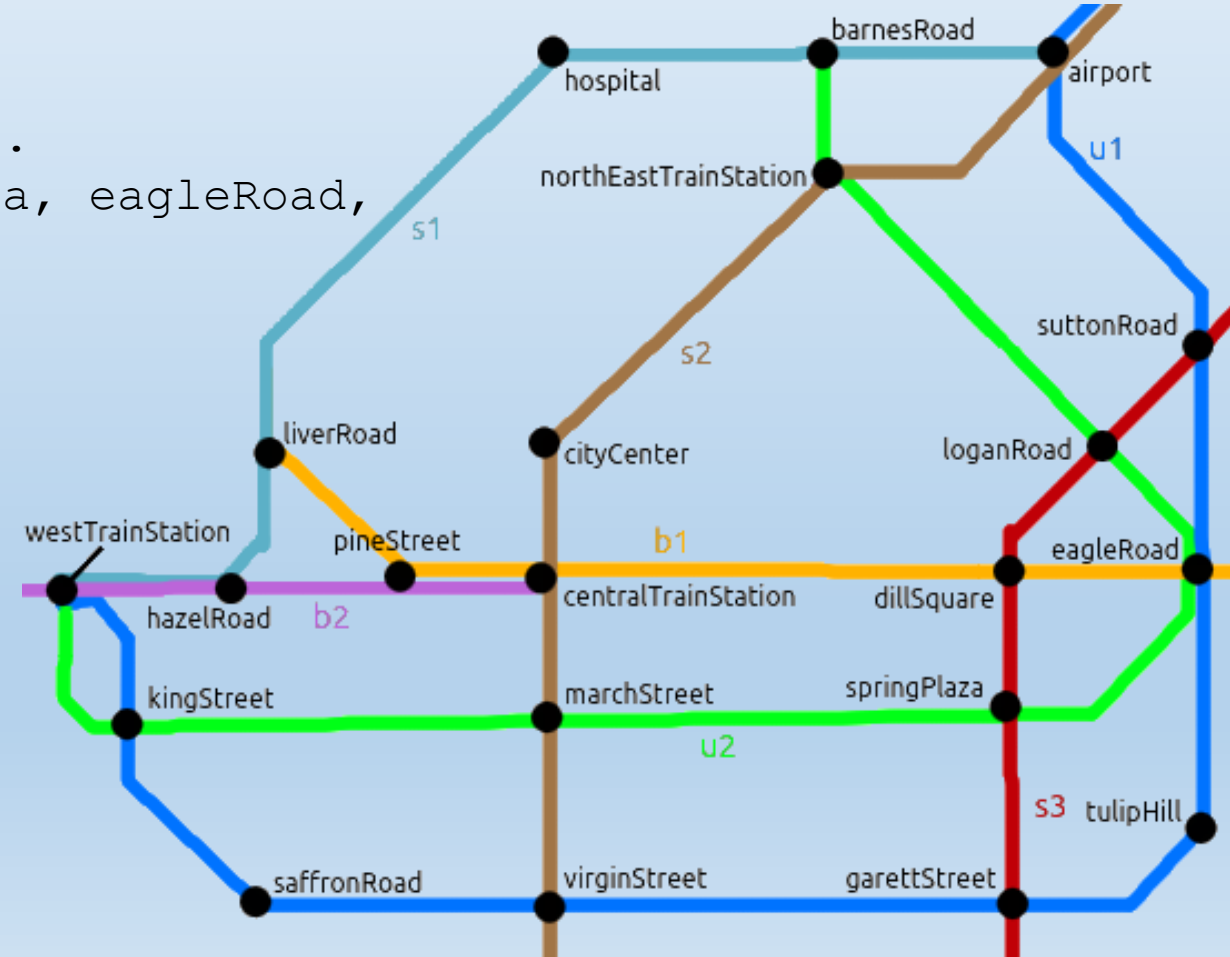
Main usage

Public Transport Connections

Girou - Martin

```
?- route(pineStreet, airport, Route).
Route = [pineStreet, liverRoad, hospital, barnesRoad,
airport].
```

```
?- route(kingStreet, loganRoad, Route, Time).
Route = [kingStreet, marchStreet, springPlaza, eagleRoad,
loganRoad],
Time = 24.
```



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The code

Declaring the stops

```
stop(airport, [u1,s1,s2]).
stop(suttonRoad, [u1,s3]).
stop(eagleRoad, [u1,u2,b1]).
stop(tulipHill, [u1]).
stop(garettStreet, [u1,s3]).
stop(virginStreet, [u1,s2]).
stop(saffronRoad, [u1]).
stop(kingStreet, [u1,u2]).
stop(westTrainStation, [u1,u2,s1,b2]).
stop(barnesRoad, [u2,s1]).
stop(northEastTrainStation, [u2,s2]).
stop(loganRoad, [u2,s3]).
stop(springPlaza, [u2,s3]).
stop(marchStreet, [u2,s2]).
stop(hospital, [s1]).
stop(liverRoad, [s1,b1]).
stop(hazelRoad, [s1,b2]).
stop(cityCenter, [s2]).
stop(centralTrainStation, [s2,b1,b2]).
stop(dillsquare, [s3,b1]).
stop(pineStreet, [b1,b2]).
```

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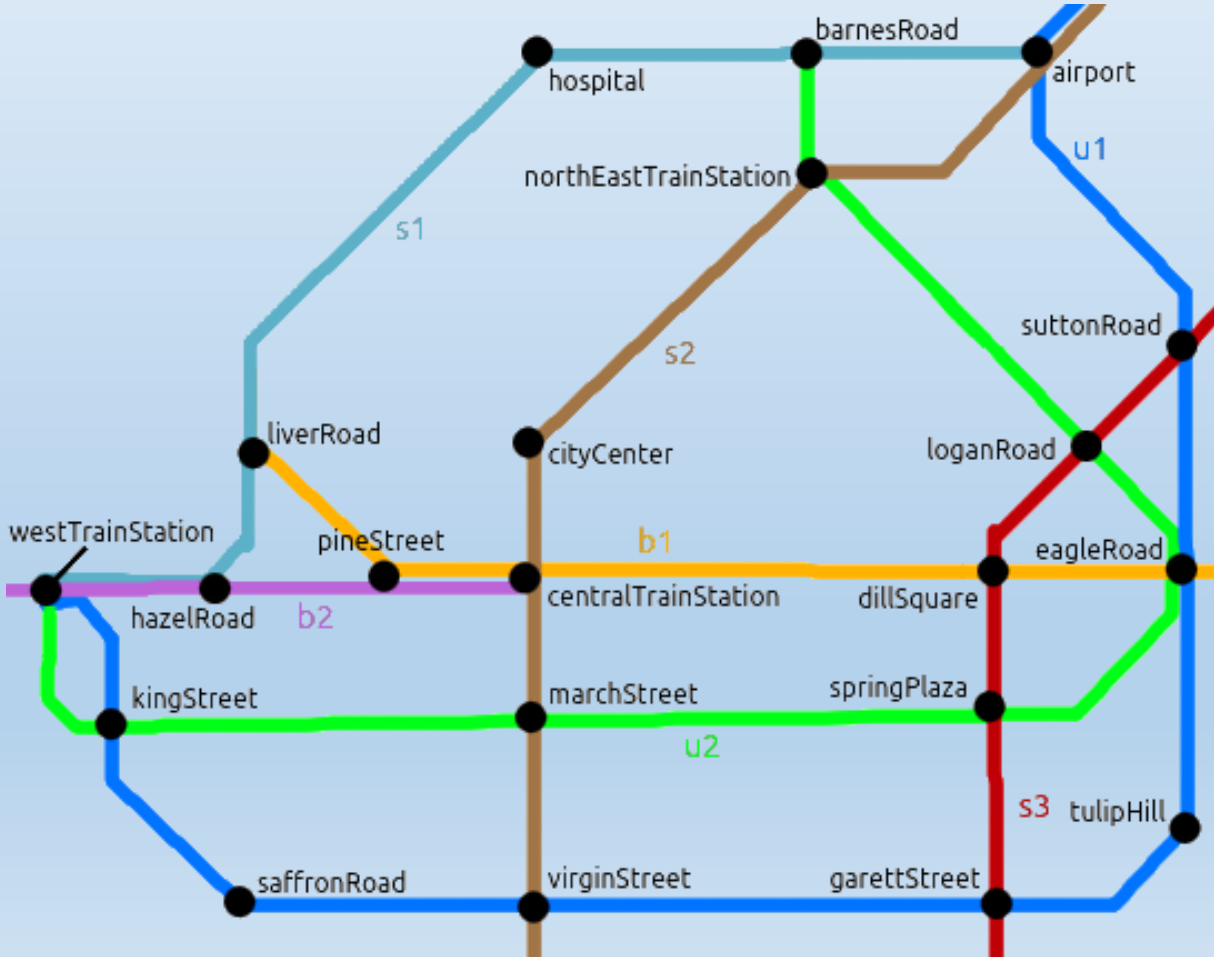

The code

Declaring adjacent stops

```
adjacent(X,Y):- adjacent_stops(X,Y).
adjacent(X,Y):- adjacent_stops(Y,X).

          %u1

adjacent_stops(airport,suttonRoad).
adjacent_stops(suttonRoad,eagleRoad).
adjacent_stops(eagleRoad,tulipHill).
adjacent_stops(tulipHill,garettStreet).
adjacent_stops(garettStreet,virginStreet).
adjacent_stops(virginStreet,saffronRoad).
adjacent_stops(saffronRoad,kingStreet).
adjacent_stops(kingStreet,westTrainStation).
```

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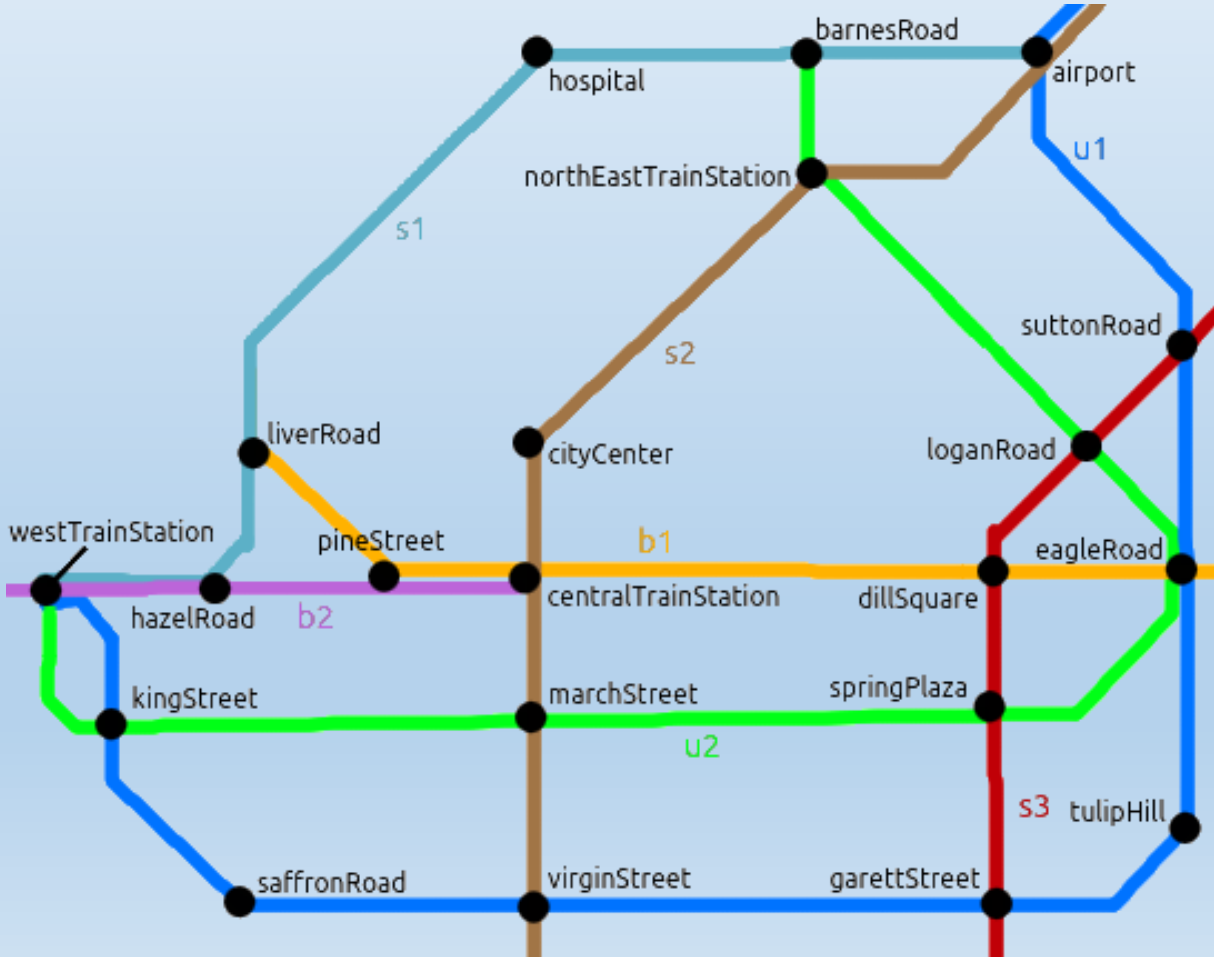


The code

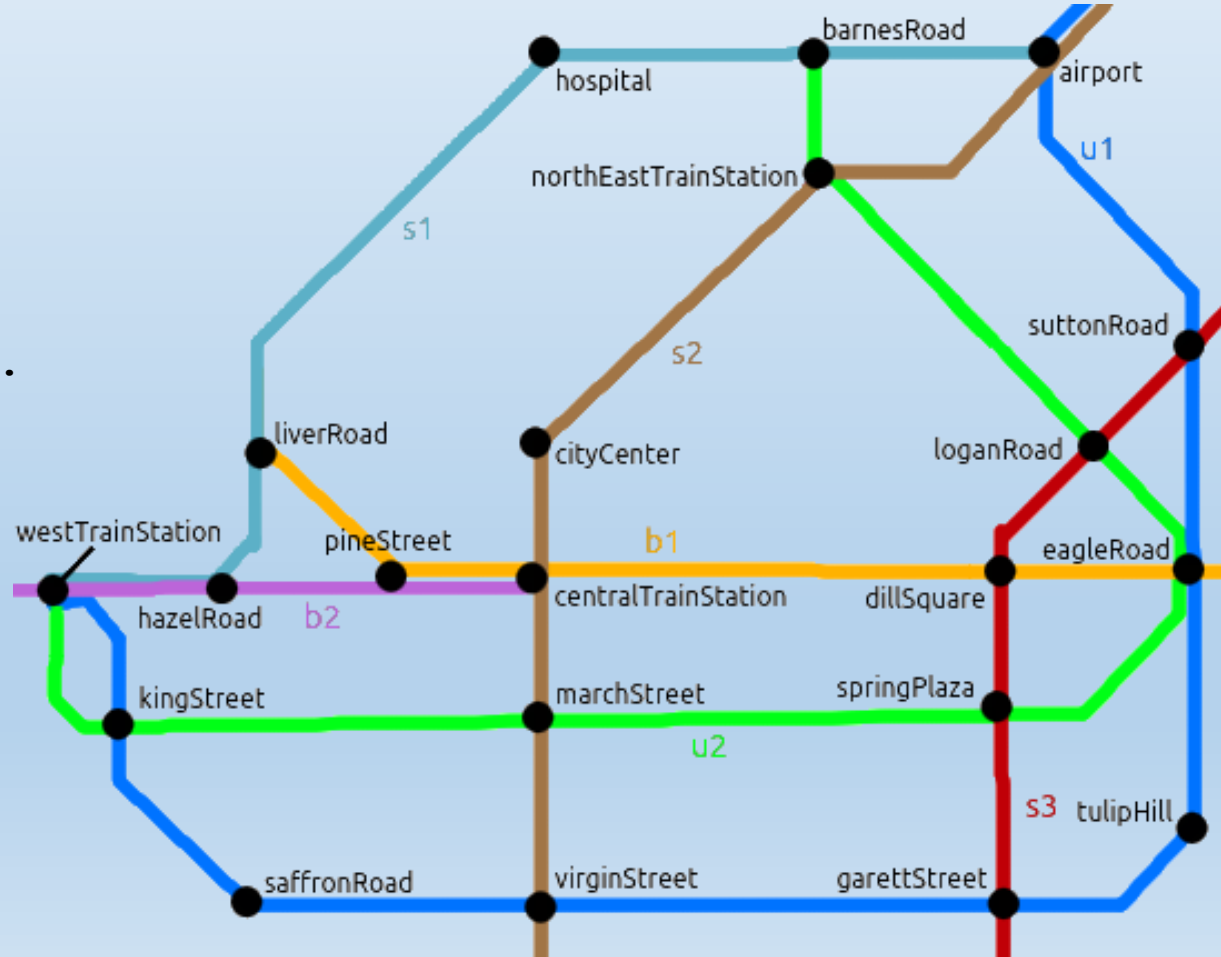
The sameLine rule

Girou - Martin

```
sameLine(Stop1, Stop2, Line):-
        stop(Stop1, Line1),
        stop(Stop2, Line2),
        member(Line, Line1),
        member(Line, Line2).
```

```
?- sameLine(saffronRoad, suttonRoad, Line).
Line = u1.

?- sameLine(airport, pineStreet, Line).
false.
```



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The code

The findAllStops rule

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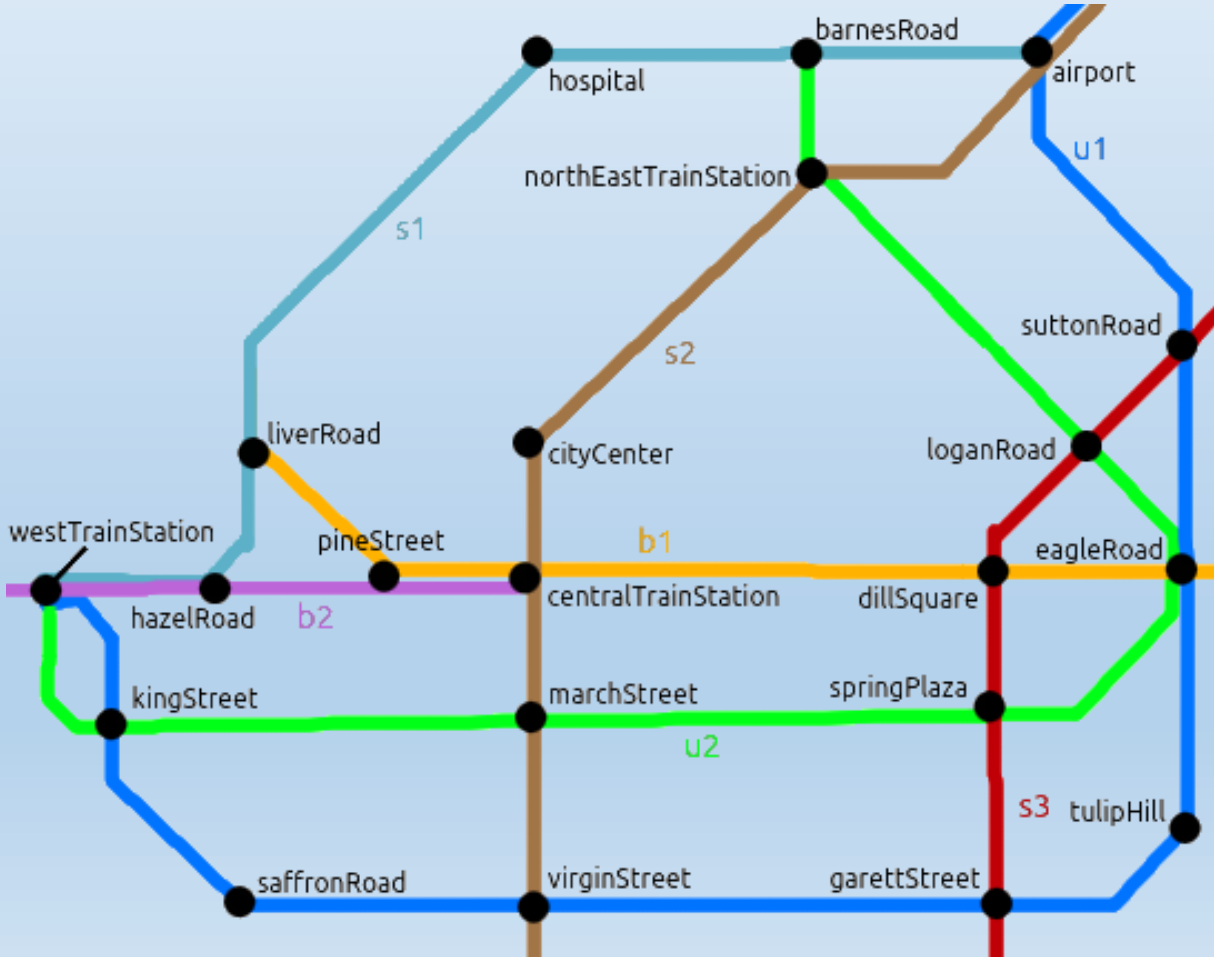
```
findAllStops(Line, ListOfStops):-
        findall(Stop,(stop(Stop,NewLine),
        member(Line, NewLine)), ListOfStops).
```

```
?- findAllStops(b2, Stops).
Stops = [westTrainStation, hazelRoad,
centralTrainStation, pineStreet].
```



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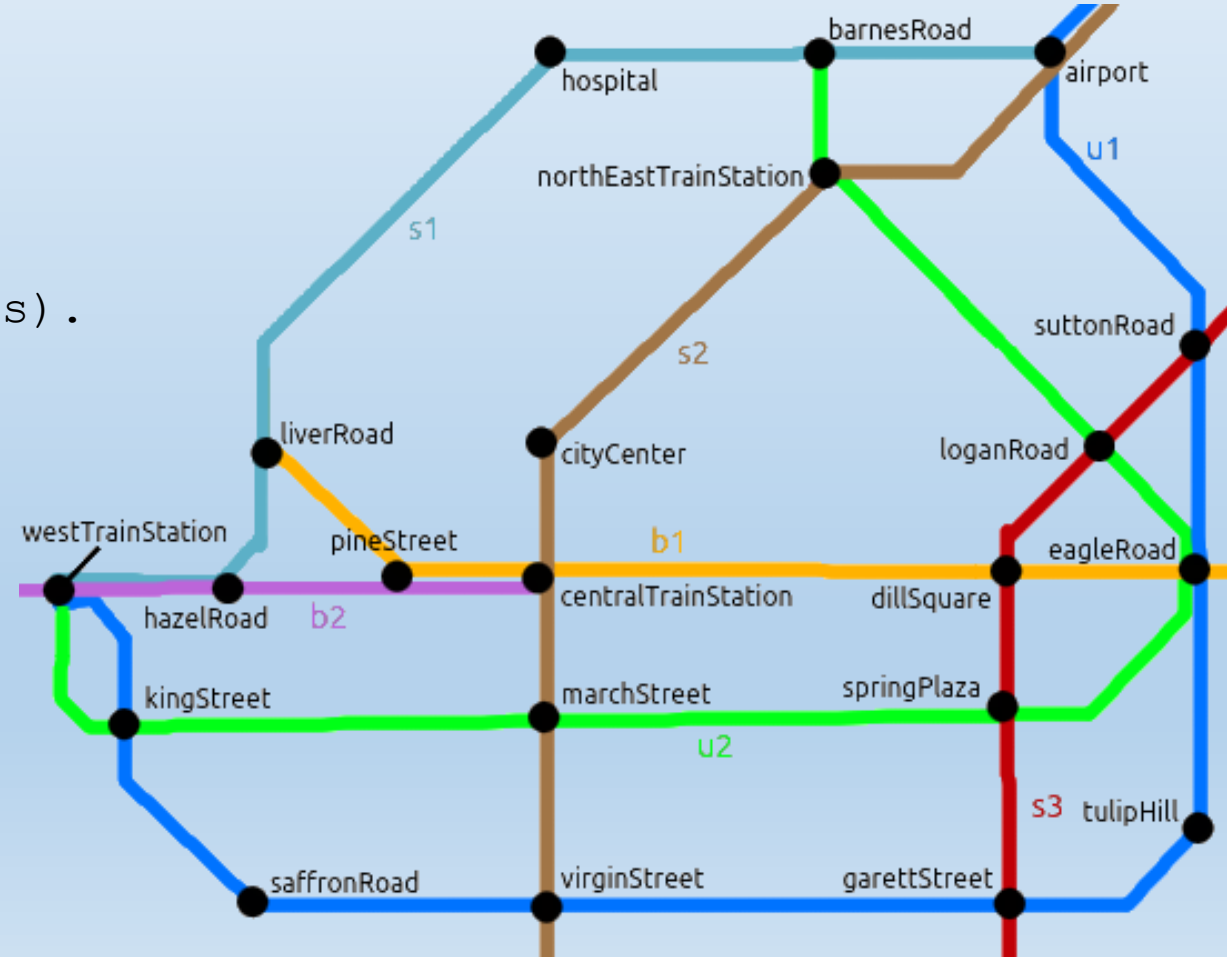
The code

The numberOfLines rule

Girou - Martin

```
numberOfLines(Stop, NumberOfLines) :-
        stop(Stop,Line),
        length(Line, NumberOfLines).
```

```
?- numberOfLines(centralTrainStation, Lines).
Lines = 3.
```



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The code

The route calculation

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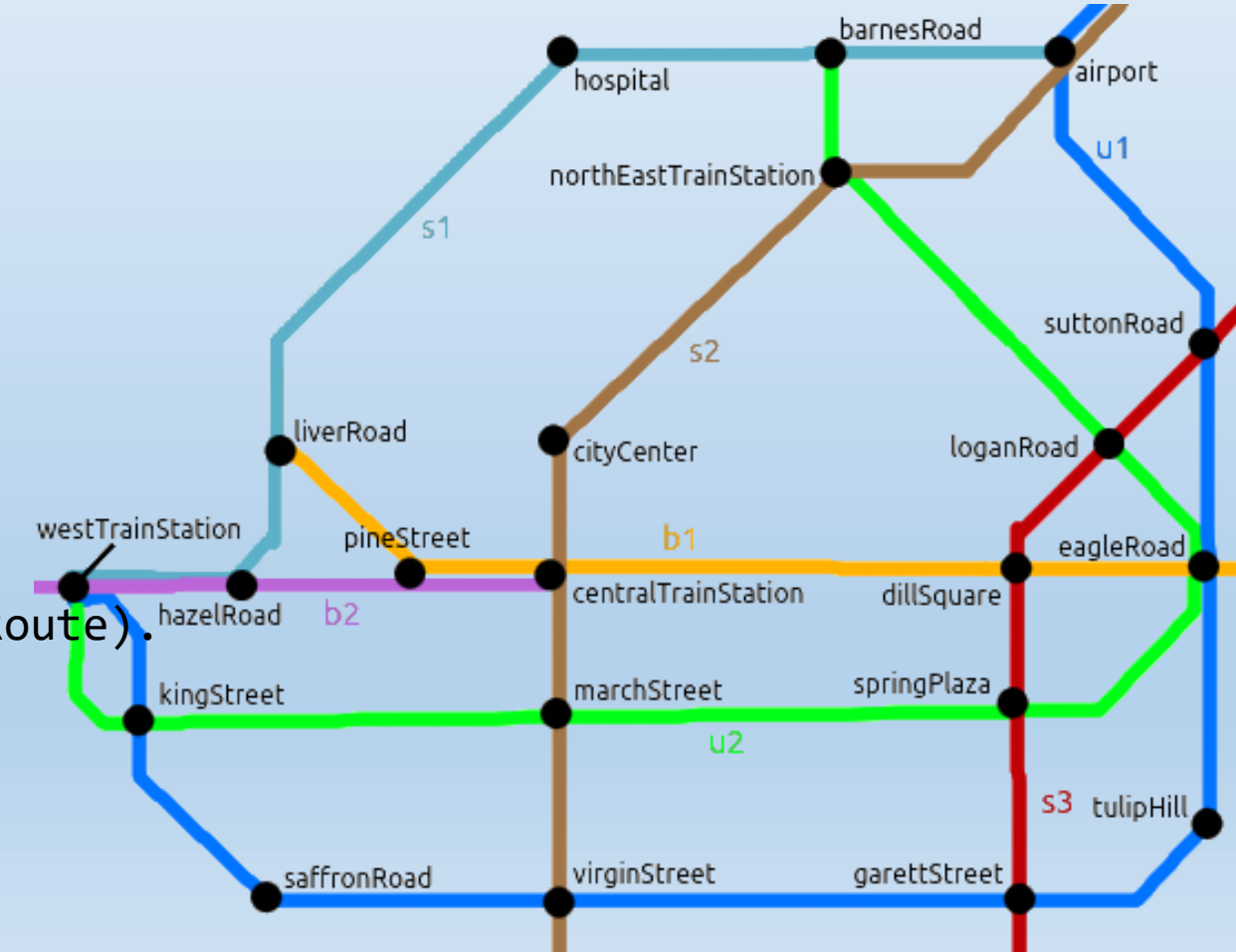
```
calcRoute(Stop1, Stop2, Route):-
        tempRoute(Stop1, Stop2, [], Return),
        reverse([Stop2|Return],Route).

tempRoute(Stop1, Stop2, Temp, Route):-
        adjacent(Stop1, Stop2),
        \+member(Stop1, Temp),
        Route = [Stop1|Temp].

tempRoute(Stop1, Stop2, Temp, Route):-
        adjacent(Stop1,Next),
        Next \== Stop2,
        \+member(Stop1, Temp),
        tempRoute(Next, Stop2, [Stop1|Temp], Route).
```



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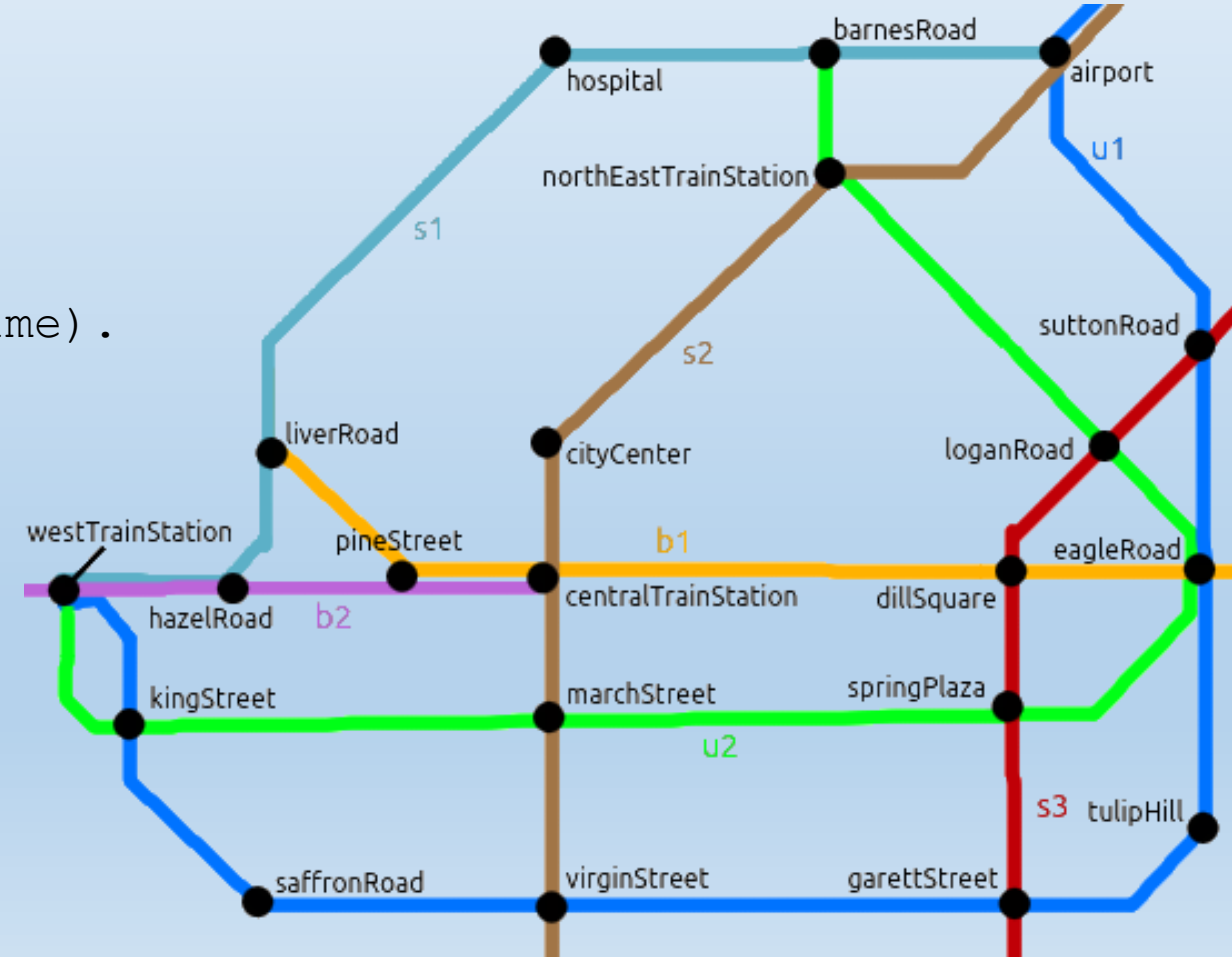
The code

The routeTime rule

Girou - Martin

```
routeTime(Stop1, Stop2, Route, RouteTime):-
        calcRoute(Stop1, Stop2, Route),
        length(Route, Time),
        RouteTime is (Time -1) * 6.
```

```
?- routeTime(airport, eagleRoad, Route, Time).
Route = [airport, suttonRoad, eagleRoad],
Time = 12 .
```



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The code

The route rule

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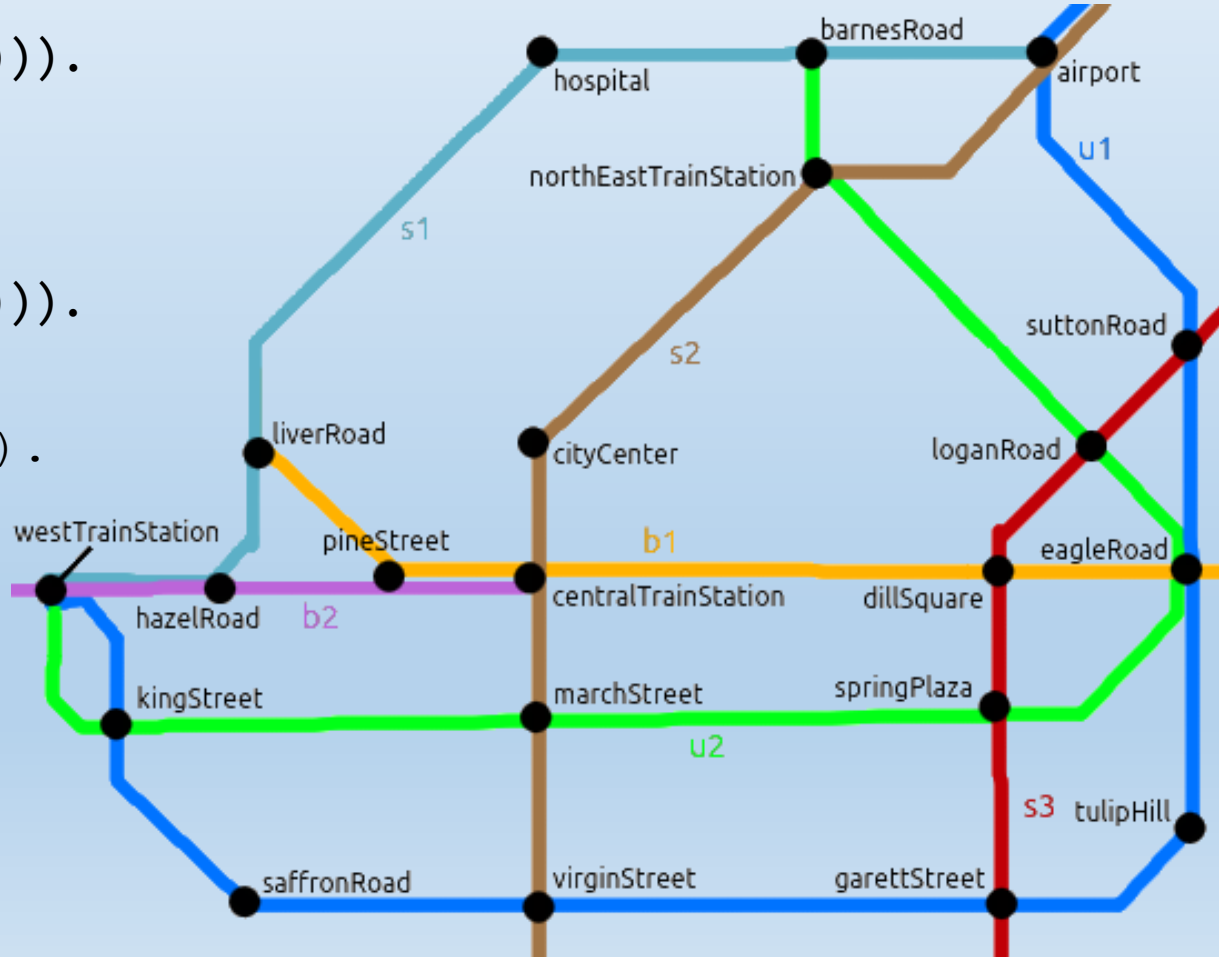
```
route(Stop1, Stop2, Route):-
        limit(1, (order_by([asc(Time)],
        (routeTime(Stop1, Stop2, Route, Time))))).

route(Stop1, Stop2, Route, Time):-
        limit(1, (order_by([asc(Time)],
        (routeTime(Stop1, Stop2, Route, Time))))).


?- route(hospital, pineStreet, Route, Time).
Route = [hospital, liverRoad, pineStreet],
Time = 12.
```



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Things we could change

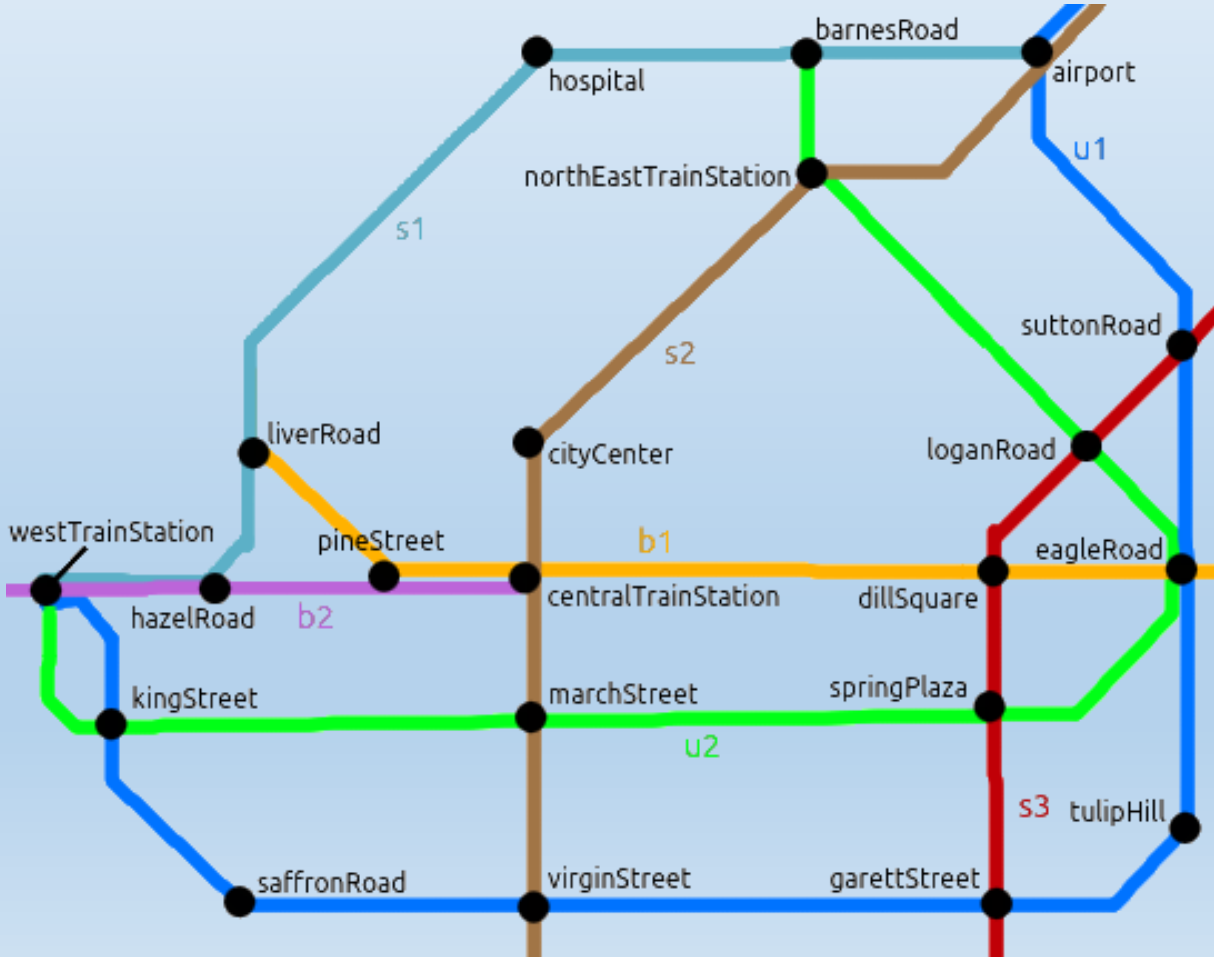
Public Transport Connections

Girou - Martin

Having a custom time between each stop

Outputing where to change line and to which line

Helping the user avoiding changing lines when not necessary



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Thank you