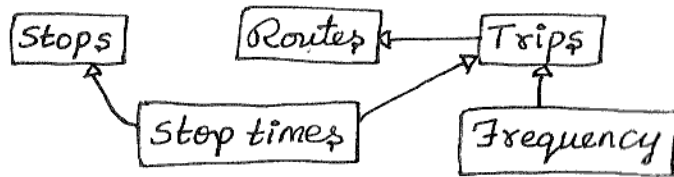


GTFS Data for Non-scheduled Routing



Trips - Every ^{Route} trip has one up trip & one down trip

Stop times - Gives relative time of stops.

Non-scheduled Routing

Input :

- * Source
- * Destination

Output :

- * A list of changeovers and routes connecting them.
(Optimize for high frequency)

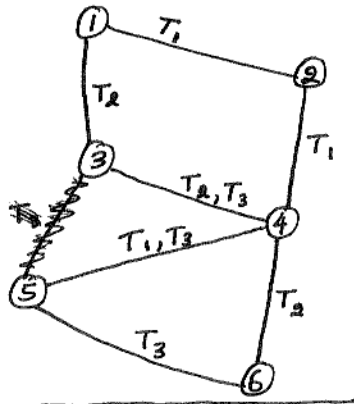
How?

1. Create and populate Frequency Graph that is a Complete Graph with 'n' stops and $n(n-1)$ edges.
2. Find list of changeovers corresponding to maximum frequency of services.
3. Find Routes between changeovers and order them by frequency.

Eg: Stops : 1, 2, 3, 4, 5, 6 in headway seconds

Trips : Frequency

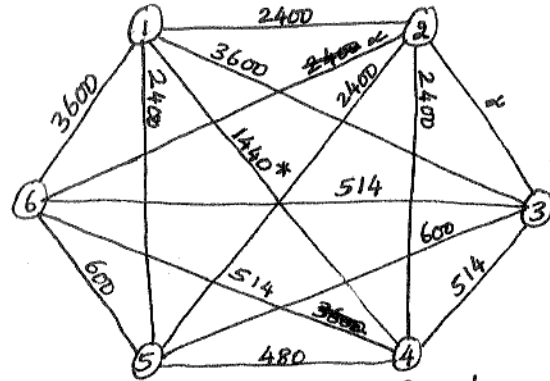
T_1	-	1	2	4	5	2400
T_1'	-	5	4	2	1	2400
T_2	-	1	3	4	6	3600
T_2'	-	6	4	3	1	3600
T_3	-	6	5	4	3	600
T_3'	-	3	4	5	6	600



Adjacency Graph

Stop-times:

	1	2	3	4	5	6
T_1	0:00	0:20	-	0:40	0:50	-
T_2	0:00	-	0:15	0:30	-	0:45
T_3	0:00	-	0:00	0:15	0:30	0:40



Frequency Graph

To / From	1	2	3	4	5	6
1	-	2400	3600	1440	2400	3600
2	2400	-	∞	2400	2400	∞
3	3600	∞	-	514	600	514
4	1440	2400	514	-	480	514 3600
5	2400	2400	600	480	-	600
6	3600	∞	514	3600 514	600	-

Frequency table

* - T_1 & T_2 cover stops 1 & 4. \therefore

$$\text{Effective freq at 1-4} = \frac{1}{\frac{1}{f(T_1)} + \frac{1}{f(T_2)}}$$

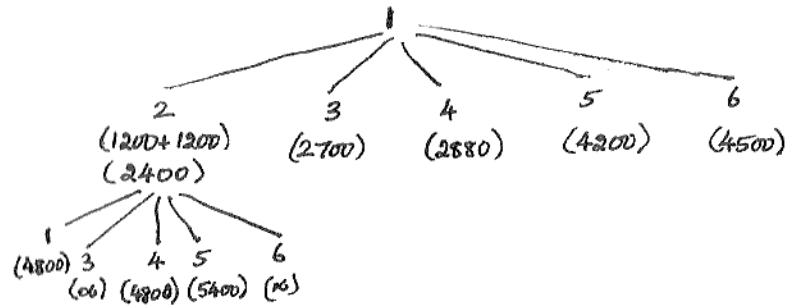
Travel Time Graph:

Similar to Frequency Graph but edges are ~~not~~ expected travel time between two stops.

$|A| =$ weighted average of time delta from A to B in stop-times where weight is frequency of individual trips.

From \ To	1	2	3	4	5	6
1	-	1200	900	2160	3000	2700
2	1200	-	∞	1200	1800	∞
3	900	∞	-	900	1800	2314
4	2160	1200	900	-	840	1414
5	3000	1800	1800	840	-	600
6	2700	∞	2314	1414	600	-

Travel Time table



State space tree for Routing