

Automatic Transit Route Generation

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1 Introduction

A transit system consists of a set of N lines $[L_1, \dots, L_N]$. These lines are owned by M operators $[Op_1, \dots, Op_M]$. Naturally,

$$M \leq N$$

In the following, I propose a method to automatically generate a set of routes for each of the operators so that every stop in the system. A relevant use-case for this is to minimize the amount of time spent on hanging up timetable posters.

2 Outline of Method

A path P consists of n_p stops. For each path, there are one or more (transit) lines, L_i , that operates it. P can either be a *single-line path (SLP)* or a *multi-line path (MLP)*. An SLP is the path of a line that shares none of its stops with other lines. On the other hand, an MLP is a path that two or more lines share.

An arbitrary MLP can be visualized as

$$MLP_1 \left\{ \begin{array}{l} Op_1 \left\{ \begin{array}{l} L_1 \\ L_2 \end{array} \right. \\ Op_3 \left\{ L_8 \\ Op_6 \left\{ \begin{array}{l} L_3 \\ L_9 \\ L_{11} \end{array} \right. \end{array} \right.$$