

# Digital Developer

Candidate Coding Task

# Introduction

## Summary

A problem designed to test problem solving and programming skills

## Expected time to complete

4-6 hours (please do not spend any longer but rather document any ideas you didn't implement).

## Technology

You can use any language, technology, or framework (including pseudocode) to design, build, and document your project. Please make your solution available on Github in a private repository for us to review. It will also be beneficial if you describe how we can build and run your project.

As a part of the project description, we also looking for you to provide critique of your application design for technology choices, robustness, and scalability. Please document any considerations that you made even if you haven't implemented those, including what improvements can be done to your code.

## Problem Description

North-South Railways operates a number of rail services around New Zealand. Because of historical reasons the tracks are "one-way". Where rail services are offered in both directions they are done over separate tracks and are not necessarily the same cost to travel.

We require you to design/develop a simple application which will help provide customers with information about the trips we can offer. In particular we have demand from our customers to find the shortest route between two towns.

## Requirements

Allow the user to enter a start and end station (which could be the same station) and then calculate details of the shortest route (shortest distance to travel).

## Data

Our rail network is represented as a directed graph where a node represents a station and an edge represents a route between two stations. The weighting of the edge represents the distance to travel between the two towns. The towns are codenamed using the letters of the alphabet from A to J. A route between two towns (A to B) with a distance of 12 can be represented as AB12.

For the test data you should use the following matrix:

