# Developer role technical test

This test is about finding routes between two locations. To simplify things, locations are represented as single letters, e.g. A.

An example data set is provided as well as data generator code written in PHP. The solution can be implemented however the candidate chooses. It does not need to be written in PHP and can use any appropriate language or technology. Candidates should provide a working solution to the problems below along with all source code.

### Q1: Given an ‘origin’ and ‘destination’, order the possible journeys by the lowest number of exchanges.

* The result set should contain all possible routes from ‘origin’ to ‘destination’
* The journeys should be ordered by the lowest number of exchanges between the two locations, for instance **A->B->C** is more preferable than **A->B->D->C**
* Return an error if the journey is not possible

### Q2: Given an ‘origin’ and ‘destination’ and a departure time, order the possible journeys by the cheapest total price.

* The result set should only contain journeys starting at or following the departure time
* The result set should contain all possible journeys from ‘origin’ to ‘destination’, and the total price for each journey. For instance
  + **A->B->D->C = 500**
  + **A->B->C = 1000**
* The result set should be ordered by the lowest total journey price

### Q3: Given an ‘origin’ and ‘destination’ and a departure time, order the possible journeys by the shortest total duration time.

* The result set should only contain journeys starting at or following the departure time
* The result set should contain all possible journeys from ‘origin’ to ‘destination’, and the total travel time required for each journey. For instance
  + **A->B->C = 12**
  + **A->B->D->C = 15**
* The result set should be ordered by the shortest total journey time

## Definitions

See routes.json and flights.json sample data.

### Route:

A route is a direct connection between 2 locations with an ID and a duration (in hours). e.g.

**{**

**"route\_id": "A\_C",**

**"from": "A",**

**"to": "C",**

**"duration": 8**

**}**

### Flight:

A flight is a possible way to travel along a direct route with a provider, price, and a departure time (in days and hours from now)

**{**

**"flight\_id": 1,**

**"route": "A\_C",**

**"provider": "Virgin",**

**"price": 210,**

**"departure": "+4 day 5 hour"**

**}**

### Journey:

A journey is a possible way to travel from an origin to a destination, via flights serving the route/s between those locations. A journey could be a direct route, e.g. A->C or a set of routes, e.g. A->B and B->C. All the possible routes between A to C can be:

1. **A->C**
2. **A->B->C**