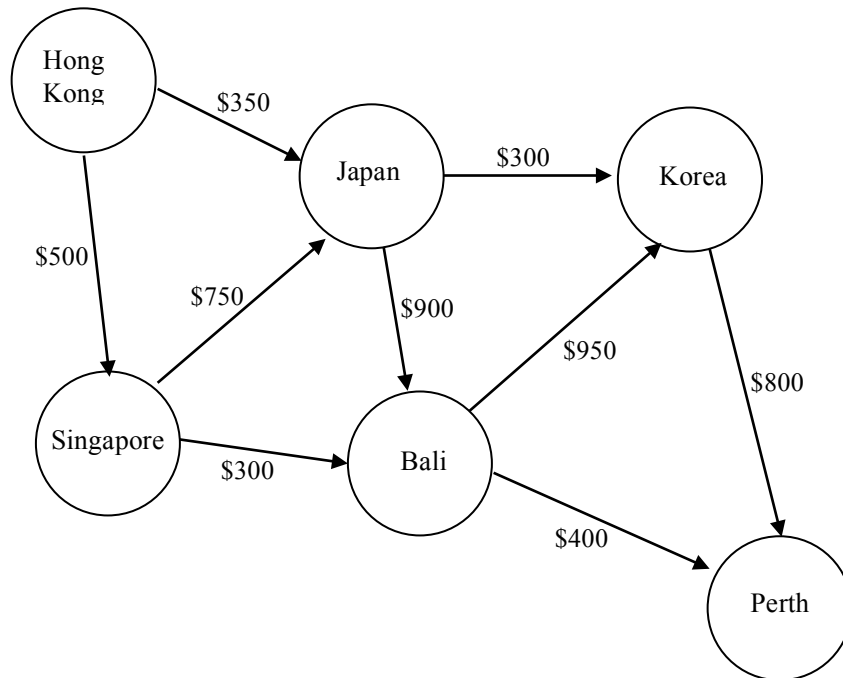


Shortest Path

1. In Mathematics, an algorithm is a method for solving a problem using a sequence of instructions.
Define the Brute-force and Greedy methods and list the advantages and disadvantages of each method.

2.



The diagram below shows the cities that you can pass by when travelling from Hong Kong to Perth. The flight fares to travel between cities are also indicated.

Using the Brute-force and Greedy methods, list all the possible answers of each method and identify the route that has the lowest cost from each method.

3. If you were to use the Mass Rapid Transit (MRT) to travel from one station to another station, list all the possible routes using the Brute-force method. Which route would you take? Why?
You have to select one station from the NEL line and the other station from the Circle line.

As a criterion for selection, we will look at the duration of the trips (ie the total travelling time on each route). [Duration of the trip is taken to be the time taken in a moving MRT, excluding the time taken to wait for a train, transfer from trains and waiting in a train.]

Answers:

1. Brute-force : Solves a problem without any structure or pattern and has typically many solutions making, making a list of possible solutions.

Greedy : Solves a problem with a structure and has typically one solution.

Brute-force

Advantage : simple to carry out

Disadvantage : inefficient

Greedy

Advantage : may take a shorter time to arrive at solution

Disadvantage : may not lead to the desired solution, given the set of criteria