Report Spain Map

Explanation of the problem

Give the representation of a solution (answer) of the problem, as explained during the course.

The spain map is represented by several cities that in some way are connected to each other.

X = {$x_1, x_2, x_3 \ldots x_i \ldots x_n$ } where *n* represents the number of cities and *i* represents one city.

The goal with the Spain map is to calculate the shortest distance from the initial city to the goal city.

$$d = \sum_{x_i}^{x_j} \mathrm{k_j}$$

d represents the distance, x_j represents the goal city, which is Valladolid, x_i = represents the initial city, which is Malaga, k_j represents the distance from the current city to the next city to go to, k_{nj} represents the distance from previously visited cities and the goal city, which is Valladolid. K_{nj} is used for A*.

Give the equation of f(n)used in Gready Best-first Search (or Explain how to calculate f(n))

The equation for gready best-first is f(n) = h(n), where *n* represents the current city. h(n) is a function which uses a straight-line method. The straight-line method in this equation represents the distance between the current city and the goal city.

Give the equation of f(n)used in A* (or Explain how to calculate f(n)).

The equation for A* is f(n) = g(n) + h(n). *n* represents the start node, h(n) represents the cheapest estimated path cost from n to the goal, g(n) represents the path cost so far (from start node to *n*), and f(n) represents the total estimated cheapest path cost from n to our goal.

Explain both algorithms and the differences between them.

In gready best-first we are looking for the best first city to go to. So for each city we go to we only check the shortest path from the connected cities to the goal and go to the connected city with the shortest distance to the goal, until we have reached the goal. But within A* we are looking for the optimal path. It will tell how long it is to its connected cities and how long it is from those cities to the goal. Which will give the optimal path because maybe one of the connected cities got a shorter distance to the goal, but it is very far from the current position to that city.