In the graph below, the initial state is node A and the goal state is node H. The cost of the operators is shown in the arcs.

Let's suppose we use the heuristic Manhattan-distance (same application as in the 8-puzzle problem from a starting node to a final node through the quadrants in the map); for example, the Manhattan-distance between city A and city D is 3; the Manhattan-distance between city E and H is 2. Let $h(n)$=Distancias_Manhattan(n). Answer the following questions:
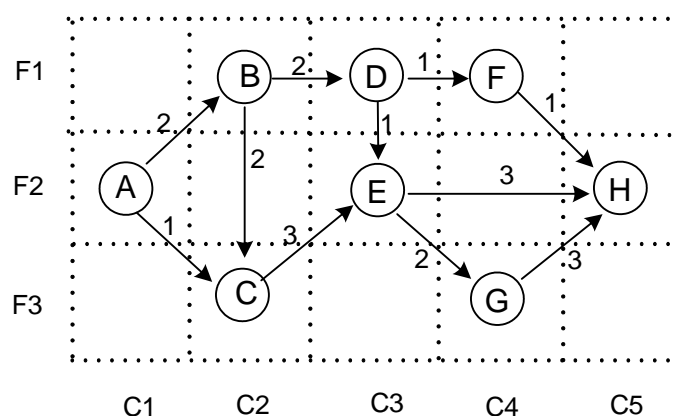
1) We want to find a solution to go from city A to city H that traverses the minimum possible number of nodes. Which strategy would you use?. Write the nodes of the solution path from A to H. Show the number of generated nodes, indicating how many of them are repeated nodes as well as the number of expanded nodes. Apply control of repeated states.

   Note: In case of two nodes with the same f-value, expand first the node that comes alphabetically before. Avoid repeated states.

2) Consider again the same problem of going from city A to city H. If we apply a depth-first expansion up to maximum depth m=4. Which solution will this search find? How many nodes are generated (including the repeated ones) and how many expanded?

   Note: In case of two nodes with the same f-value, expand first the node that comes alphabetically before. Avoid repeated states (discard deeper nodes).

3) If we apply an iterative deepening (ID) algorithm for this problem, which solution would ID find? Show the solution path as well as the number of generated nodes in each iteration. Apply control of repeated states.

4) Apply an algorithm of type A ($f(n)=g(n)+h(n)$). Which solution path will this algorithm find? Say how many nodes are generated (including the repeated ones), how many nodes are repeated and how many expanded. Is the solution found the optimal one?

   Note: In case of two nodes with the same f-value, expand first the node that comes alphabetically before. Avoid repeated states.

5) Is the heuristic function h(n) admissible? And consistent? Justify your answers.