

## Quiz 2

24 September 2012

1. Compute the *Manhattan distance* between each of the following pairs of locations on the grid below:

A → C      -----                      B → D      -----  
 A → D      -----                      B → E      -----

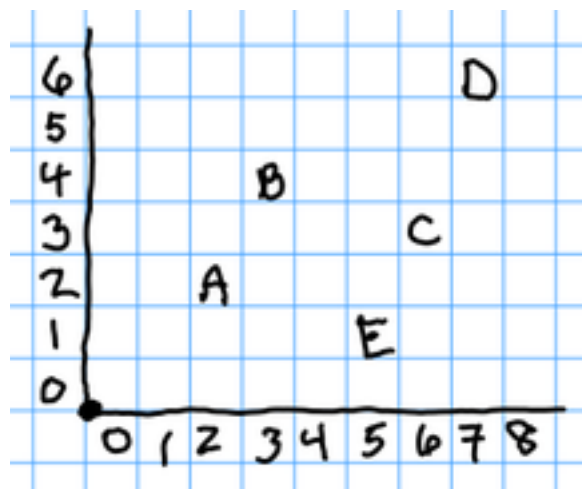


Figure 1:

2. If you need to start from A and visit all of the other labeled locations on the above grid, which route *minimizes* the total Manhattan distance traveled? (This is the Traveling Salesman Problem, but for the purposes of this question, suppose you do **not** need to return to A in the end.)

3. Convert the map of South America into an *interference graph*. This is a graph where each country is a node, and there is an edge between nodes corresponding to countries that share a border. There are 13 countries shown; you may abbreviate them in your graph using the first two letters.

Once you have drawn the interference graph, assign a *color* to each country. You may use only the colors Red, Yellow, Green, or Blue (abbreviated by the first letter). As on a typical map, no two adjacent countries should have the same color.



Figure 2: