LAB Assignment 10
CS205
All Pair Shortest Path

1. In a city, there are multiple regions from people of different clans. All the regions have a name and color(out of three colors i.e. red, green, blue). The roads connecting these nodes are created according to the name of these regions. If the number of common characters between two regions is >=2, then there is a road. The road cost is calculated as sum of the total number of characters in both the names. For example: a region has name 'alpha' and another region has name 'betaa'. The direction of the road will be from ‘betaa’ to ‘alpha’(as k is 2 here) as per the lexicographic order of the kth character of the names of region, where k is the number of common characters between both the regions(in case of same characters consider the edge from larger name to smaller name). Number of common characters is 2, so there will be a road in the same direction. The weight, representing the cost of the path of the edge will be 5+5=10. Due to differences among some regions, few roads are marked as expensive depending upon the color of the region. For example, road that goes from green to blue are expensive, so you need to spend double for these roads. Additionally, few roads are cheaper like. a road between same color regions. The cost of these roads are negated cost of the calculated cost. For example, if the computed cost between two regions of the same colour is 10 then it will be negated and final cost will be considered as -10. Due to presence of negative cost roads, there is a chance of negative cycle. A negative cycle is one where total cost of a cycle is negative. Take input from user the number of regions, name of regions and color of regions and construct a graph. Print whether there is a negative cycle or not. NOTE: Final graph might be either connected or disconnected.

   Input Format:
   Number of regions
   Next n line read following details
   Name of the region, color of the region
   Output Format:
   If there is any negative cycle then find out the cycle and print edges of that cycle in following style
   V1->V2->V3->....->Vn->V1