# Routing Algorithm - Assignment 3

Due date: 2/4/18

## Instructions

This will be a group assignment. You can either do it alone or in groups of 2. Do not pair up again with your teammate from previous assignment.

## Assignment

The assignment is to understand a simple static routing algorithm.

## Problem

In this problem, you will create a static routing algorithm (using Dijkstra's algorithm). You will be given the computer network as a header file (see below). You will have to create a routing table for this network and then wait for user input. The user can now input a source (A) and destination (B) IP address (see below for input format). You will now output the IP address of all machines through which a packet originating from A will traverse before it reaches B.

## Header File format (filename: network.h)

```
const string IPaddress = "60.80.33.10, 67.100.3.8, … "
const string Routers =
"120.100.3.5,200.30.5.6,60.80.33.21;120.0.0.1,20.1.1.0;…"
const string InterfaceDistance =
"(120.100.3.5,120.100.3.3,50),(200.30.5.6,200.30.5.7,20),…"
```

## Header file explanation

The objective of header file is to give the input network.
Assumptions: We assume that all subnets have subnet mask of 24 bits. Therefore all IP addresses which have the same 24 bits in the prefix form a subnet (see Figure below).
Also assume that all nodes in a subnet are directly connected to the router (having same subnet mask). That is, it is a star topology.
1. The string IPaddress gives the list of IP addresses in the network. It also includes the interface IP address of the routers.
2. The string Routers identify the routers using the interface IP addresses
3. The string InterfaceDistance gives the distance (or cost) of sending a packet from the one router interface to another (or vice versa). Assume the distance between all unmentioned nodes as having a distance of 1.

## Input and Output

Give source and destination IP: 67.100.3.8, 60.80.33.10
The packet from  67.100.3.8 to  60.80.33.10 goes via the following router interfaces: x.y.z.t, ….
Give source and destination IP:

LAN

67.100.3.3

120.100.3.3          120.100.3.5          60.80.33.21

LAN

X          X

a.b.c.d

200.30.5.6

a.b.c.e          X          200.30.5.7

67.100.3.8

p.q.r.s

60.80.33.10

LAN