SPL 151 Assignment 1

TA in charge Tal Achimeir

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Dead line - 13/11/2014 23:59

The aim of this assignment is that you will get familiar with the basics of C++.

Before You Start

1. You must submit all of the assignments in pairs. In addition, you must submit assignment 1 and assignment 2 with the same partner. Therefore please find a partner as soon as possible and **create a submittal group** in the submission system. Once the submission deadline has passed, you will be unable to create submission groups even if you have an approved extension.
2. Read the assignment together with your partner and make sure you understand the tasks. Please do not ask questions before you complete reading the assignment.
3. Write a skeleton of the assignment.

Road Maintenance Support

The state of the roads in Be'er Sheva is deteriorating, and the municipality decided to fix some of those roads. Ben-Gurion University was asked to help by checking the stress on those roads as a function of the number of routes passing on that road and its length (calculation will be explained later on).

You will receive information about the roads and traffic routes around the city in the following format:

1) Roads**.conf** – This file defines the roads that pass around the city. A road is represented by two junctions it connects.
   File format:
   Junction_1,Junction_2,Length
   - *Junction_i* – Name of the i-th junction as strings (j1,j2 etc…).
   - *Length* – The length of the road as integer.
2) Routes**.conf** – This file will define routes that are known to be busy around town (means thousands of cars are taking those routes everyday).
   File format:
   Junction_1,Junction_2,…,Junction_n
   - *Junction*_i – A junction along the way.

Your task is to use this information in order to calculate the busiest routes.

You may assume all inputs are valid and consistent! Each line will be separated with a new line character – '\n'.
You may assume that adjacent junctions in each route are connected by a road that is defined in Roads.conf and also that there are no loops in the routes.

Reading the configurations

In order to read the configuration files you will need to use the standard C++ libraries *iostream* and *fstream*. You can save the information read in vectors (as learned in class). Please do not use arrays as they are not safe.

Calculating road stress

After the information is read you can start processing the information. For each road you have to calculate the amount of routes that pass through it and save its stress factor defined by: $Stress\ factor = \frac{No.Passing\ routes}{Length}$.

Output

Write the output in a file named *RoadStress.out* in the following format:

Junction_1,Junction_2,Stress factor

Submission

Your submission should be in a single zip file called "student1ID-student2ID.zip". The files in the zip should be set in the following structure:

src/
include/
bin/
makefile

src directory should include all .cpp files.
include directory should include all the header (.h) files that are used in the assignment..
bin directory where the compiled objects (the .o files and the assignment executable) should be placed when compiling your source files (should be empty).
makefile should compile the cpp filess into the bin folder and create an executable and place it also in the bin folderbin (should be named *RoadStress*).

The *makefile* should properly compile on the department computers, the objects should be compiled with the following flags:

-g –Wall –Weffc++

The submissions must be made in pairs.

After you submit your file to the submission system, re-download the file that you have just submitted, extract the files and check that it compiles.

Questions

All questions regarding the assignment should be published in the assignment forum. Please search the forum for similar questions before publishing a new one.

Question regarding the assignment will not be answered by mail.

Please note that before using the forum you must register here.

Delays

In case of milluim, illness, etc. please send an email to the course mail majeek@cs.bgu.ac.il.

The mail should include both partners name and IDs, explanation and certification for your illness / milluim.

We will not answer other mail in the course mail.