8ᵗʰ Assignment – Graphs: Maximum flow in transport networks

Instructions

- Download file **cal_fp08_CLion.zip** from the course's Moodle area (it contains folder **lib,** folder **Tests** with files **tests.cpp** and **Graph.h**, and files **CMakeLists** and **main.cpp**)

- Open a *project* in CLion, and select the folder containing the files as described above

- Do "*Load CMake Project*" over the file *CMakeLists.txt*

- Run the project (**Run**)

- Note that *unit tests in this project may be <u>commented</u>*. If this is the case, then uncomment the tests as you make progress in the implementation of your solutions

- *You should follow the order of exercises in this practical class*

- Implement your solution in the respective *.cpp* files, in case you're not implementing a template. Templates must be implemented in the respective *.h* files

- Important note: If you need access to external files in I/O mode, you may need to set up their location by defining the CLion IDE's "Working Directory" environment variable, selecting it from the menu Run > Edit Configurations… > Working Direcory

- The parts to be coded in file **Graph.h** are marked with **TODO** and may include comments and hints on how to implement them

Exercises

You should edit the classes in *Graph.h* in order to complete the exercises below.

a) Implement the following method in the **Graph** class:

```
void fordFulkerson (T source, T target)
```

This method implements the Ford-Fulkerson algorithm to find the maximum flow from the source vertex *source* to the sink vertex *target* in the graph. Hint: See the pseudo-code and explanation about the needed data structures in the slides of the theoretical classes.