FIT3155: Lab questions for week 12

Objectives: Concepts from week 11

1. Write a program to generate a random flow network (with single source and single sink) with integer capacities. Output the random flow network to a file in the following format:

   (a) First line contains the number of vertices.

   (b) Second line contains the index of the source vertex.

   (c) Third line contains the index of the sink vertex.

   (d) Subsequent lines contain 3 numbers each, in the following format

   $$u \quad v \quad c$$

   where the first two numbers denote the directed edge from the vertex with index u to the vertex with index v. The last column c gives the capacity of that directed edge $\langle u, v \rangle$.

2. Write a program to solve the max-flow problem. Use as input the file generated from the program above. For the augmenting path computation try both:

   - Dinic's heuristic (path with fewest edges), and
   - Edmond-Karp's heuristic (path with largest bottleneck).

   Output both the max-flow value and the vertices that define the min-cut. (Your program should sanity check that, for the input flow network, min-cut capacity = max-flow.)

```
-=0=-
 END
-=0=-
```