

Problem 1.

- Implemented are versions of Edmonds-Karp and Push-Relabel max flow algorithms in C++.
- Both produce the correct output for all provided inputs.
- Included is the makefile used to produce the executable, `a.out`, using Clang++. By default, the executable runs Edmonds-Karp on the provided input. The optional flag `-p` can be passed in as a command line argument to run Push-Relabel.
- `test.py` is a test script which runs `a.out` on all the input files in the current working directory. It prints out the execution time and whether the output file `my*.out` matches the desired output file `*.out`. Again, the optional flag `-p` can be passed to run all inputs with Push-Relabel, i.e. `./test.py -p`
- Worst case for Edmonds-Karp was 07.in which took 0.178 sec.
- Worst case for Push-Relabel was 11.in which took 1.954 sec.

| Input File | Edmonds-Karp (s) | Push-Relabel (s) |
|------------|------------------|------------------|
| 1 | 0.002 | 0.004 |
| 2 | 0.092 | 0.010 |
| 3 | 0.094 | 0.020 |
| 4 | 0.008 | 0.112 |
| 5 | 0.092 | 0.049 |
| 6 | 0.177 | 0.028 |
| 7 | 0.178 | 0.208 |
| 8 | 0.068 | 0.083 |
| 9 | 0.084 | 0.155 |
| 10 | 0.064 | 0.358 |
| 11 | 0.117 | 1.954 |
| 12 | 0.125 | 1.901 |
| 13 | 0.128 | 0.090 |
| 14 | 0.088 | 0.137 |
| 15 | 0.079 | 1.196 |
| 16 | 0.063 | 1.137 |

