

CSE450 Programming Assignment

To be able to find the maximum capacity of flow from LAX and to NYC. We must use the Ford–Fulkerson. However, in this case, we cannot just simply use Ford-Fulkerson blindly and take each node as the airport and the capacity as is. Because there is timing involved where the entire flight duration must be within 24 hours starting from 6am to 5:59am next day. Only compatible flights that can be counted, say if the start time for first flight is 10am and reaches the mid stop at 1pm, then the next flight must strictly be after 1pm or just right at 1pm.

So, with that constraint, we must construct the graph in a way such that instead of using just 10 nodes for all the airports, we need 10 x 24 nodes with each node representing the start flight time for a particular airport. Say (LAX, 6am), (LAX, 7am), (LAX, 8am) ... Then we will add edges from one node to another only if they are compatible in terms of timing unless it's a direct flight from an airport to another.

We will then also take all the LAX flight from 6am till 5:59am next day as the source and try to reach any of the NYC nodes (destination) with timing from 6am till 5:59am next day. And sum up all the capacity. So, there is not just 1 source and 1 destination but many sources to many possible destinations we must compute using Ford-Fulkerson algorithm.

The result I obtained is 9220.

Note that a linux based system is required. g++ is used to compile the main.cpp file. Then the executable can be ran using ./a.out command.