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Graph report

Maximum Flow :

To compute the Maximum Flow in a Flow Network we used the Ford-Fulkerson algorithm. In this algorithm the is a while loop with this condition "*there exists an augmenting path p*".

This augmenting path can be computed with different heuristics. In our application we implemented 3 heuristics :

- The Breadth First Search
- The Depth First Search
- Floyd-Warshall

The Breadth First Search algorithm works as follow. Its starts from the starting node, then it explores its successors, then the unvisited successors of the successors and goes on. If the program finds the ending node, it returns true, else it returns false.

The Depth First Search algorithm works as follow. Its begins with a starting nodes and then, it goes in the first successors that he founds. And it goes on for the successors of the successors. Just as the BFS, if the ending node is found it returns true else false.

The Floyd-Warshall algorithm works as follow. It computes for each pairs of nodes the weight of the path between these two nodes. If the algorithm find a shorter path, it replaces the old path with this new one. In our algorithm, this method compute an array of parents suck that each nodes has its father. Thanks to this we take the ending node and we look a its ancestor, is we find the starting node, the algorithm return true else false.

When the user wants to compute the Maximum Flow in a Flow Network, the application gives him the choice of which heuristics he wants to use. The program then compute the augmenting path with the chosen heuristic.

During the computing of the Maximum Flow, residuals graphs are created. These graphs are stored in the "SAVE" file.