

Assignment 3: Modified Dijkstra's algorithm

Study the modified Dijkstra's algorithm that has been applied to find the largest bottleneck in a flow network. The code is already given in week8.ipynb file.

Q 1: State the loop invariant of the largest bottleneck algorithm in terms of what to be maintained with the variable "neck" and "fromNode" in the code.

Ans 1: The loop invariant of Modified Dijkstra's algorithm is "The neck variable contains maximum capacity flows from the handle to the found not handle node and fromNode variable contains the where the flow comes from".

Q 2: Explain in your own word about the action between lines 19 and 49 of the code. Why these actions make progress to the loop invariant?

Ans 2: By the code from file "week8.ipynb" lines 19 to 49 I realized that. We are looping through all of the elements in the graph variable to find none-negative values that are more than zero which stands for the flow capacity from handle node to found not handle node then we need to compare if the capacity flow that we found more than the previous value (Found new maximum capacity) then we need to update the value and replace it into the neck variable.