INFORMATICS INSTITUTE OF TECHNOLOGY

UNIVERSITY OF WESTMINSTER

Informatics Institute of Technology

Department of computing

(B.Eng.) in Software Engineering

Module: 5SEMG002C

Algorithms

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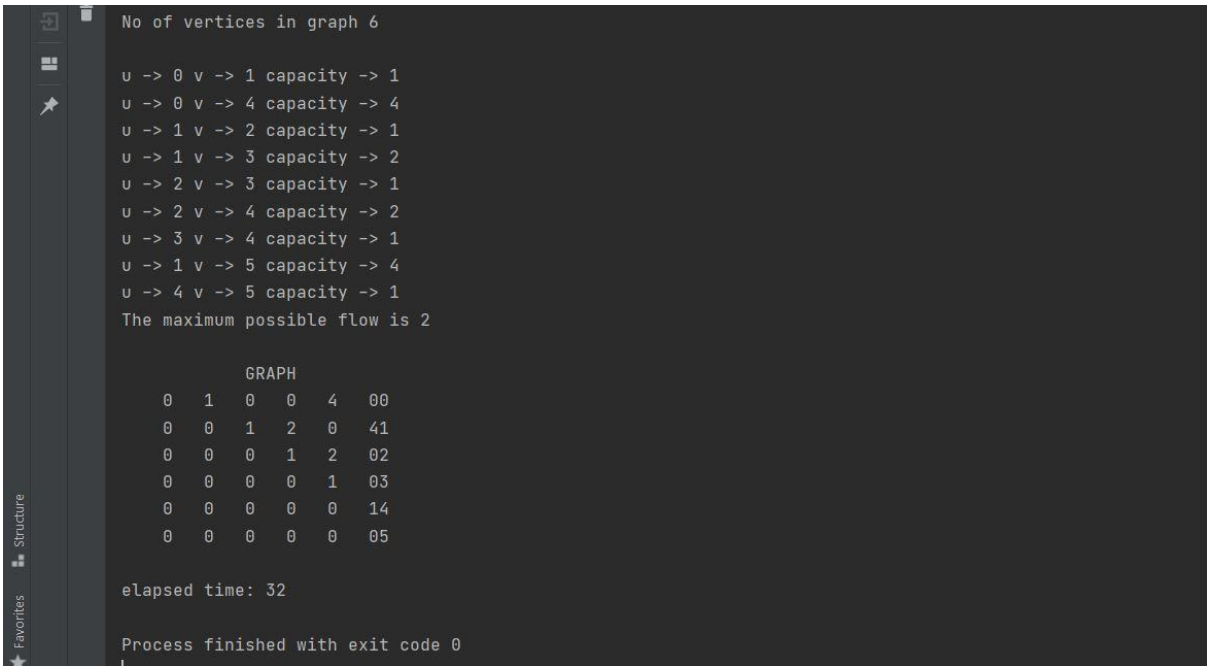
A) Ford-Fulkerson algorithm is a one if the best approach for solving a problems (greedy algorithm) and for calculating the maximum possible flow in network or a graph.
With this we can detect maximum flow from start vertex to sink vertex in a graph.
Its one of the most widely used algorithms in optimization of flow network.

Breath First Search(BFS) Algorithm is used to graph data or traversing structures. The main idea of this is Traverse node in layers. Its selects a single node in a graph and then select all the nodes witch are connected to the selected node.
One of the problem by using this, In in cycles each node will be visited infinite times but by using a Boolean visited array for each node will fix the issue.

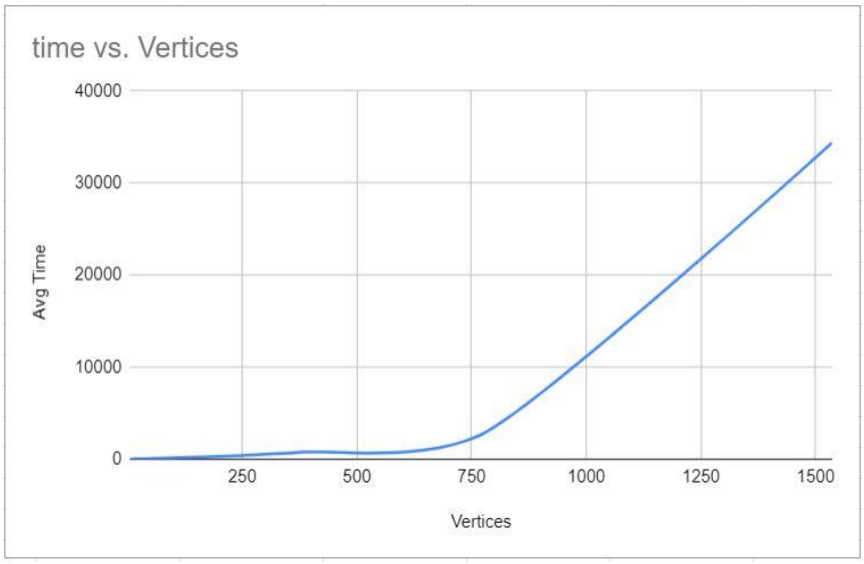
To store the data or use as a data structure using a 2D array(Multidimensional Array) will helps for the most problems. This is mostly used to store a table-like structure. this array is not like the normal arrays that we are used to, this has two pairs of square brackets, one for raw and one for the column. Easily can store matrix type data.

B)



Vertices	Time (Try 1)	Time (Try 2)	Time (Try 3)	Avg time (ms)
6	12.51	13.21	13.85	13.19
12	22.92	22.45	23.23	22.86
24	29.62	30.65	29.32	29.86
48	64.06	66.02	66.32	65.46
96	141.94	140.94	141.55	141.47
192	285.76	285.35	288.92	286.67
384	746.01	786.01	788.24	773.42
768	2584.38	2583.43	2609.66	2592.49
1536	11185.51	11186.77	12005.42	34377.7

Vertices	Time (Avg)	time ratio	Log2 time ratio
6	13.19		
12	22.86	1.73	0.79
24	29.86	1.3	0.37
48	65.46	2.19	1.13
96	141.47	2.16	1.11
192	286.67	2.02	1.01
384	773.42	2.69	1.42
768	2592.49	3.35	1.74
1536	34377.7	13.26	3.72



This graph will represent the Vertices with their executing time. In the algorithm there is nested for loop inside a while loop. This should be O(N2). Overall behavior of the graph is a polynomial.