Laboratory practice No. 5: Graph Implementation

Ana Sofia Gutiérrez Tejada
Universidad Eafit
Medellín, Colombia
asgutierrt@eafit.edu.co

Santiago Hidalgo Ocampo
Universidad Eafit
Medellín, Colombia
shidalgoo1@eafit.edu.co

3) Practice for final project defense presentation

3.1 To understand the structure of data, it must be understood that a Vertex object stores the attributes of a given vertex (id, name, x coordinate and y coordinate). On the other hand, an arc-like object has the following attributes: starting vertex, arrival vertex, distance and name. The graph is represented by a matrix, but to make it more optimal we use a HashMap where the key was the Id of a vertex and the value a vertex. After this procedure we add arcs to the determined positions. For practical purposes the code represents the map of the example presented.

3.2 Representing the Medellin map of numeral one with adjacency matrices would consume a memory of O(n^2), where n is the number of vertices.

3.3 We use HasMap to represent the vertices, we take the Id of the vertex as the key. In addition to this problem, data is accessed in an efficient manner

3.4 Exercise 2.1: The basis of the algorithm is the DFS (Depth first search) path. In addition to traveling the graph, there is a vector with values that represent the two colors (0 or 1). In the end, if the final vector has two equal adjacent values, then it is not bicorable.

3.5 Exercise 2.1: The complexity is O(n^2)

3.6 n is the number of vertices

4) Practice for midterms

4.1

***Note:** The blanks represent zero*

PhD. Mauricio Toro Bermúdez
Professor | School of Engineering | Informatics and Systems
Email: mtorobe@eafit.edu.co | Office: Building 19 – 627
Phone: (+57) (4) 261 95 00 Ext. 9473

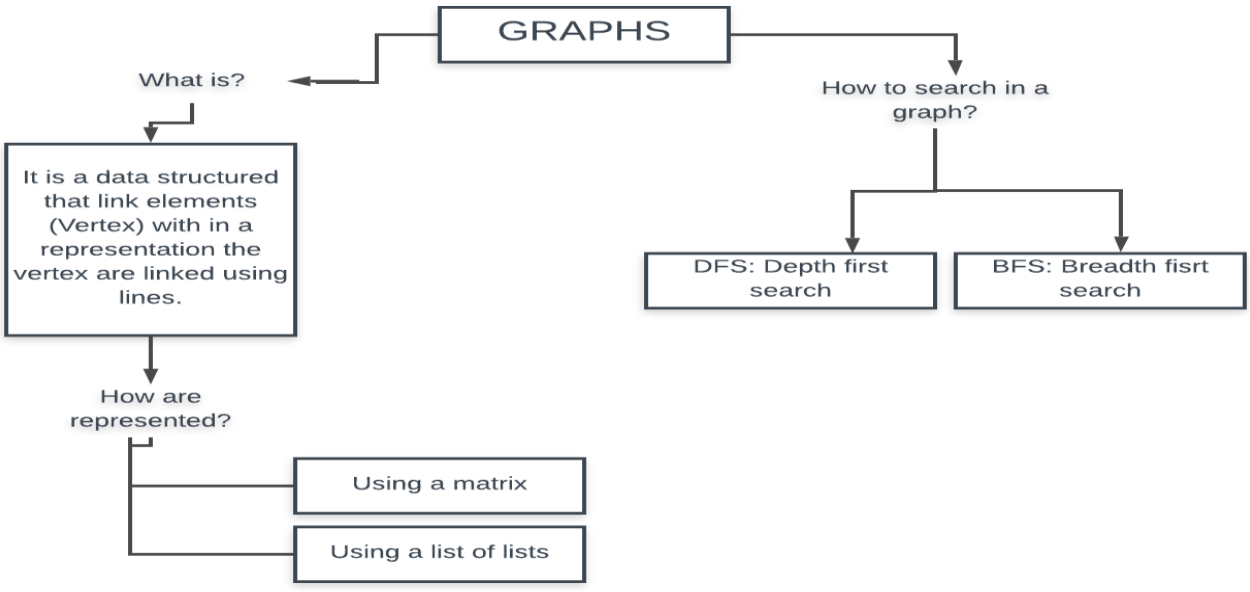
	0	1	2	3	4	5	6	7
0				1	1			
1	1		1			1		
2		1			1		1	
3								1
4			1					
5								
6			1					
7								

4.2

0 -> [3, 4]
1 -> [0, 2, 5]
2 -> [1, 4, 6]
3 -> [7]
4 -> [2]
5 -> []
6 -> [2]
7 -> []

4.3 Option b)
4.4.1 Option ii)
4.4.2 Option i)

5) Recommended reading



PhD. Mauricio Toro Bermúdez
Professor | School of Engineering | Informatics and Systems
Email: mtorobe@eafit.edu.co | Office: Building 19 – 627
Phone: (+57) (4) 261 95 00 Ext. 9473