Laboratory practice 5: Graphs

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1) Project questions Simulation

1.a. Write an explanation between 3 and 6 lines of the code of number 1.1. How it works, how the graph is implemented with matrices and the lists you made, highlighting the data structures and algorithms used

In the implemented method with matrices we established a value one (1) for those graphs that were connected and zero (0) for those that did not and all the information was taken from this matrix. For the case with lists we created an array list in which for each position of this (that indicated a vertex) it was assigned a linked list with the vertex-value pairs of each of the graphs attached to it.

1.b. To represent the map of the city of Medellín from the exercise of number 1.3, what is better to use, Adjacency Matrices or Adjacency Lists? Why?

For the exercise of graphs in the city it is advisable to use the adjacent lists since they only keep the information of those graphs that are connected and not all as it would be with the implementation of adjacent matrices. With this structure, memory would be saved although at the time of execution a very similar performance is had.

1.c. what is better to use, Adjacency Matrices or Adjacency Lists? Why?

It is better to use adjacent lists as it saves memory and allows adding or removing elements without problems, which can not be done efficiently with adjacent matrices.

1.d. what is better to use, Adjacency Matrices or Adjacency Lists? Why?

If you want to save memory it is better to use the adjacency lists but at the time of execution, find the route from the starting point to the end point. The procedures must be the same since in each case the connections between nodes must be analyzed, see the connections of these new nodes with others.

2) Midterm Simulation

2.a. Exercise 1

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

2.b. Exercise 2

- 0 -> [3,4]

- 1 -> [0,2,5]

- 2 -> [4,6]

- 3 -> [7]

- 4 -> [2]

- 5 -> [ ]

- 6 -> [2]

- 7 -> [ ]

2.c. Exercise 3

2.3.1   How much memory (not time but memory) occupies a representation using adjacency lists for the worst graph directed with n vertices?
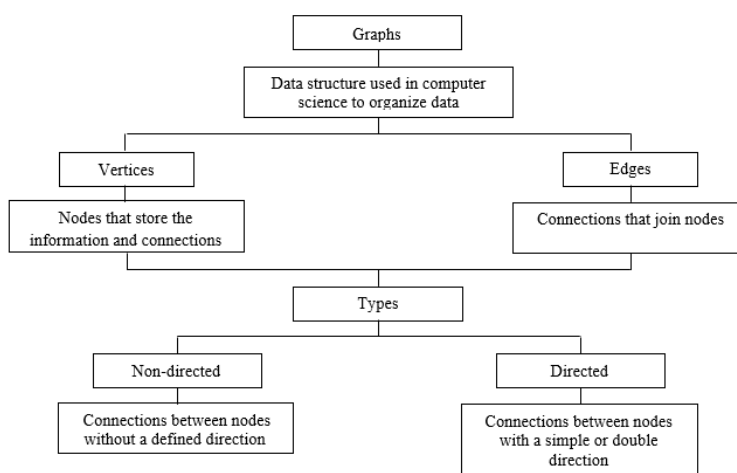
b) O(n^2)

3) Recommended reading

3.a. Summary

The graphs are a data structure very used in the organization of information and is also very used in computer science to analyze routes and connections. To be implemented, certain nodes (vertices) are used, which are connected to others due to edges which represent the interaction with other elements. There are two types of graphs, the directed graph and the non-directed graph, the first type is the graph whose edges have a defined direction, it shows a specific path of access form one graph to another, and on the other hand, the non -directed graphs are those whose nodes are connected but they do not have a defined path (order)

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3.b. Chart

4) Team work and progress

4.a. Meetings

Team work (meetings)		
Date	time	Description
17.10.18	1 hour	work distribution
20.10.18		construction of the report part 1
22.10.18	3 hours	construction of the report part 2

4.b. History of changes in the code

History of changes in the code		
version	includes	status
1.0	Adjacency matrices and adjacency list	unfinished
	Greatest successor problem	
2.0	Adjacency matrices and adjacency list	finished
	Greatest successor problem	
	Colorable or not colorable problem	

4.c. History of changes in the report

History of changes in the report		
version	**includes**	**status**
	project questions simulation (3.1- 3.2 -3.3 -3.4)	
	midterm simulation	
1.0	recomended reading	unfinished
	project questions simulation finished	
	midterm simulation	
	recomended reading	
2.0	Team work and gradual process	finished

4.d. Team Work

Member	part of the laboratory	Description
		1.1 Adjacency matrices and adjacency list
	1	1.2 Greatest successor problem
		3.1 Bow 1.1 excercise work
		3.2 Medellin city map- best structure
		3.3 Best structure in general cases
	3	3.4 Routing table- best structure
	5	Recommended reading
Hamilton	6	Team work and gradual process
	2	Colorable or not colorable problem
		3.5 2.1 Exercise completity
	3	3.6 Meaning of 'n' and 'm' in the complexity
	4	Midterm simulation
	6	Team work and gradual process
Santiago	7	Translate lab

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Team work