ESTRUCTURA DE DATOS 1
Código ST0245

Laboratory practice No. 5: Graphs

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3) Practice for final project defense presentation

3.2 An adjacency matrix has a space complexity of $O(n^2)$, with n as the number of vertices. Representing 300,000 vertices would occupy a space of 9_{x10}^{10}.

3.3

3.4 For this problem we used a matrix, an adjacency matrix, and linked lists. An algorithm was used to determine if the graph was bipartite or not. A bipartite graph is a graph which vertices can be separated into two disjoint groups; this means that the intersection between these two groups will be the empty set. If the graph resulted to be bipartite, each edge would connect two vertices that belong to different groups. Therefore, if we divide the vertices into two groups with different colors and the graph is bipartite, we will be able to paint the graph in such a way that no vertex will be connected to another vertex of the same color.

The code starts by reading the data and creating an adjacency matrix which consists of 1s and 0s where the 1s represent an existing edge between two vertices and the 0s represent no connection. Then, the root is colored in blue and the rest of the vertices are colored in a for loop where it is evaluated if the graph indeed can be filled with just two colors without having two vertices of the same color connected by an edge.

3.5 $O(n*m + ñ^2)$

3.6 n is the length of listaInstrucciones, m is the number of edges, and ñ is the number of nodes.

4) Practice for midterms

4.1 .

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

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4		1						
5								
6		1						
7								

    4.2 1->[0,2,5]
        2->[1,4,6]
        3->[7]
        4->[2]
        5->[ ]
        6->[2]
        7->[ ]
    4.3 $O(n^2)$
    4.4 1. No está la respuesta dentro de las opciones. La respuesta correcta es [1,5,2,3,4,0]
        2. i

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