Laboratory practice No. 1

Luis Bernardo Zuluaga
Universidad Eafit
Medellín, Colombia
lbzuluagag@eafit.edu.co

Manuela Zapata
Universidad Eafit
Medellín, Colombia
mzapatag1@eafit.edu.co

Bosse Bandowski
Universidad Eafit
Medellín, Colombia
bbandowsk@eafit.edu.co

3) Practice for final project defense presentation

1. The digraph with matrices is a normal matrix of integers whose positions [x][y] indicate where the link between nodes starts and how far it goes, the value in each position indicates the weight of the relation. On the other hand, the digraph with lists is made of a LinkedList in LinkedList, and inner LinkedList has pairs in it, which are integers.
2. When the digraph has dispersed data, it has many separate nodes and few links between them, it is better to use a list since in a matrix there is a lot of unused space. On the other hand, if the data is not dispersed it is better to work with a matrix..
3. Adjacency lists, because if there are many nodes a lot of memory space will be wasted (when using a matrix whose storage requires n^2).
4. Matrix, since it is faster to see each node's links in a matrix. It is simply asking if a node is related to another node in a matrix. The complexity using a matrix is $O(1)$ while in a list it would be $O(n)$.
5. List, because either way it has to look for the shortest route, it has to check which routes it has.
6. Because there are very few links.

4) Practice for midterms

1)

	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								

2)
0->[3,4]
1->[0,5,2]
2->[4,6]
3->[7]
4->[2]
5->[]
6->[2]
7->[]
3) $O(n^2)$ the worst case is when all the nodes are related to eachother