ESTRUCTURA DE DATOS 1
Código ST0245

Laboratory practice No. 5: Graphs implementation

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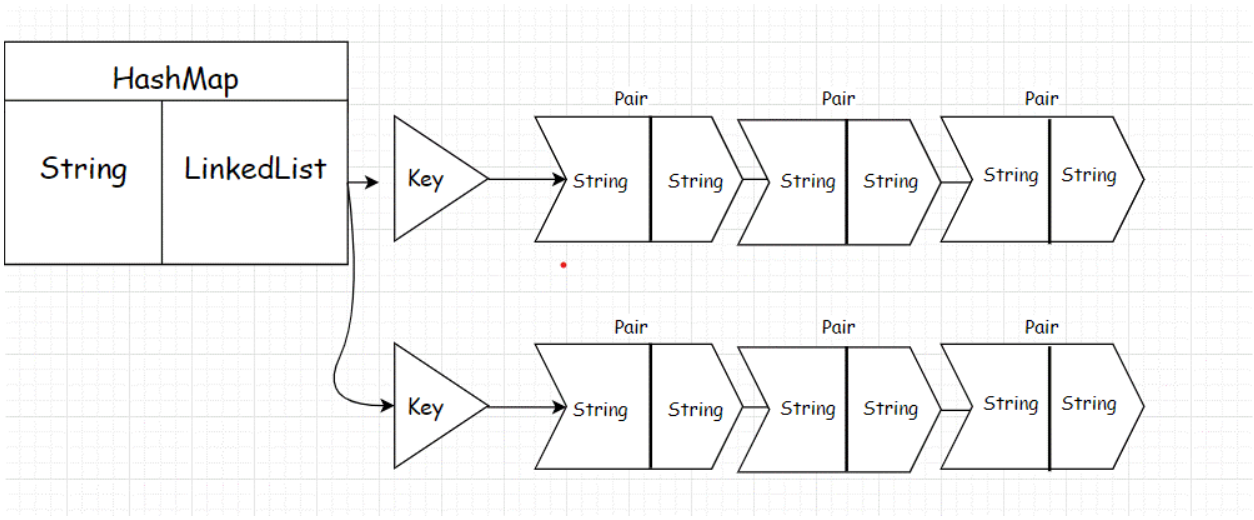
3)

3.1

The data structure consists in a HashMap with a String as a key and a LinkedList Pair class. We use String as a key because the integers that we are going to read are very large to the integer class (We could use big integer, but for simplicity we are going to work with String) and a LinkedList Pair to store the weight and the destination of the values that are going to be added. A class is the data structure (it integrates the methods to represent the ID and the way in which these datas is stored) and the other reads and stores the files.

Data estructure



3.2

Approximately 90.000.000.000. Ninety gigabytes.

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3.3
we use a HashMap for the ID of each site. They are a key, so there is no problem when we are assigning the values.

3.4
3.6
In the point 2.1 we use the graph, matrix and a LinkedList, first we fill the graph of nxn nodes, and we ask the origin and destination that the graph in the position ixj, this will be colored or not, then we use. To access this position, you need to know the position i (origin), j (destination), and then you will know the weight. The LinkedList saves the information of the graph, but in each position in the list, it saves the pairs (vertex and weight).

To know the weight, you need to look the position of the list that have the same source and then see in the list to find the destination node and the weight that it has.

3.5
The algorithm has a complexity of O(n^2). Where n is the number of nodes that the graph has.

4)

4.1 Table:

	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]

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5->[]

6->[2]

7->[]

4.3 *D*

b) O(n2)

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