

Laboratory practice No. 3: LinkedList and ArrayList

Miguel Ángel Correa Manrique

Universidad Eafit
Medellín, Colombia
macorream@eafit.edu.co

Pablo Buitrago Jaramillo

Universidad Eafit
Medellín, Colombia
pbuitragoj@eafit.edu.co

3) Practice for final project defense presentation

3.1

	ArrayList	LinkedList
Exercise 1.1 (Request One)	$O(n \log K)$	$O(n \log K + m)$
Exercise 1.1 (Reques Two)	$O(n + \log K)$	$O(n + m + \log K)$
Exercise 1.1 (InsertDataStudent Method)	$O(\log K)$	$O(m + \log K)$

n : Represents the query, the time required to show each data, because it is necessary to iterate over the STL Map.

log K : Represents the time required to access a value on STL Map with K size, referring to the Map that was accessed.

m: Represents the amount to search the semester on the LinkedList.

In the ArrayList version, it is proposed an ArrayList with size p, where $p > k$, such that k represents a big number that has to be defined, meaning that each semester will be accessible by its number on the ArrayList, this will allow the access in constant time to the semester that contain the STL's Maps.

3.2 Once taken the string a for each will iterate over it, we are going to insert again every element on some new char list 'listChar' except for '[' & ']', these will establish the rules, when a '[' is

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

ESTRUCTURA DE DATOS 1
Código ST0245

found the program will start to write at the beginning of 'listChar', and if a ']' the program will start to write at the end of 'listChar', accessing each point with listChar.begin() and listChar.end() iterators for each function respectively.

3.3

Time Complexity	
Exercise 2.1	O(n)

Note that is O(n) because the iterator is already obtained once that is detected a '[', also it is remarkable to say that STL list is double link listed.

3.4 n : represents string length.

4) Practice for midterms

4.1 a

4.2 c

4.3 a. q.size() > 1

b. <

c. q.add(q.remove());

d. q.remove();

4.4 a. lista.size()

b. lista.addFirst(auxiliar.peek());

auxiliar.pop();

4.5

4.5.a auxiliar1.size() > 0 auxiliar2.size() > 0

4.5.b personas.offer(edad);

4.6 a

4.8 c

4.8.1 a

4.8.2 c

4.8.3 c

4.9

4.9.1 d

4.9.2 a

4.9.3 b

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

ESTRUCTURA DE DATOS 1

Código ST0245

4.10

4.10.1 a

4.10.2 b

4.11

4.11.1 $s1.size() > 1$ 4.11.2 $s2.push(s1.pop());$ 4.11.3 $return s1.pop();$

4.12

4.12.1 iv

4.12.2 i

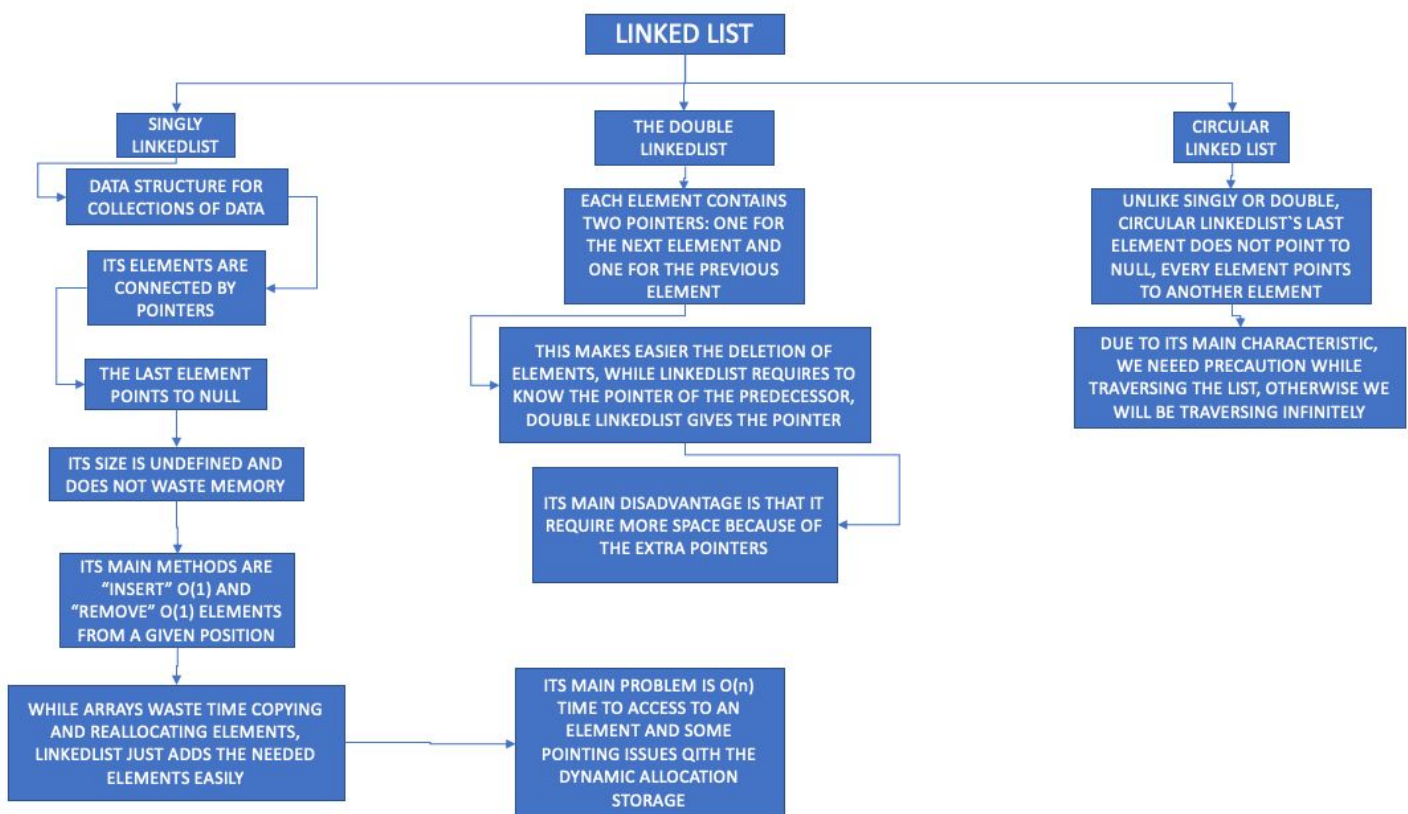
4.13

4.13.1 iii

4.13.2 iii

4.14 iii

5) Recommended reading (optional)



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

ESTRUCTURA DE DATOS 1
Código ST0245

6) Team work and gradual progress (optional)

6.1 Meeting minutes

Member	Date	Done	Doing	To do
Miguel	2019/09/05		Exercise 2.2 on C++. Exercise 2.1 on C++.	Worksheet 1,2,3,6.
Miguel	2019/09/08	Exercise 2.1 on C++ Exercise 2.2 on C++	Worksheet point 1.	Worksheet points 1, 3, 6.
Miguel	2019/09/08	Exercise 1.1 on C++		Worksheet point 6.
Pablo	2019/09/10			Worksheet points 4, 5.
Pablo Miguel	2019/09/10		Worksheet point 4.	
Miguel	2019/09/14		Optional points worksheet point 2.	Worksheet point 3, 6.
Miguel	2019/09/14	Optional worksheet point 2.		Worksheet point 3, 6. Read CSV file and use queries.
Miguel	2019/09/15	Read CSV file	Worksheet	Worksheet

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

ESTRUCTURA DE DATOS 1

Código ST0245

		and use queries.	point 3.	point 3, 6.
Pablo	2019/09/15	Worksheet point 4.	Worksheet point 5.	
Miguel	2019/09/15	Worksheet point 3.	Worksheet point 6.	
Pablo	2019/09/15	Worksheet point 5.		
Miguel	2019/05/15	Worksheet point 6.		

6.2 History of changes of the code

* **commit c02fe2ebe6fa1864a94538d926984accf872d93f (HEAD -> master, origin/master, origin/HEAD)**

| Author: miguelmqe <macorream@eafit.edu.co>

| Date: Sun Sep 15 22:45:43 2019 -0500

| documented}

* **commit 5dac28e5ddd8440f54b66e4541cf9d8e8f3f1740**

| Author: miguelmqe <macorream@eafit.edu.co>

| Date: Sun Sep 15 22:13:15 2019 -0500

| a lot of files finished

* **commit 4af2f28d347bae58ff96082dcadaa8cdd08e48ba**

| Author: miguelmqe <macorream@eafit.edu.co>

| Date: Sun Sep 15 11:39:15 2019 -0500

| problem version v2, now better with piles

* **commit 663bb2dcf10d8e8f353aafb151f483b9a57d4a58**

| Author: miguelmqe <macorream@eafit.edu.co>

| Date: Sun Sep 8 23:24:15 2019 -0500

| point 1 solved

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

ESTRUCTURA DE DATOS 1
Código ST0245

* **commit 3aa41d03465ea14956d17051cfd3afe4a52c751e**

| Author: miguelmqe <macorream@eafit.edu.co>

| Date: Sun Sep 8 19:39:01 2019 -0500

| point2_1 solved, correction to segmentation fault

* **commit 1b417bcf5f064dfb9468cdd644ae783f2aa5fbdb**

| Author: miguelmqe <macorream@eafit.edu.co>

| Date: Sun Sep 8 19:14:26 2019 -0500

| point 2_2 solved, useless methods removed

* **commit ae390cb80e53454a35586419aa86e814a73ba101**

| Author: miguelmqe <macorream@eafit.edu.co>

| Date: Sun Sep 8 19:05:56 2019 -0500

| point 2_2 solved

* **commit 65d6cfd77b05a5577937a523575a44d260bfd141**

| Author: miguelmqe <macorream@eafit.edu.co>

| Date: Sun Sep 8 17:00:43 2019 -0500

| moveOnto successful

* **commit 35213da5c7d89b7e54cf41e781eeda6d4e5b3198**

| Author: miguelmqe <macorream@eafit.edu.co>

| Date: Sun Sep 8 19:14:26 2019 -0500

| point 2_2 solved, useless methods removed

* **commit ae390cb80e53454a35586419aa86e814a73ba101**

| Author: miguelmqe <macorream@eafit.edu.co>

| Date: Sun Sep 8 19:05:56 2019 -0500

| point 2_2 solved

* **commit 65d6cfd77b05a5577937a523575a44d260bfd141**

| Author: miguelmqe <macorream@eafit.edu.co>

| Date: Sun Sep 8 17:00:43 2019 -0500

| moveOnto successful

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

ESTRUCTURA DE DATOS 1
Código ST0245

* commit 35213da5c7d89b7e54cf41e781eeda6d4e5b3198
| Author: miguelmque <macorream@eafit.edu.co>
| Date: Thu Sep 5 12:16:34 2019 -0500

| advanced on point2_2

* commit 5a6cbd7f3bcf9260da8cb82eed789fba4480d5f1
| Author: miguelmque <macorream@eafit.edu.co>
| Date: Thu Sep 5 01:20:03 2019 -0500

| point 2_1 solved c++

6.3 History of changes of the report

<div><div><div><div><div></div><div>miguel mque</div></div></div><div><div>September 10, 11:46 AM</div><div><div></div><div>Miguel Mque</div></div></div><div><div>September 10, 11:36 AM</div><div><div></div><div>Miguel Mque</div></div></div><div><div>September 10, 11:36 AM</div><div><div></div><div>Miguel Mque</div></div></div><div><div>September 10, 11:34 AM</div><div><div></div><div>Miguel Mque</div></div></div><div><div>September 10, 11:32 AM</div><div><div></div><div>Miguel Mque</div></div></div></div></div>	<div><div><div><div></div><div>Pablo Buitrago</div></div></div><div><div>September 15, 4:34 PM</div><div><div></div><div>Pablo Buitrago</div></div></div><div><div>September 15, 4:33 PM</div><div><div></div><div>Pablo Buitrago</div></div></div><div><div>September 15, 4:18 PM</div><div><div></div><div>Pablo Buitrago</div></div></div><div><div>September 15, 4:17 PM</div><div><div></div><div>Pablo Buitrago</div></div></div><div><div>September 15, 4:17 PM</div><div><div></div><div>Pablo Buitrago</div></div></div><div><div>September 15, 4:16 PM</div><div><div></div><div>Pablo Buitrago</div></div></div></div>
AST WEEK	
<div><div><div><div></div><div>September 8, 7:43 PM</div></div></div><div><div><div></div><div>Miguel Mque</div></div></div><div><div>September 8, 7:42 PM</div><div><div></div><div>Miguel Mque</div></div></div></div>	TUESDAY
	<div><div><div><div></div><div>September 10, 11:50 AM</div></div></div><div><div><div></div><div>Miguel Mque</div></div></div></div>

ESTRUCTURA DE DATOS 1

Código ST0245

● Pablo Buitrago	September 15, 6:00 PM
September 15, 4:34 PM	● Miguel Mque
● Pablo Buitrago	September 15, 6:00 PM
September 15, 4:33 PM	● Miguel Mque
● Pablo Buitrago	September 15, 5:57 PM
September 15, 4:18 PM	● Miguel Mque
● Pablo Buitrago	September 15, 5:55 PM
September 15, 4:17 PM	● Miguel Mque
● Pablo Buitrago	September 15, 5:48 PM
September 15, 4:17 PM	● Pablo Buitrago
● Pablo Buitrago	September 15, 5:44 PM
September 15, 4:16 PM	● Pablo Buitrago
● Pablo Buitrago	September 15, 4:35 PM
TUESDAY	● Pablo Buitrago
▼ September 10, 11:50 AM	September 15, 4:34 PM
● Miguel Mque	● Pablo Buitrago

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

ESTRUCTURA DE DATOS 1
Código ST0245

September 15, 6:07 PM ● Miguel Mque	September 15, 6:40 PM ● Miguel Mque
September 15, 6:06 PM ● Miguel Mque	September 15, 6:40 PM ● Miguel Mque
September 15, 6:05 PM ● Miguel Mque	September 15, 6:40 PM ● Miguel Mque
September 15, 6:04 PM ● Miguel Mque	September 15, 6:38 PM ● Miguel Mque
September 15, 6:03 PM ● Miguel Mque	September 15, 6:36 PM ● Miguel Mque
September 15, 6:03 PM ● Miguel Mque	September 15, 6:35 PM ● Miguel Mque
September 15, 6:02 PM ● Miguel Mque	September 15, 6:32 PM ● Miguel Mque
September 15, 6:01 PM ● Miguel Mque	September 15, 6:31 PM ● Miguel Mque

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

ESTRUCTURA DE DATOS 1

Código ST0245

● Miguel Mque	September 15, 7:38 PM
September 15, 7:04 PM	● Pablo Buitrago
● Miguel Mque	September 15, 7:36 PM
September 15, 7:04 PM	● Pablo Buitrago
● Miguel Mque	September 15, 7:35 PM
September 15, 7:02 PM	● Pablo Buitrago
● Pablo Buitrago	September 15, 7:34 PM
● Miguel Mque	● Pablo Buitrago
September 15, 7:00 PM	September 15, 7:32 PM
● Pablo Buitrago	● Pablo Buitrago
September 15, 6:48 PM	September 15, 7:31 PM
● Miguel Mque	● Pablo Buitrago
September 15, 6:47 PM	September 15, 7:30 PM
● Miguel Mque	● Pablo Buitrago
● Pablo Buitrago	September 15, 7:28 PM
September 15, 6:45 PM	● Pablo Buitrago
● Miguel Mque	

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

ESTRUCTURA DE DATOS 1

Código ST0245

September 15, 8:21 PM	● Pablo Buitrago
● Miguel Mque	September 15, 9:04 PM
September 15, 8:20 PM	● Pablo Buitrago
● Miguel Mque	● Miguel Mque
September 15, 8:19 PM	September 15, 9:01 PM
● Miguel Mque	● Miguel Mque
September 15, 8:18 PM	September 15, 9:01 PM
● Miguel Mque	● Pablo Buitrago
September 15, 8:17 PM	● Miguel Mque
● Miguel Mque	September 15, 9:00 PM
September 15, 8:14 PM	● Miguel Mque
● Miguel Mque	September 15, 8:59 PM
September 15, 8:14 PM	● Pablo Buitrago
● Miguel Mque	September 15, 8:57 PM
September 15, 8:13 PM	● Pablo Buitrago
● Miguel Mque	September 15, 8:57 PM
	● Miguel Mque

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

ESTRUCTURA DE DATOS 1

Código ST0245

September 15, 10:11 PM
● Pablo Buitrago
September 15, 10:09 PM
● Pablo Buitrago
September 15, 10:08 PM
● Pablo Buitrago
September 15, 9:42 PM
● Miguel Mque
September 15, 9:33 PM
● Miguel Mque
September 15, 9:33 PM
● Miguel Mque
September 15, 9:19 PM
● Miguel Mque
September 15, 9:18 PM
● Miguel Mque

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