

TITLE (A SHORT DESCRIPTION OF THE PROJECT, BETWEEN 8 AND 12 WORDS)

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NOTE: To have more information about the sections in this report, please read “Guía para la realización del Proyecto Final de Estructura de Datos 1.” For the final version of this report: 1. Delete all text in red. 2. Adjust spaces among words and paragraphs. 3. Change the color of all the texts to black. You should also keep in mind the meaning of the colors:

Black text = To complete for the 1st deliverable

Blue text = To complete for the 2nd deliverable

Violet text = To complete for the 3rd deliverable

ABSTRACT

To write the abstract, you should answer the following questions in a paragraph: What is the problem? Why is the problem important? Which are the related problems? **What is the solution you proposed?, what results did you achieve?** , What are the conclusions of this work? Abstract should have at most 200 words.

Keywords

Keywords that you consider meaningful to index this report in libraries and data bases.

ACM CLASSIFICATION Keywords

Only keywords in the ACM classification which can be found at <http://bit.ly/2oVE5 2i>

You cannot create your own keywords here.

Example: Theory of computation → Design and analysis of algorithms → Graph algorithms analysis → Shortest paths

1. INTRODUCTION

Is the motivation in the real world that leads to the problem. This means, include some history of this problem.

2. PROBLEM

In a few words, explain the problem, the impact that has in society and why is important to solve the problem.

3. RELATED WORK

Explain 4 algorithmic problems related to the problem described in Section 2. You may find the related problems in book, scientific articles or websites. You should explain at least one solution for each problem. DO NOT include technological solutions, focus on algorithmic problems and algorithmic solutions.

3.1 Title of the first related problem

You should mention the first algorithmic problem and its solution.

3.2 Title of the second related problem

You should mention the second algorithmic problem and its solution.

3.3 Title of the third related problem

You should mention the third algorithmic problem and its solution.

3.4 Title of the fourth related problem

You should mention the fourth algorithmic problem and its solution.

4. Title of the first data structure designed

Design a data structure to solve the problem and make a figure explaining it. Do not use figures from the Internet.



Figure 1: Linked List of persons. Una person is a class that contains a name, id number and photo.

4.1 Operations of the data structure

Design the operation of the data structure to solve the problem efficiently. Include one figure to explain each operation.

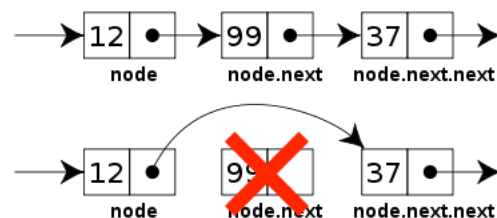


Figure 2: Delete operation of a Linked List.

4.2 Design criteria of the data structure

Explain objective criteria that you considered to design the data structure. Examples of objective criteria are efficiency in time and space. Non-objective criteria will lower your grade. Examples of non-objective criteria are: “I was sick”, “it was the first data structure that I found on the Internet”, “I did it on the last day before deadline”, etc. Remember: This is 40% of the project grade.

4.3 Complexity analysis

Derive the complexity of each operation of the data structure for the worst case and best case, As an example, this is a way to report the complexity analysis:

Método	Complejidad
Busqueda Fonética	O(1)
Imprimir búsqueda fonética	O(m)
Insertar palabra búsqueda fonética	O(1)
Busqueda autocompletado	O(s + t)
Insertar palabra en TrieHash	O(s)
Añadir búsqueda	O(s)

Table 1:

Table to report complexity analysis

4.4 Execution time

Measure (I) execution time and (II) memory used by the operations of the data structure, for the data set found in the .ZIP file.

Measure the execution time and memory used 100 for each data set and for each operation of the data structure. Report the average values.

	Conjunto de Datos 1	Conjunto de Datos 2	...Conjunto de Datos n
Creación	10 sg	20 sg	5 sg
Operación 1	12 sg	10 sg	35 sg
Operación 2	15 sg	21 sg	35 sg
Operación n	12 sg	24 sg	35 sg

Table 2: Execution time of the operations of the data structure for each data set.

4.5 Memory used

Report the memory used for each data set

	Conjunto de Datos 1	Conjunto de Datos 2	...Conjunto de Datos n
Consumo de memoria	10 MB	20 MB	5 MB

Table 3: Memory used for each operation of the data structure and for each data set data sets.

4.6 Result analysis Explain the result s

Tabla de valores durante la ejecución			
Estructuras de autocompletado	LinkedList	Arrays	HashMap
Espacio en el Heap	60MB	175MB	384MB
Tiempo creación	1.16 - 1.34 s	0.82 - 1.1 s	2.23 - 2.6 s
Tiempo búsqueda ("a")	0.31 - 0.39 s	0.37 - 0.7 s	0.22 - 0.28 s
Tiempo búsqueda ("zyzzyvas")	0.088 ms	0.038 ms	0.06 ms
Búsqueda			

obtained. As an example, compare different implementation of the data structure and report the comparison in a table or graph.

Table 4: Analysis of the results

5. Title of the last data structure designed

Design a data structure to solve the problem and make a figure explaining it. Do not use figures from the Internet.



Figure 1: Linked List of persons. Una person is a class that contains a name, id number and photo.

5.1 Operations of the data structure

Design the operation of the data structure to solve the problem efficiently. Include one figure to explain each operation.

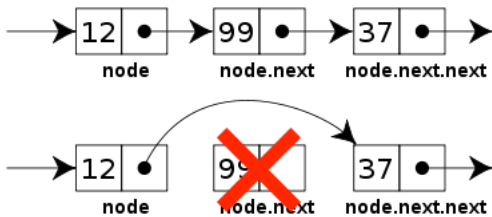


Figure 2: Delete operation of a Linked List.

5.2 Design criteria of the data structure

Explain objective criteria that you considered to design the data structure. Examples of objective criteria are efficiency in time and space. Non-objective criteria will lower your

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5.3 Complexity analysis

Derive the complexity of each operation of the data structure for the worst case and best case, As an example, this is a way to report the complexity analysis:

Método	Complejidad
Búsqueda Fonética	$O(1)$
Imprimir búsqueda fonética	$O(m)$
Insertar palabra búsqueda fonética	$O(1)$
Búsqueda autocompletado	$O(s + t)$
Insertar palabra en TrieHash	$O(s)$
Añadir búsqueda	$O(s)$

Table 5: Table to report complexity analysis

5.4 Execution time

Measure (I) execution time and (II) memory used by the operations of the data structure, for the data set found in the .ZIP file.

Measure the execution time and memory used 100 for each data set and for each operation of the data structure. Report the average values.

	Conjunto de Datos 1	Conjunto de Datos 2	...Conjunto de Datos n
Creación	10 sg	20 sg	5 sg
Operación 1	12 sg	10 sg	35 sg
Operación 2	15 sg	21 sg	35 sg
Operación n	12 sg	24 sg	35 sg

Table 6: Execution time of the operations of the data structure for each data set.

5.5 Memory used

Report the memory used for each data set

	Conjunto de Datos 1	Conjunto de Datos 2	...Conjunto de Datos n
Consumo de memoria	10 MB	20 MB	5 MB

Table 7: Memory used for each operation of the data structure and for each data set data sets.

5.6 Result analysis

Explain the results obtained. As an example, compare different implementation of the data structure and report the comparison in a table or graph.

Tabla de valores durante la ejecución			
Estructuras de autocompletado	LinkedList	Arrays	HashMap
Espacio en el Heap	60MB	175MB	384MB
Tiempo creación	1.16 - 1.34 s	0.82 - 1.1 s	2.23 - 2.6 s
Tiempo búsqueda ("a")	0.31 - 0.39 s	0.37 - 0.7 s	0.22 - 0.28 s
Tiempo búsqueda ("zyzyvas")	0.088 ms	0.038 ms	0.06 ms
Búsqueda ("aerobacteriologically")	0.077 ms	0.041 ms	0.058 ms
Tiempo búsqueda todas las palabras	6.1 - 8.02 s	4.07 - 5.19 s	4.79 - 5.8 s

Table 8: Analysis of the results

6. CONCLUSIONS

To write the conclusions, proceed in the following way. 1. Write a paragraph with a summary, the most important issued of the report. 2. In another paragraph, explain the most important results that you obtained with the last data structure you designed. 3. Compare your first solution with the last solution. 4. At last, explain future work, a future continuation of this project. You can also mention in the conclusions, technical problems that you had during the development of the data structure and its implementation and you solved them.

6.1 Future work

Answer, what would you like to improve in the future? How would you like to improve your data structure and its implementation?

ACKNOWLEDGEMENTS

Identify the kind of acknowledgment you want to write: for a person or for an institution. Consider the following guidelines: 1. Name of teacher is not mentioned because he is an author. 2. You should not mention websites of authors of articles that you have not contacted. 3. You should mention students, teachers from other courses that helped you.

internet ni autores de artículo leídos con quienes no se han contactado. 3. Los nombres que sí van son quienes ayudaron, compañeros del curso o docentes de otros cursos.

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We thank for assistance with [particular technique, methodology] to [Name Surname, position, institution name] for comments that greatly improved the manuscript.

REFERENCES

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As an example, consider this two references:

1. Adobe Acrobat Reader 7, Be sure that the references sections text is Ragged Right, Not Justified. <http://www.adobe.com/products/acrobat/>.

2. Fischer, G. and Nakakoji, K. Amplifying designers' creativity with domainoriented design environments. in Dartnall, T. ed. Artificial Intelligence and Creativity: An Interdisciplinary Approach, Kluwer Academic Publishers, Dordrecht, 1994, 343-364.