TECHNOLOGY AND ALGORITHMS: A SOLUTION TO BEE´S EXTINTION

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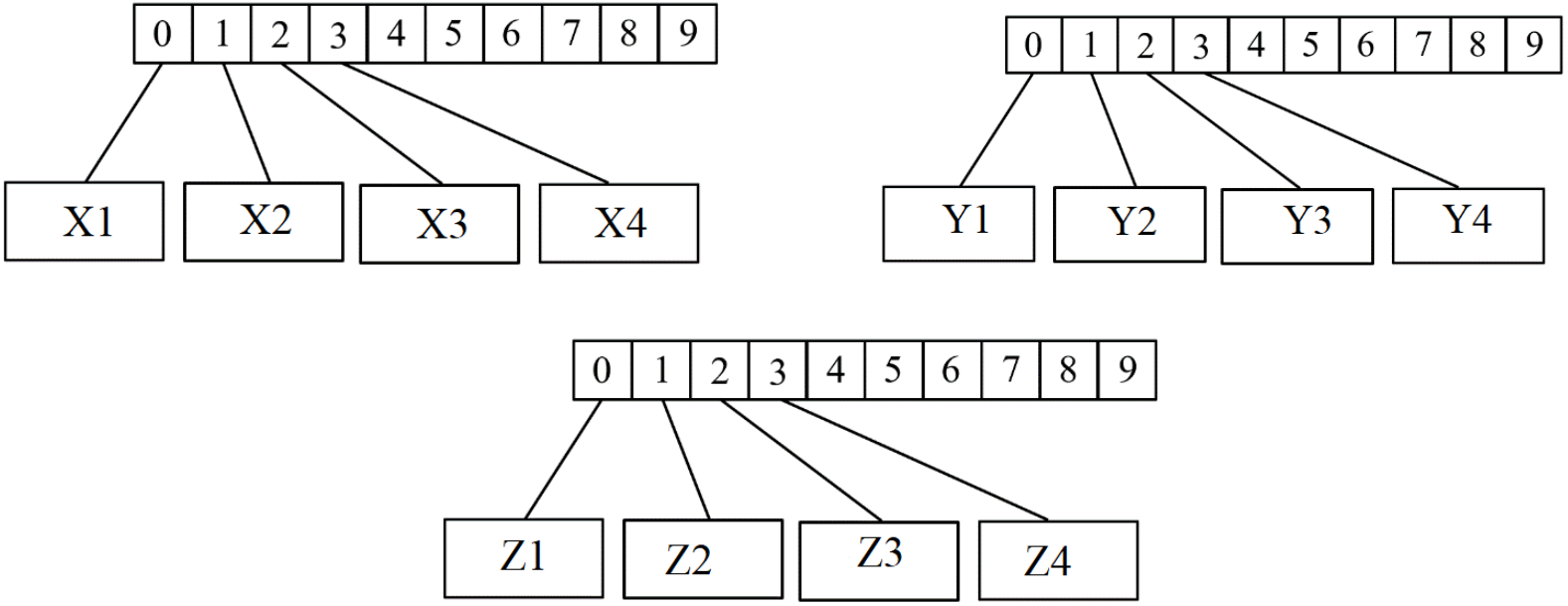
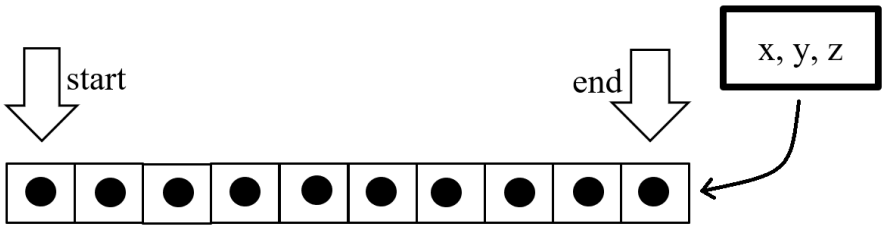
Estructuras de Datos Diseñada



Graphic 1: ArrayList of bee´s coordinates. A coordinate is double number that represent the latitude, longitude or height.

Data Structure Operations

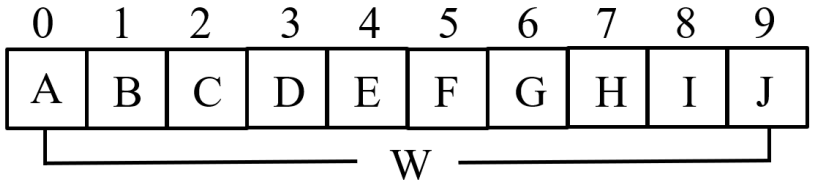


Graphic 2: Add operation of ArrayLists.

Complexity table

Method	Complexity
Add	O(1)
Remove	O(n/2)
Get	O(1)

Table 1: Complexity of the operations of ArrayLists.



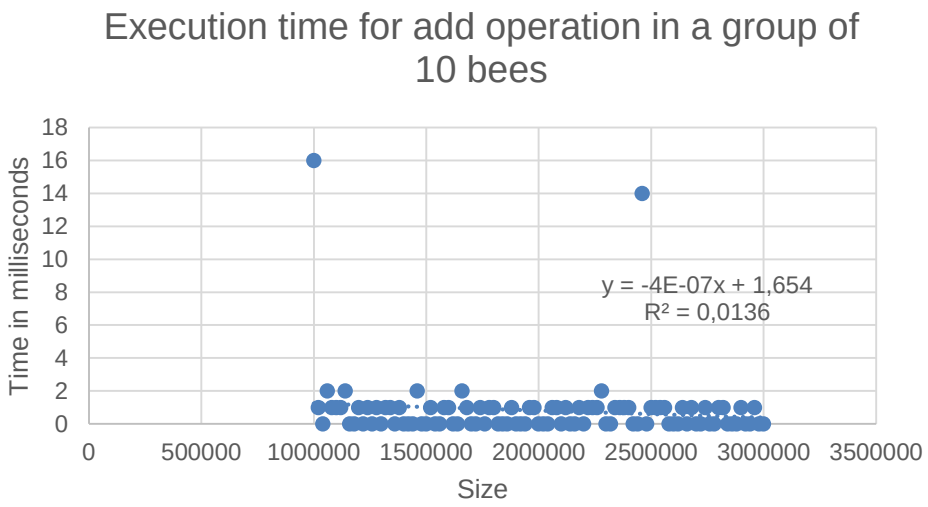
W.get (7) ⟶ A

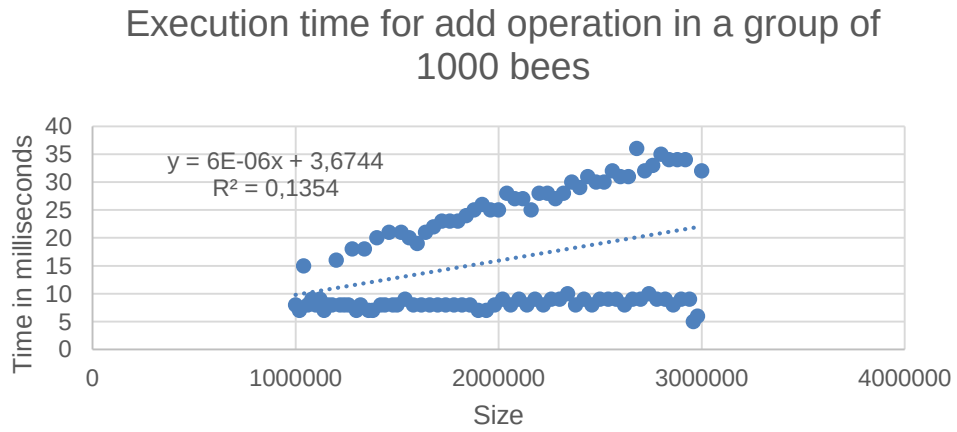
Graphic 3: Get operation of ArrayLists.

Design Criteria of the Data Structure

- To solve the problem it was necessary to test it with groups of data of different sizes, that is to say that this was not a constant factor.
- The data structure used should be one to which you could add many data and obtain each of its specifications (length, latitude, height).
- The add and get operation in an ArrayList have time complexity of O(1), so they were very efficient no matter the size of the data.

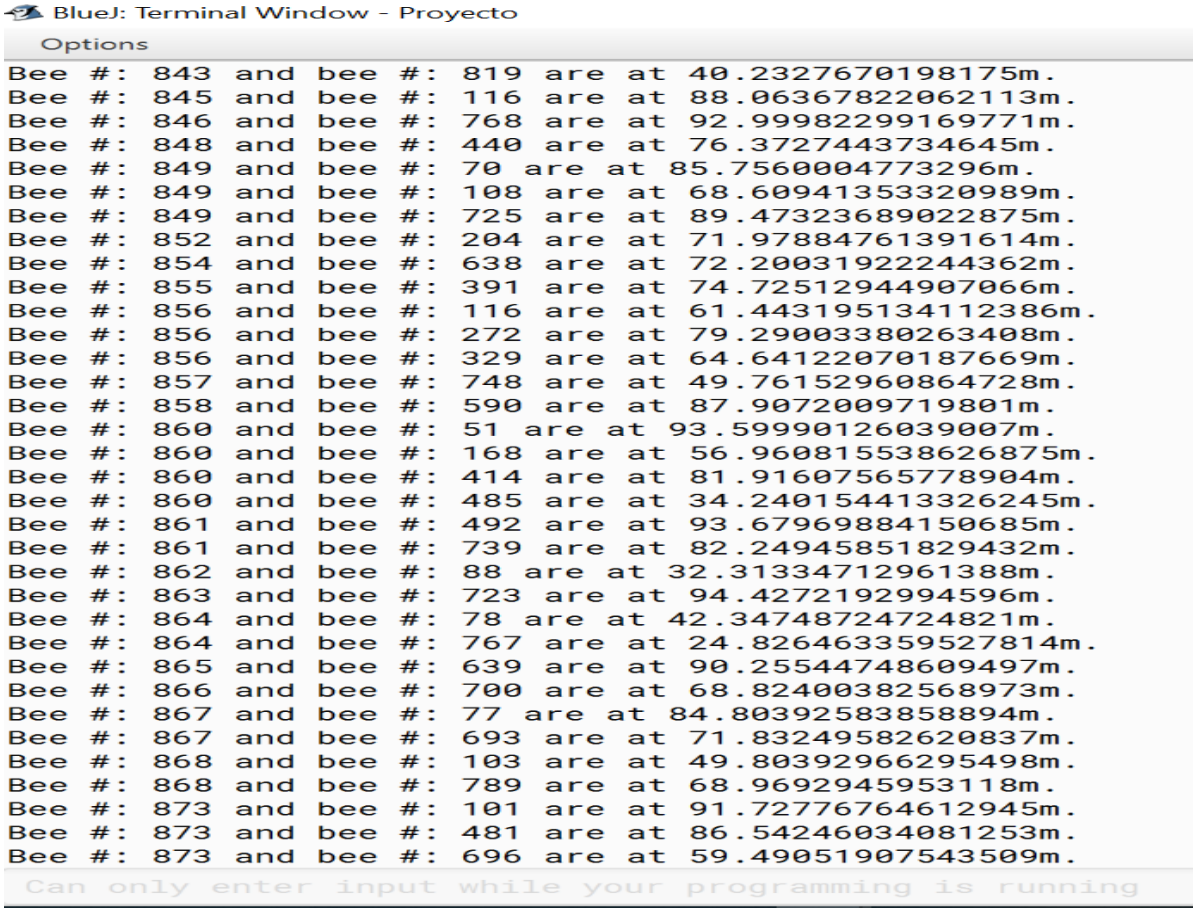
Time and Memory Consumption





Graphic 4, 5: Time execution for add operation in ArrayLists of different lengths.

Implementation



Graphic 5: Bees that are less than 100m.