INTRODUCTION TO COMPLEX SYSTEMS, JAVA, MVN, AND GIT

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Abstract

This document is the solution of a guide that introduces us to use mvn, git and github doing an implementation of linked list, the idea is do a library that can be used with the interface List because we are going to implement two methods: the first is the mean and second is standard deviation.

Contents

1 Introduction

The guide that i develop for this paper has the intention of make a statics calculator. This calculator has two methods, calculate the mean that is used to give the average of a set of n data, and, the standard deviation, is a measure of the spread or dispersion of a set of data, more widely the values are spread out, the larger the standard deviation.

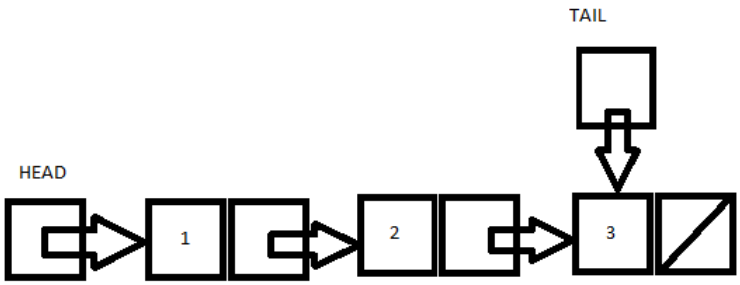
For this version we are going to use an archetype of mvn to create a mvn project. Git and github to store our project versions, also i used java language to implement the LinkedList class, the idea is use the List interface.

2 Linked List

Linked lists are a common abstract data type used to maintain collections of data this are implemented with pointers, for this reason we need knowledge with data structure. A linked list typically has two components.

- head
- tail

Graphically this is how a LinkedtList work.



3 Solution

As we saw before, we need a Node a LinkedList and our calculator class, so this is the class diagram, how i implement List and Iterator i need implement these methods:

- hasNext
- next
- size
- iterator
- add

Finally we need to implement the methods mean and standard deviation.

3.1 Mean

The mean is the average of a set of data.

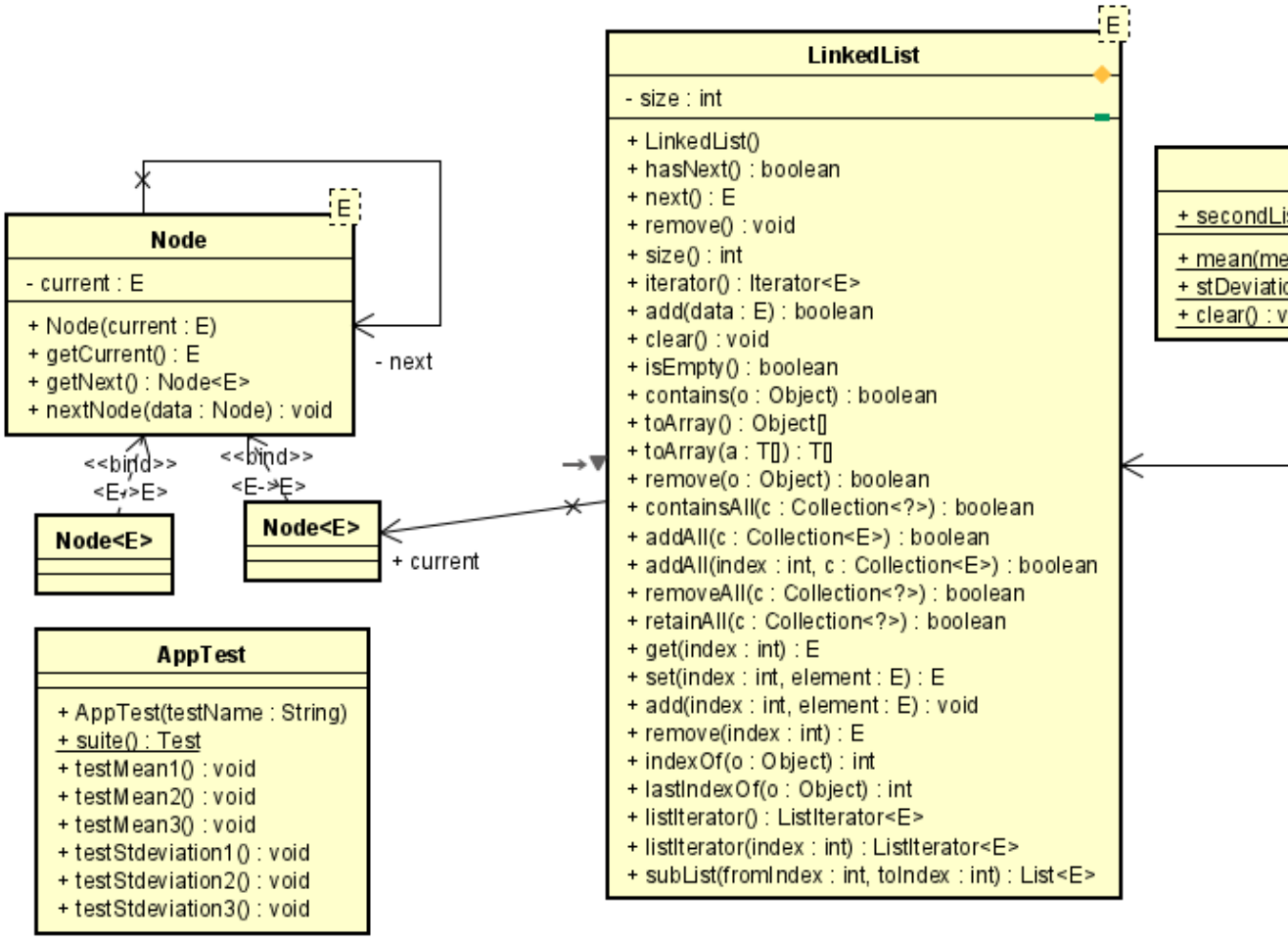
$$x_{avg} = \frac{\sum_{i=1}^{n} x_i}{n}$$

3.2 Standard deviation

Standard deviation is a measure of the spread or dispersion of a set of data. The more widely the values are spread out, the larger the standard deviation.

$$\sigma = \sqrt{\frac{\sum_{i=1}^{n} (x_i - x_{avg})^2}{n-1}}$$

That was the design for this calculator.

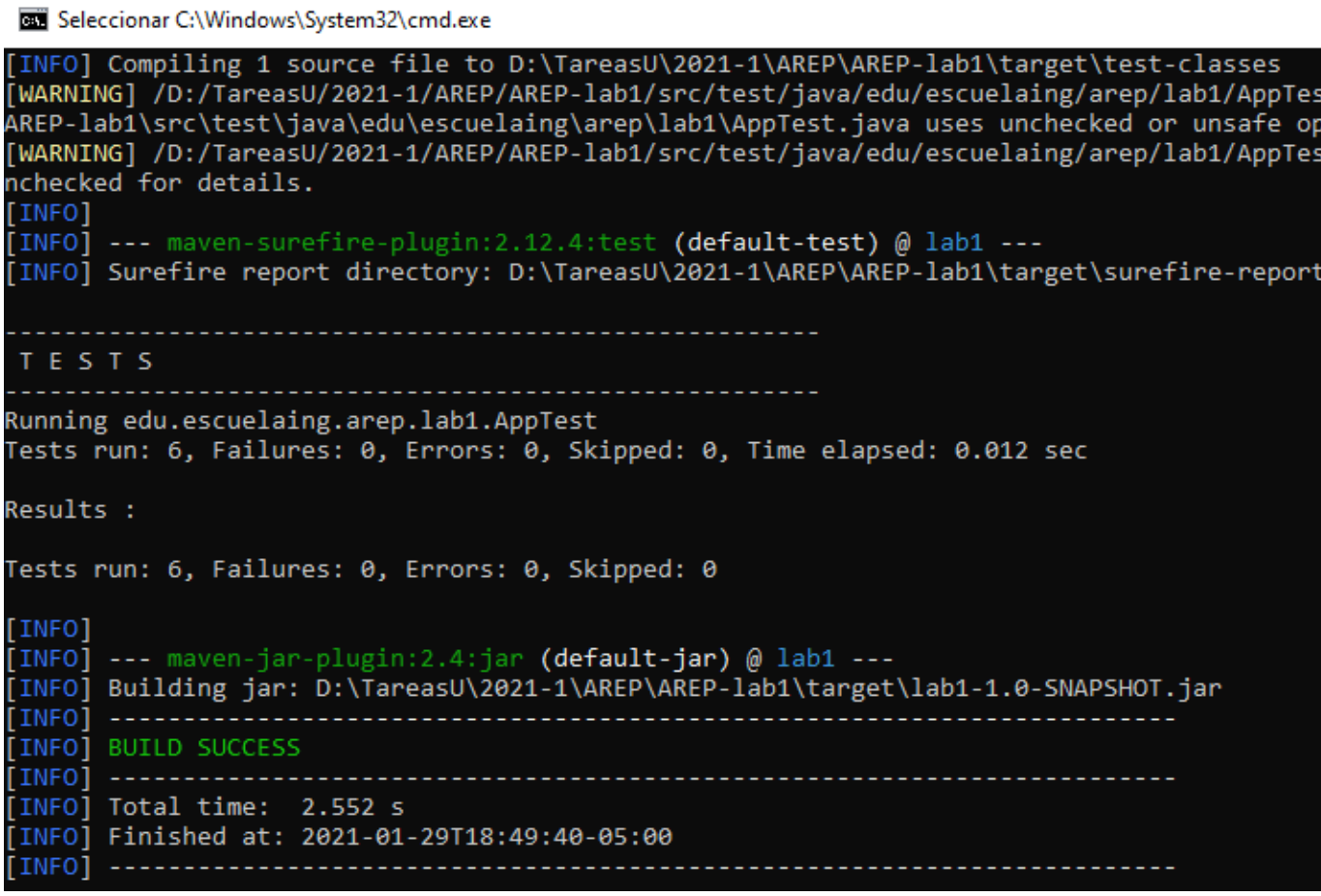


4 Tests

Table 1: Table for test

Header 1
186
699
132
271
291
331
199
1890
188
1601

Finally we can see all the test pass successfully.



5 Conclusion

For this case, we requirement a high level of data structure to implement methods of statistic, also we complete with the minimum requirements to complain successfully this guide. using Java, MVN, Git, Github and finally implementing LinkedList and obtaining this knowledge.

6 References

[1] Benavides, P. L. D. (2020). INTRODUCTION TO COMPLEX SYSTEMS, JAVA, MVN, AND GIT. Arquitectura empresarial, Bogotá, Colombia.

[2] Sebastian Nieto (2020). Tomado de: https://github.com/sebastianNietoMolina/AREP-lab1