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Practical Assessment 2

CSC211 2022

# Linked list report [25 Marks]

# 1. Introduction and Background

The problem that I’m trying to solve is to add different South African citizens to a linked list to be stored and used (displaying, adding, editing…) using java as the programming language. The skills that I would need to use to solve this problem is how to use a linked list to store, delete, add data and I’ll need to use a scanner as a tool to get data from the user that needs to enter different characteristics of a citizen. The different characteristics of the citizen entered will be created using different classes and methods to access and change the way the citizen’s characteristics.

# 2. Implementation

I plan to solve this problem by first creating what a citizen would “look like”. That will happen in the citizen class where the characteristics of this object will be stored (things like the citizenID and citizenName and citizenSurname and other characteristics). There will be getter and setter methods created in the citizen class to pass the objects to other classes where they will be required (class like citizenRegistration so that the user will be able to set a citizen to their liking and enter what characters they would like to add to a citizen or create a citizen from scratch). Important methods in my program would be addCitizenAtHead(Node newNode), addCitizenAtTale(Node newNode), addCitizenBefore(String CitizenID, Node newNode). addCitizenAfter(String CitizenID, Node newNode). The methods are considered important because they give the user the ability to whatever they want with the object. Whether they want to add a new citizen are the head or end, or before or after a specific citizen already in the linked list. For the user to be able to access all these abilities to manipulate the citizen object there will be a menu that will be displayed in the driver method. The menu will the display, in the console menu, a series of numbers explaining what can be done to the citizen object. The menu will display options to display the citizen objects that are currently in the linked list or to add a citizen after a specific citizen with a specific ID number entered by them and many more options. This program will only reuse code if the user enters the same option in the menu provided to them, therefore having to execute the same code to print the desired output for the user.

# 3. Testing

I have tested the program for any problems with code execution. There are a few errors due to me not quite understanding how to solve certain problems within the task although most of the code entered is up to standard with what is required for the user to create and manipulate the citizen object as they please. I have also double checked the problem so that it will be able to handle errors in the user input, whether they have entered an unknown ID number or entered a negative number in the menu, they will be notified if they’ve entered an invalid input for that specific scenario. There were many programming challenges I faced due to that fact that this was my first-time coding used linked lists to store and manipulate objects passed from the user instead of using a normal array. Problems from the fact that I had to do further research on how to add/delete/display a linked list, I ended coming up with the right solutions in certain methods but the rest I had to ask around my colleagues who were also a bit confused as to what to do or approach the problem to come up with a solution.

# 4. Conclusions

As I summarise this report I can safely say that this project has challenged me to my fullest from the different websites I visited to give me an idea to come up with a solution for the different question in the pdf provided to us and to me actually having to think about how I am supposed to approach the different problems in this prac and come up solutions for the many aspects of the practical. The solutions for this project were a combination of the different sites I used and me implementing my own knowledge on what to do.

# 5. References

1) Noriega, L. (2009). Linked Lists and Trees..( <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.539.2014&rep=rep1&type=pdf>)

2) Garrido, J. M. (2009). Linked lists. In *Object Oriented Simulation* (pp. 209-232). Springer, Boston, MA. (<https://link.springer.com/chapter/10.1007/978-1-4419-0516-1_19>)

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