



UNIVERSITY OF CALOOCAN CITY
COMPUTER ENGINEERING DEPARTMENT



Data Structure and Algorithm

Laboratory Activity No. 6

Singly Linked Lists

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I. Objectives

Introduction

A linked list is an organization of a list where each item in the list is in a separate node. Linked lists look like the links in a chain. Each link is attached to the next link by a reference that points to the next link in the chain. When working with a linked list, each link in the chain is called a Node. Each node consists of two pieces of information, an item, which is the data associated with the node, and a link to the next node in the linked list, often called next.

This laboratory activity aims to implement the principles and techniques in:

- Writing algorithms using Linked list
- Writing a python program that will perform the common operations in a singly linked list

II. Methods

- Write a Python program to create a singly linked list of prime numbers less than 20. By iterating through the list, display all the prime numbers, the head, and the tail of the list. (using Google Colab)
- Save your source codes to GitHub

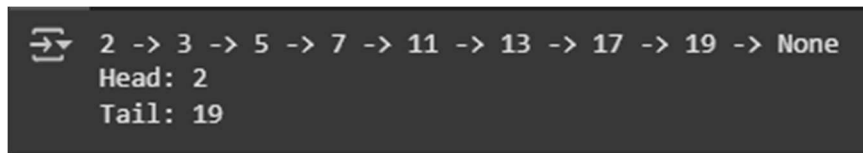
III. Results

Present the visualized procedures done. Also present the results with corresponding data visualizations such as graphs, charts, tables, or image . Please provide insights, commentaries, or explanations regarding the data. If an explanation requires the support of literature such as academic journals, books, magazines, reports, or web articles please cite and reference them using the IEEE format.

Please take note of the styles on the style ribbon as these would serve as the style format of this laboratory report. The body style is Times New Roman size 12, line spacing: 1.5. Body text should be in Justified alignment, while captions should be center-aligned. Images should be readable and include captions. Please refer to the sample below:

Algorithm:

1. Create a Node class with attributes: data and next.
2. Create a LinkedList class with methods to add nodes and display them.
3. Generate prime numbers less than 20.
4. Insert each prime number into the linked list.
5. Traverse the list to display all prime numbers, along with the head and tail.



```
2 -> 3 -> 5 -> 7 -> 11 -> 13 -> 17 -> 19 -> None
Head: 2
Tail: 19
```

Figure 1 Screenshot of program

The program successfully created a singly linked list of prime numbers less than 20 and displayed the head, tail, and traversal results.

IV. Conclusion

This laboratory activity helped in understanding the concepts and applications of singly linked lists. By implementing a linked list of prime numbers less than 20, the process of node creation, traversal, and accessing the head and tail was demonstrated. This strengthened programming skills in Python and understanding of dynamic data structures.

References

[1] Co Arthur O.. “University of Caloocan City Computer Engineering Department Honor Code,” UCC-CpE Departmental Policies, 2020.