UNIVERSITY OF CALOOCAN CITY
COMPUTER ENGINEERING DEPARTMENT

Data Structure and Algorithm

Laboratory Activity No. 6

Singly Linked Lists

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August 23, 2025

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.

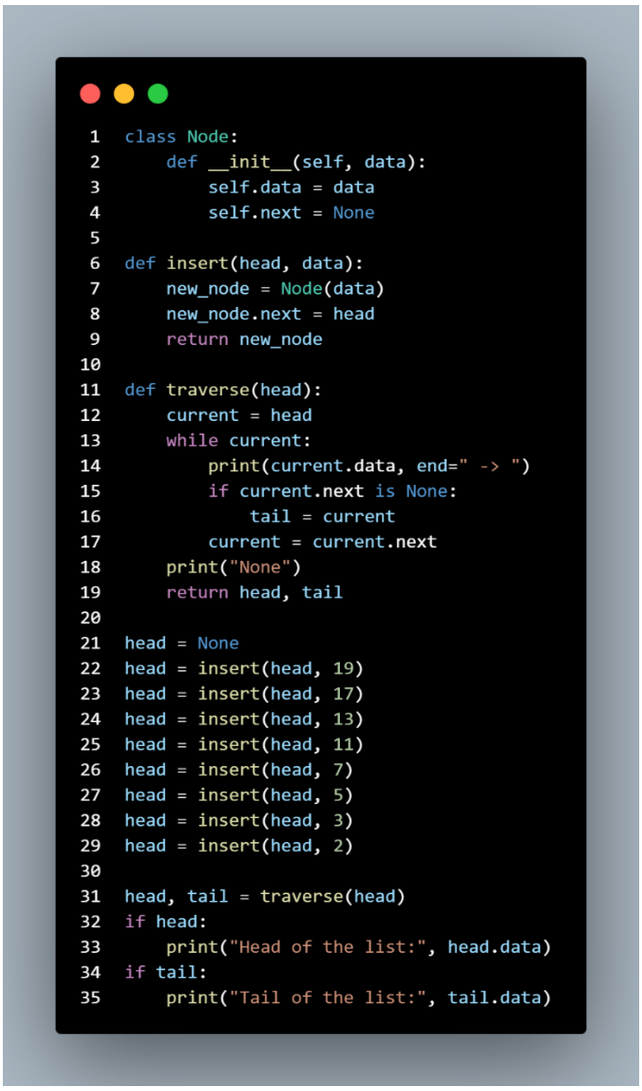
This laboratory activity aims to implement the principles and techniques in:

- 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



```python
class Node:
    def __init__(self, data):
        self.data = data
        self.next = None

def insert(head, data):
    new_node = Node(data)
    new_node.next = head
    return new_node

def traverse(head):
    current = head
    while current:
        print(current.data, end=" -> ")
        if current.next is None:
            tail = current
        current = current.next
    print("None")
    return head, tail

head = None
head = insert(head, 19)
head = insert(head, 17)
head = insert(head, 13)
head = insert(head, 11)
head = insert(head, 7)
head = insert(head, 5)
head = insert(head, 3)
head = insert(head, 2)

head, tail = traverse(head)
if head:
    print("Head of the list:", head.data)
if tail:
    print("Tail of the list:", tail.data)
```

Figure 1 Screenshot of program

Please refer to this link: CPE-201L-DSA-2-A/DSA_Lab_Report_6.ipynb at main · sebastianacebedo/CPE-201L-DSA-2-A

This image shows a singly linked list of prime numbers less than 20, prints all the values in order, and displays the head and tail of the list.

IV. Conclusion

In summary, a linked list is a way to organize data where each item is in its own node, kind of like links in a chain. Each node has the data and a pointer called next that connects it to the following node.

Linked lists are important in data structures and algorithms because they let us store and manage data that changes often which is useful for many algorithms and programs that need flexible and efficient ways to handle data.

References

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

[2] GeeksforGeeks, “Singly linked list in Python,” *GeeksforGeeks*, Jul. 23, 2025. https://www.geeksforgeeks.org/python/singly-linked-list-in-python/#traversal-of-singly-linked-list-in-python