UNIVERSITY OF CALOOCAN CITY
COMPUTER ENGINEERING DEPARTMENT

Data Structure and Algorithm

Laboratory Activity No. 6

Singly Linked Lists

Submitted by:
Sorellano, John Kenneth T.

Instructor:
Engr. Maria Rizette H. Sayo

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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

ALGORITHM

1) Start
2) Create a class node.
3) Make a function to check if a number is prime.
4) Start with an empty linked list.
   - Set head and tail to none.
5) Check the numbers from 2 to 19.
   - If the number is prime, create a node with that number.
   - If the list is empty, make this node its head and tail.
6) Print all the prime numbers, head of the list and tail of the list.
7) End

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

# Chekc if the number is prime
def is_prime(n):
    if n < 2:
        return False
    for i in range(2,n):
        if n % i == 0:
            return False
    return True

# CREATING THE LINKED LIST
head = None
tail = None

# filling the list with prime numbers
for num in range(2, 20):
    if is_prime(num):
        new_node = Node(num)
        if head is None:
            head = new_node
            tail = new_node
        else:
            tail.next = new_node
            tail = new_node

# displaying the linked list
print("prime number on the linked lists:")
current = head
while current:
    print(current.data, end=" ")
    current = current.next

print(f"\nHead:", head.data)
print(f"Tail:", tail.data)
```

```
prime number on the linked lists:
2 3 5 7 11 13 17 19
Head: 2
Tail: 19
```

IV. Conclusion

In conclusion, this program demonstrates the function of singly linked list by using the prime number as data, and also it shows the head of the linked lists and tail of the linked lists function of the program.

References

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