Activity No. Midterm Skill Test	
Course Code: CPE 201L	**Program: BSCPE**
Course Title: Data Structures and Algorithms	**Date Performed: 09 – 06 – 2024**
Section: 2A	**Date Submitted: 09 – 06 – 2024**
Name: April Anne A. Ruperto	**Instructor: Engr. Maria Rizette H. Sayo**

1.Objectives

- Implement a program using singly linked list
- Display a list of odd integers from 1 to 30
- Create an interactive menu that can append and delete a node within the list

2. Discussion

A linked list is a linear data structure where organization of a list where each item in the list is in a separate node. The list starts with the node called head and last node called tail. In Singly Linked List, we could only transverse each node from head to tail. Each node contains data and a link to next node.

3. Materials and Equipment

Windows Operating System
Google Colab

4. Procedure

- Create a Node class that will represent the elements in the list.
- Create a SinglyLinkedList that will manage the operations within the entire linked list.

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

class SinglyLinkedList:
  def __init__(self):
    self.head = None
    self.tail = None

  def print_data(self):
    current = self.head
    while current:
      print(current.data, end = " > ")
      current = current.next
    print(None)

  def insert_at_end(self, data):
    new_node = Node(data)
    if not self.head:
      self.head = new_node
      self.tail = new_node
    else:
      self.tail.next = new_node
      self.tail = new_node
```

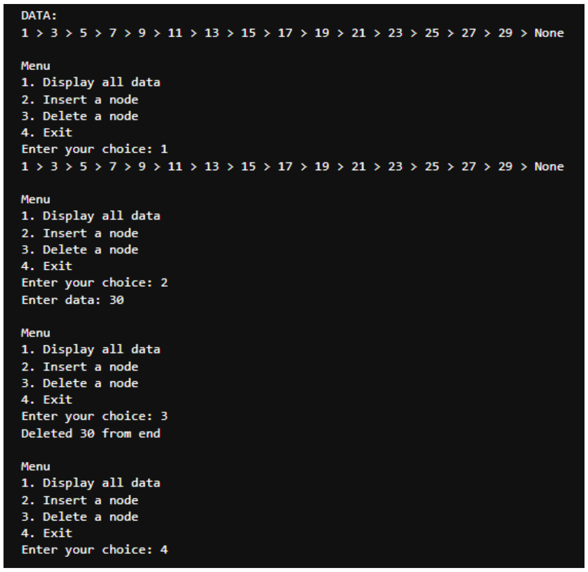
```
 def delete_from_end(self):
  deleted_data = self.tail.data

  if self.head == self.tail:
   self.head = self.tail = None
  else:
   current = self.head
   while current.next != self.tail:
    current = current.next
   current.next = None
   self.tail = current

  print(f"Deleted {deleted_data} from end")
  return deleted_data

def is_odd(num):
  if num % 2 != 0:
   return True
  else:
   return False
```

- Add an interactive menu to access the operations created in SinglyLinkedList.

```
def menu():
 linked_list = SinglyLinkedList()
 for number in range(1,30):
  if is_odd(number):
   linked_list.insert_at_end(number)
 print("DATA:")
 linked_list.print_data()

 while True:
  print("\nMenu")
  print("1. Display all data")
  print("2. Insert a node")
  print("3. Delete a node")
  print("4. Exit")
  choice = int(input("Enter your choice: "))

  if choice == 1:
   linked_list.print_data()

  if choice == 2:
   data = int(input("Enter data: "))
   linked_list.insert_at_end(data)

  if choice == 3:
   linked_list.delete_from_end()
```

```
    if choice == 4:
      break

if __name__ == "__main__":
  SinglyLinkedList()

menu()
```

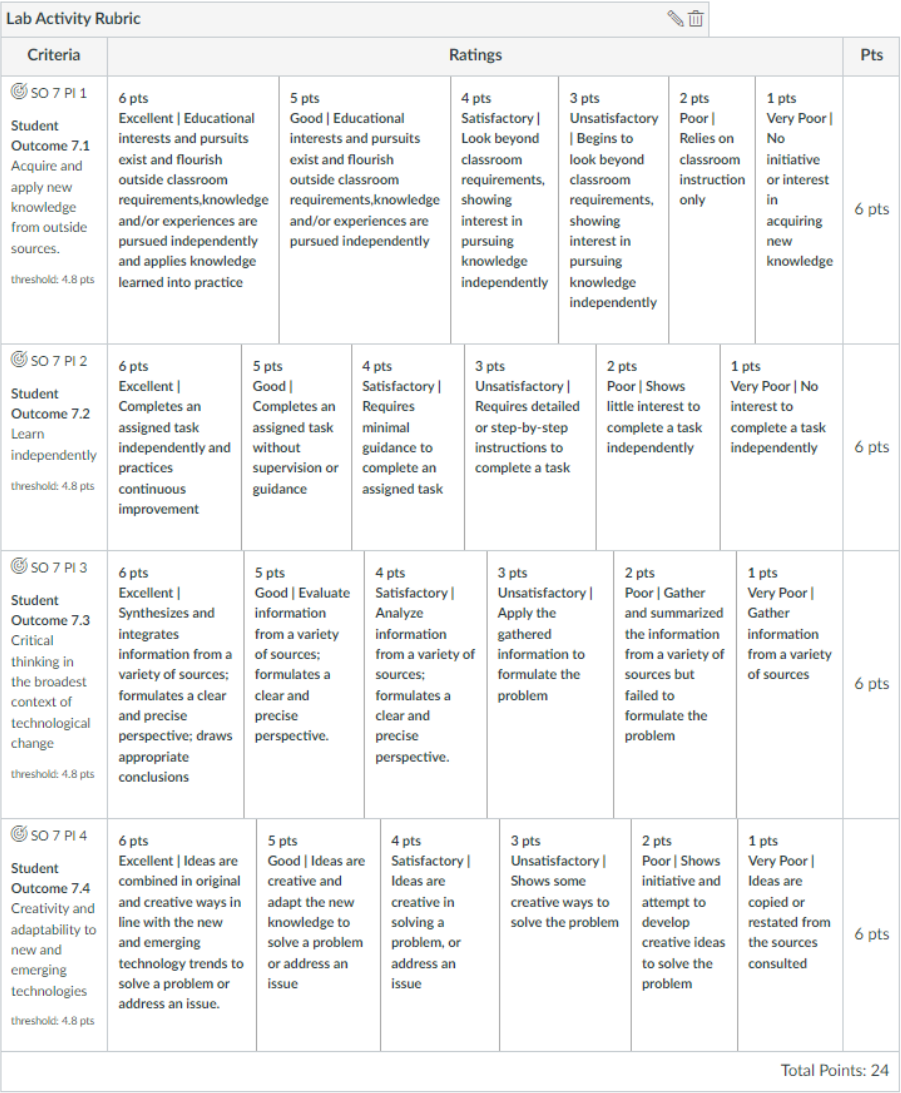
5. Output



```
DATA:
1 > 3 > 5 > 7 > 9 > 11 > 13 > 15 > 17 > 19 > 21 > 23 > 25 > 27 > 29 > None

Menu
1. Display all data
2. Insert a node
3. Delete a node
4. Exit
Enter your choice: 1
1 > 3 > 5 > 7 > 9 > 11 > 13 > 15 > 17 > 19 > 21 > 23 > 25 > 27 > 29 > None

Menu
1. Display all data
2. Insert a node
3. Delete a node
4. Exit
Enter your choice: 2
Enter data: 30

Menu
1. Display all data
2. Insert a node
3. Delete a node
4. Exit
Enter your choice: 3
Deleted 30 from end

Menu
1. Display all data
2. Insert a node
3. Delete a node
4. Exit
Enter your choice: 4
```

Please follow this link: CPE-201L-DSA-2-A/Midterm Skill Test/Midterm_Skill_Test.ipynb at main · Ruperto-April-Anne/CPE-201L-DSA-2-A

6. Conclusion



Lab Activity Rubric

Criteria	Ratings						Pts
SO 7 PI 1 **Student Outcome 7.1** Acquire and apply new knowledge from outside sources. threshold: 4.8 pts	6 pts Excellent | Educational interests and pursuits exist and flourish outside classroom requirements,knowledge and/or experiences are pursued independently and applies knowledge learned into practice	5 pts Good | Educational interests and pursuits exist and flourish outside classroom requirements,knowledge and/or experiences are pursued independently	4 pts Satisfactory | Look beyond classroom requirements, showing interest in pursuing knowledge independently	3 pts Unsatisfactory | Begins to look beyond classroom requirements, showing interest in pursuing knowledge independently	2 pts Poor | Relies on classroom instruction only	1 pts Very Poor | No initiative or interest in acquiring new knowledge	6 pts
SO 7 PI 2 **Student Outcome 7.2** Learn independently threshold: 4.8 pts	6 pts Excellent | Completes an assigned task independently and practices continuous improvement	5 pts Good | Completes an assigned task without supervision or guidance	4 pts Satisfactory | Requires minimal guidance to complete an assigned task	3 pts Unsatisfactory | Requires detailed or step-by-step instructions to complete a task	2 pts Poor | Shows little interest to complete a task independently	1 pts Very Poor | No interest to complete a task independently	6 pts
SO 7 PI 3 **Student Outcome 7.3** Critical thinking in the broadest context of technological change threshold: 4.8 pts	6 pts Excellent | Synthesizes and integrates information from a variety of sources; formulates a clear and precise perspective; draws appropriate conclusions	5 pts Good | Evaluate information from a variety of sources; formulates a clear and precise perspective.	4 pts Satisfactory | Analyze information from a variety of sources; formulates a clear and precise perspective.	3 pts Unsatisfactory | Apply the gathered information to formulate the problem	2 pts Poor | Gather and summarized the information from a variety of sources but failed to formulate the problem	1 pts Very Poor | Gather information from a variety of sources	6 pts
SO 7 PI 4 **Student Outcome 7.4** Creativity and adaptability to new and emerging technologies threshold: 4.8 pts	6 pts Excellent | Ideas are combined in original and creative ways in line with the new and emerging technology trends to solve a problem or address an issue.	5 pts Good | Ideas are creative and adapt the new knowledge to solve a problem or address an issue	4 pts Satisfactory | Ideas are creative in solving a problem, or address an issue	3 pts Unsatisfactory | Shows some creative ways to solve the problem	2 pts Poor | Shows initiative and attempt to develop creative ideas to solve the problem	1 pts Very Poor | Ideas are copied or restated from the sources consulted	6 pts

Total Points: 24