Midterm Skill Test	
Course Code: CPE 201L	**Program: CPE**
Course Title: Data Structure and Algorithms	**Date Performed: 09-06-2025**
Section: 2-A	**Date Submitted: 09-06-2025**
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1.Objectives

- Create a singly-linked list that contains odd numbers from 1 to 30 and display all the values in the list.
- Practice how to add a new node at the end and delete a specific node from the list.

2. Discussion

This activity is all about understanding how singly-linked lists work. A singly-linked list is a type of data structure where each element (called a node) contains a value and a pointer to the next node. By using odd numbers from 1 to 30, I understand how to build the list manually and make sure the values are added correctly. Then, by displaying all the data, I learned how to move through the list from the head to the end, one node at a time. The append operation teaches me how to add a new node at the end of the list, which means I need to find the last node and link it to the new one. The delete operation shows how to remove a node with a specific value, which involves updating the pointer of the previous node so it skips over the one I want to delete. Overall, this activity helps me understand how data is stored, accessed, and modified in a linked list, which is super useful for solving problems where flexible memory management is needed.

3. Materials and Equipment

- **GitHub** to store my files and share them with my professor.
- **Google Colab** to write and run Python code directly in my browser without installing anything**.**
- **Inside VS Code,** I used the **CodeSnap extension** to take screenshots of my code**.**

4. Procedure

In this activity, I created a singly-linked list using Python that stores odd numbers from 1 to 29. I used the append() method to build the list and the display() method to show all the values. I also added a feature where the user can input a number to delete, and the program removes that node using the delete() method. This helped me understand how to manage data using pointers and how to update links when inserting or deleting nodes.

5. Output

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

class LinkedList:
    def __init__(self):
        self.head = None

    def display(self):
        current = self.head
        while current:
            print(current.data, end=" ")
            if current.next:
                print("->", end=" ")
            current = current.next

    def append(self, data):
        new_node = Node(data)
        if not self.head:
            self.head = new_node
            return
        last = self.head
        while last.next:
            last = last.next
        last.next = new_node

    def delete(self, key):
        current = self.head
        prev = None
        while current and current.data != key:
            prev = current
            current = current.next
        if not current:
            return
        if prev:
            prev.next = current.next
        else:
            self.head = current.next


ll = LinkedList()
ll.append(1)
ll.append(3)
ll.append(5)
ll.append(7)
ll.append(9)
ll.append(11)
ll.append(13)
ll.append(15)
ll.append(17)
ll.append(19)
ll.append(21)
ll.append(23)
ll.append(25)
ll.append(27)
ll.append(29)
print("Initial linked list:")
ll.display()


input_number = int(input("\nEnter a number to delete from the linked list: "))
ll.delete(input_number)
print(f"Linked list after deleting odd number {input_number}:")
ll.display()
```

```
Initial linked list:
1 -> 3 -> 5 -> 7 -> 9 -> 11 -> 13 -> 15 -> 17 -> 19 -> 21 -> 23 -> 25 -> 27 -> 29
Enter a number to delete from the linked list: 15

Linked list after deleting odd number 15:
1 -> 3 -> 5 -> 7 -> 9 -> 11 -> 13 -> 17 -> 19 -> 21 -> 23 -> 25 -> 27 -> 29
```

6. Conclusion

In conclusion, this activity helped me understand how singly-linked lists work by allowing me to display, append, and delete nodes. I learned how each node connects to the next using pointers and how to manage data step-by-step.

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