Assignment On

'ADVANCED DATA STRUCTURES AND ALGORITHMS'

(Assignment-1)

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Submitted to:

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Question:

1. **Implement a Singly Linked List to Manage Patient Details (Name, Age, ID). Perform Insertion and Deletion.**

   Code :

```python
class Patient:    def __init__(self, name,
age, patient_id):
     self.name = name
self.age = age        self.id
= patient_id
self.next = None


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


    # Insert patient at beginning     def
insert_patient(self, name, age, patient_id):
new_patient = Patient(name, age, patient_id)
new_patient.next = self.head        self.head =
new_patient
    print("Patient inserted:", name)


    # Delete patient by ID     def
delete_patient(self, patient_id):
```

```python
        temp = self.head
        prev = None

        # If head node itself holds the ID        if temp is
not None and temp.id == patient_id:
            self.head = temp.next        print("Patient deleted
with ID:", patient_id)
            return

        # Search for the ID        while temp is not None
and temp.id != patient_id:            prev = temp
            temp = temp.next

        # If patient not found
        if temp is None:
            print("Patient not found with ID:", patient_id)
            return

        # Unlink the node        prev.next =
temp.next        print("Patient deleted with ID:",
patient_id)

    # Display all patients
    def display(self):
        temp = self.head        if
temp is None:
            print("No patients in
the list.")            return

        print("\n--- Patient List ---")
        while temp is not None:
```

```python
        print(f"Name: {temp.name}, Age: {temp.age}, ID: {temp.id}")
    temp = temp.next


# ------------------------
# Example Usage
# ------------------------ plist
= PatientList()

plist.insert_patient("Shiva", 24, 101)
plist.insert_patient("Nikitha", 22, 102)
plist.insert_patient("MC", 25, 103)
    plist.display()
plist.delete_patient(102)                plist.display()
```

Output:

```
Patient inserted: Shiva
Patient inserted: Nikitha
Patient inserted: MC

--- Patient List ---
Name: MC, Age: 25, ID: 103
Name: Nikitha, Age: 22, ID: 102
Name: Shiva, Age: 24, ID: 101
Patient deleted with ID: 102

--- Patient List ---
Name: MC, Age: 25, ID: 103
Name: Shiva, Age: 24, ID: 101
```