

Assignment On:
“ ADVANCED DATA STRUCTURES AND ALGORITHMS ”
(Assignment 1)

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Question:

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

Code:

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

# -----
# Example Usage

```

```
# -----  
plist = PatientList()  
  
plist.insert_patient("Ravi", 30, 101)  
plist.insert_patient("Sita", 25, 102)  
plist.insert_patient("Kiran", 40, 103)  
  
plist.display()  
  
plist.delete_patient(102)  
  
plist.display()
```

Output:

```
Patient inserted: Ravi  
Patient inserted: Sita  
Patient inserted: Kiran  
  
--- Patient List ---  
Name: Kiran, Age: 40, ID: 103  
Name: Sita, Age: 25, ID: 102  
Name: Ravi, Age: 30, ID: 101  
Patient deleted with ID: 102  
  
--- Patient List ---  
Name: Kiran, Age: 40, ID: 103  
Name: Ravi, Age: 30, ID: 101
```