

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
```