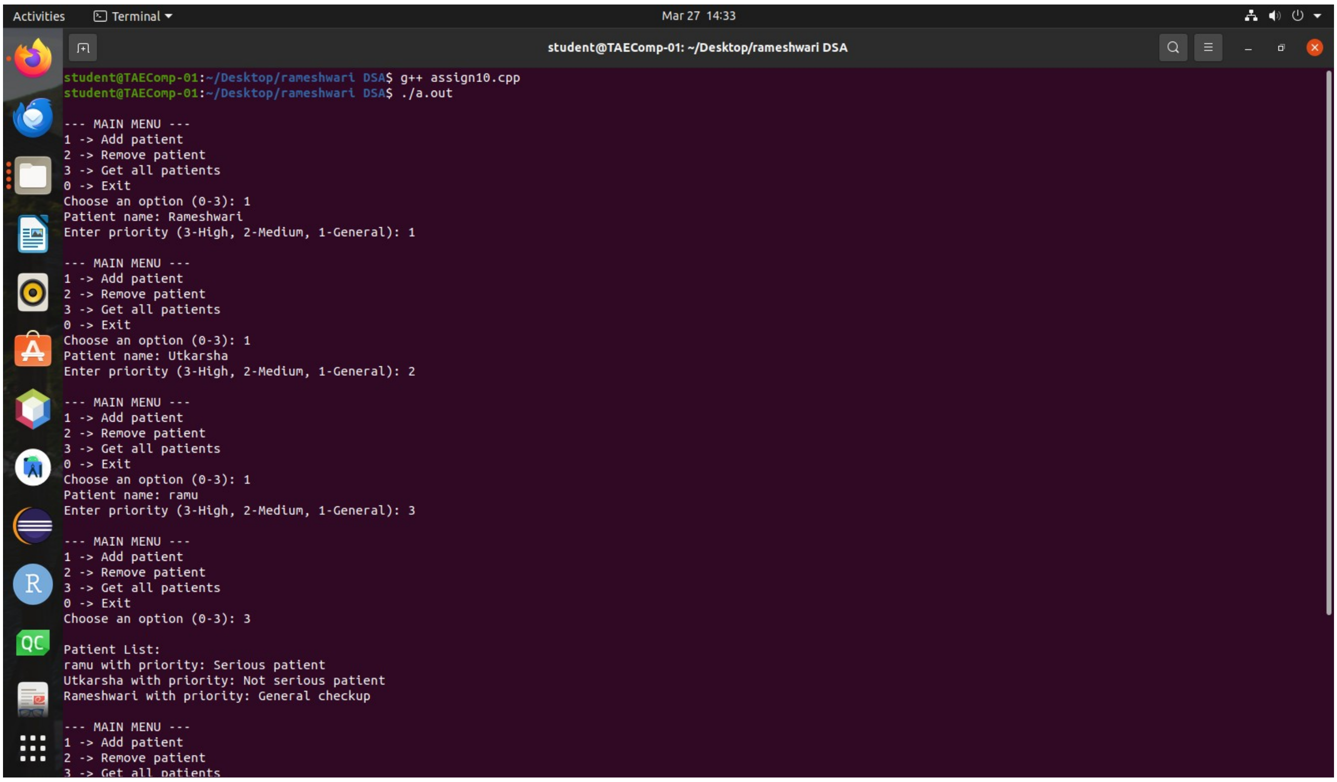
Assignment 10

code:

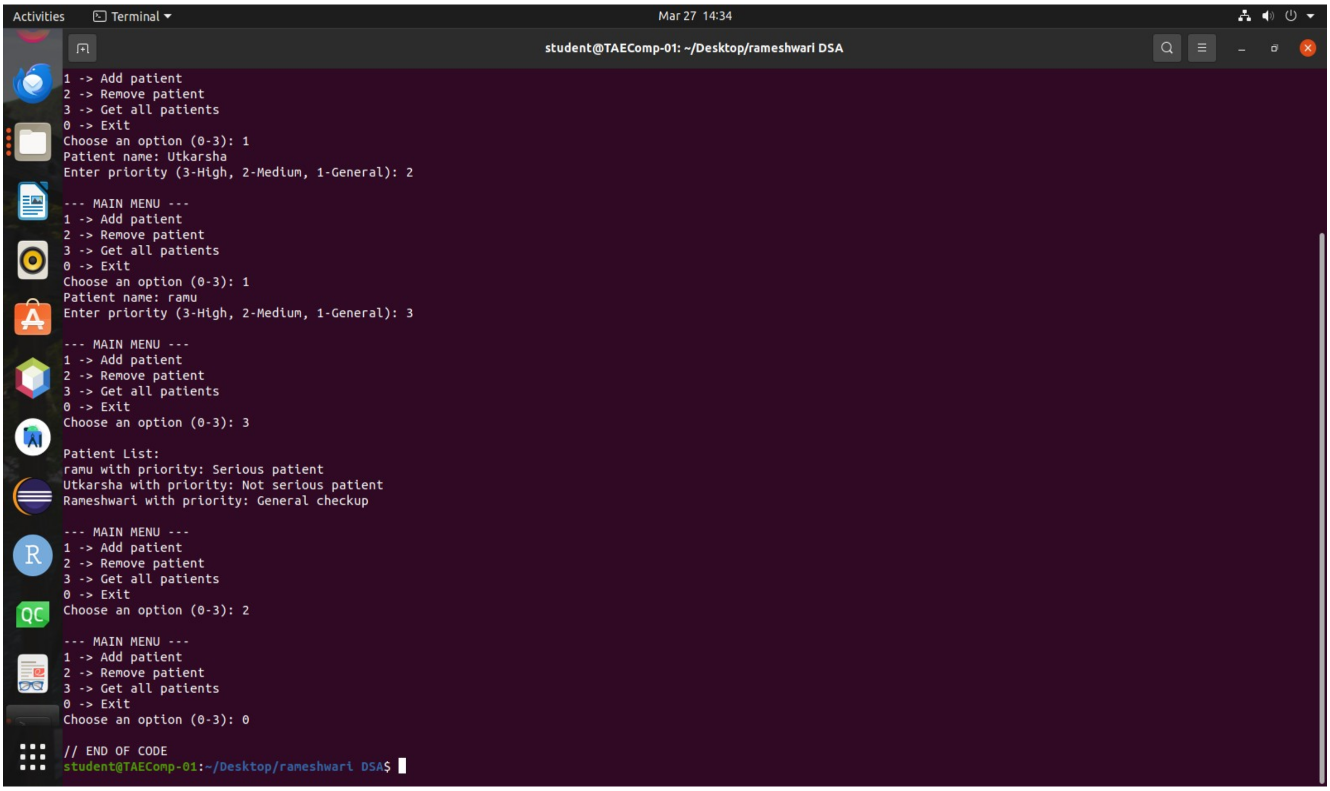
```
#include <iostream>
using namespace std;

class Node {
public:
    Node *next;
    int priority;
    string data;

    Node(string d, int prior) {
        priority = prior;
        data = d;
        next = NULL;
    }
};

class PriorityQueue {
public:
    Node *front = NULL;

    // Insert patient in priority order
    void insert(string d, int prior) {
        Node *temp = new Node(d, prior);

        // If queue is empty OR new node has higher priority than front
        if (front == NULL || front->priority < prior) {
            temp->next = front;
            front = temp;
        } else {
            Node *rear = front;
            while (rear->next != NULL && rear->next->priority >= prior) {
                rear = rear->next;
            }
            temp->next = rear->next;
            rear->next = temp;
        }
    }

    // Peek first patient
    void peek() {
        if (front == NULL) {
            cout << "Queue is empty!" << endl;
            return;
        }
        cout << "First patient is: " << front->data << endl;
    }

    // Remove the highest priority patient
    void pop() {
        if (front == NULL) {
            cout << "No patients to remove!" << endl;
            return;
        }
        Node *temp = front;
        front = front->next;
        delete temp; // Prevent memory leak
    }

    // Display all patients
    void dis() {
        if (front == NULL) {
            cout << "Empty queue." << endl;
            return;
        }
        cout << "\nPatient List:\n";
        Node *curr = front;
        while (curr != NULL) {
            string currPrior;
            if (curr->priority == 3)
                currPrior = "Serious patient";
            else if (curr->priority == 2)
                currPrior = "Not serious patient";
            else
                currPrior = "General checkup";

            cout << curr->data << " with priority: " << currPrior << endl;
            curr = curr->next;
        }
    }
};

int main() {
    string name;
    int priority, ch;

    PriorityQueue q;

    do {
        cout << "\n--- MAIN MENU ---";
        cout << "\n1 -> Add patient";
        cout << "\n2 -> Remove patient";
        cout << "\n3 -> Get all patients";
        cout << "\n0 -> Exit";
        cout << "\nChoose an option (0-3): ";
        cin >> ch;

        switch (ch) {
            case 1:
                cout << "Patient name: ";
                cin.ignore();
                getline(cin, name);
                cout << "Enter priority (3-High, 2-Medium, 1-General): ";
                cin >> priority;
                if (priority < 1 || priority > 3) {
                    cout << "Invalid priority! Enter between 1-3.\n";
                    break;
                }
                q.insert(name, priority);
                break;

            case 2:
                q.pop();
                break;

            case 3:
                q.dis();
                break;

            case 0:
                cout << "\n// END OF CODE\n";
                exit(0);

            default:
```

```
            cout << "Invalid choice! Try again.\n";
        }
    } while (ch != 0);
}
```

Output:



```
student@TAEComp-01:~/Desktop/rameshwari DSA$ g++ assign10.cpp
student@TAEComp-01:~/Desktop/rameshwari DSA$ ./a.out

--- MAIN MENU ---
1 -> Add patient
2 -> Remove patient
3 -> Get all patients
0 -> Exit
Choose an option (0-3): 1
Patient name: Rameshwari
Enter priority (3-High, 2-Medium, 1-General): 1

--- MAIN MENU ---
1 -> Add patient
2 -> Remove patient
3 -> Get all patients
0 -> Exit
Choose an option (0-3): 1
Patient name: Utkarsha
Enter priority (3-High, 2-Medium, 1-General): 2

--- MAIN MENU ---
1 -> Add patient
2 -> Remove patient
3 -> Get all patients
0 -> Exit
Choose an option (0-3): 1
Patient name: ramu
Enter priority (3-High, 2-Medium, 1-General): 3

--- MAIN MENU ---
1 -> Add patient
2 -> Remove patient
3 -> Get all patients
0 -> Exit
Choose an option (0-3): 3

Patient List:
ramu with priority: Serious patient
Utkarsha with priority: Not serious patient
Rameshwari with priority: General checkup

--- MAIN MENU ---
1 -> Add patient
2 -> Remove patient
3 -> Get all patients
```



```
1 -> Add patient
2 -> Remove patient
3 -> Get all patients
0 -> Exit
Choose an option (0-3): 1
Patient name: Utkarsha
Enter priority (3-High, 2-Medium, 1-General): 2

--- MAIN MENU ---
1 -> Add patient
2 -> Remove patient
3 -> Get all patients
0 -> Exit
Choose an option (0-3): 1
Patient name: ramu
Enter priority (3-High, 2-Medium, 1-General): 3

--- MAIN MENU ---
1 -> Add patient
2 -> Remove patient
3 -> Get all patients
0 -> Exit
Choose an option (0-3): 3

Patient List:
ramu with priority: Serious patient
Utkarsha with priority: Not serious patient
Rameshwari with priority: General checkup

--- MAIN MENU ---
1 -> Add patient
2 -> Remove patient
3 -> Get all patients
0 -> Exit
Choose an option (0-3): 2

--- MAIN MENU ---
1 -> Add patient
2 -> Remove patient
3 -> Get all patients
0 -> Exit
Choose an option (0-3): 0

// END OF CODE
student@TAEComp-01:~/Desktop/rameshwari DSA$
```