

Assignment No: 04

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Class: SY-1

Batch: C

PRN: B25CE2010

Title: Write a program that implements a simple task scheduler using a singly linked list. Each node in the linked list represents a task with its priority and execution time. Tasks are scheduled based on their priority, with higher priority tasks being executed first.

Program:

```
#include <iostream>
#include <string>
using namespace std;
struct Task {
    string name;
    int priority;
    int execTime;
    Task* next;
    Task(const string& n, int p, int e) : name(n), priority(p), execTime(e), next(nullptr) {}
};
class TaskScheduler
{
private:
    Task* head;
public:
    TaskScheduler() : head(nullptr) {}
    ~TaskScheduler() {
        while (head) {
            Task* temp = head;
            head = head->next;
            delete temp;
        }
    }
    void addTask(const string& name, int priority, int execTime) {
        Task* newTask = new Task(name, priority, execTime);
        if (!head || head->priority < priority) {
            newTask->next = head;
            head = newTask;
        } else {
            Task* current = head;
            while (current->next && current->next->priority >= priority) {
                current = current->next;
            }
            newTask->next = current->next;
            current->next = newTask;
        }
    }
    void executeTasks() {
        Task* current = head;
```

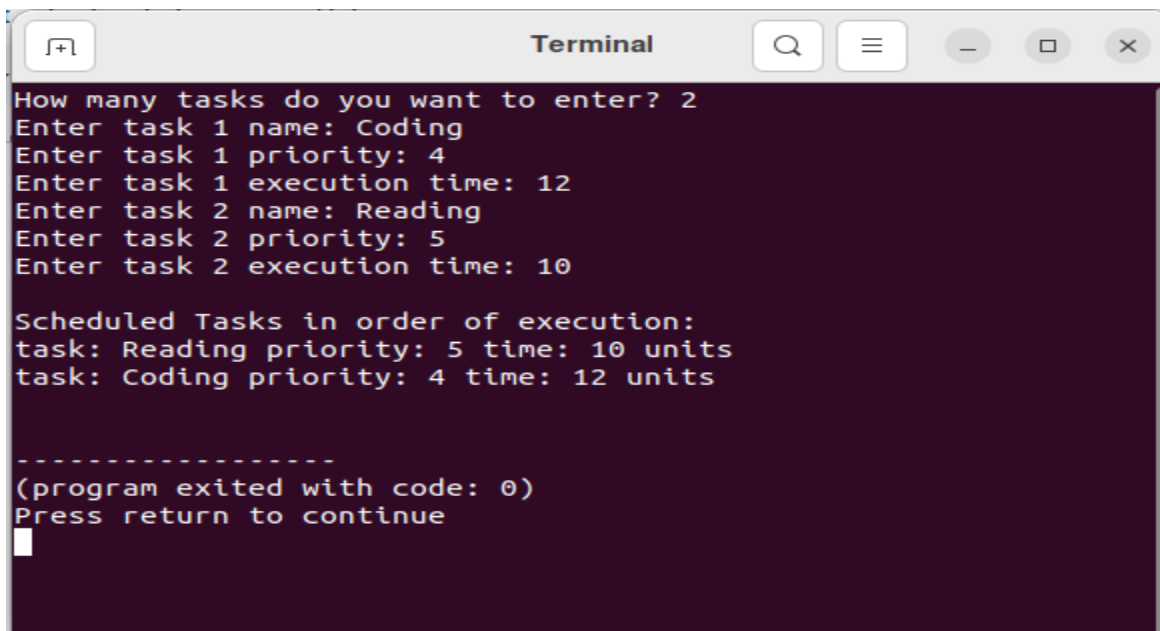
```

        while (current) {
            cout << "task: " << current->name
                << " priority: " << current->priority
                << " time: " << current->execTime << " units\n";
            current = current->next;
        }
    }
};

int main() {
    TaskScheduler scheduler;
    int n;
    cout << "How many tasks do you want to enter? ";
    cin >> n;
    cin.ignore();
    for (int i = 0; i < n; ++i) {
        string name;
        int priority, execTime;
        cout << "Enter task " << i + 1 << " name: ";
        getline(cin, name);
        cout << "Enter task " << i + 1 << " priority: ";
        cin >> priority;
        cout << "Enter task " << i + 1 << " execution time: ";
        cin >> execTime;
        cin.ignore();
        scheduler.addTask(name, priority, execTime);
    }
    cout << "\nScheduled Tasks in order of execution:\n";
    scheduler.executeTasks();
    return 0;
}

```

Output:



```

Terminal
How many tasks do you want to enter? 2
Enter task 1 name: Coding
Enter task 1 priority: 4
Enter task 1 execution time: 12
Enter task 2 name: Reading
Enter task 2 priority: 5
Enter task 2 execution time: 10

Scheduled Tasks in order of execution:
task: Reading priority: 5 time: 10 units
task: Coding priority: 4 time: 12 units

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(program exited with code: 0)
Press return to continue

```