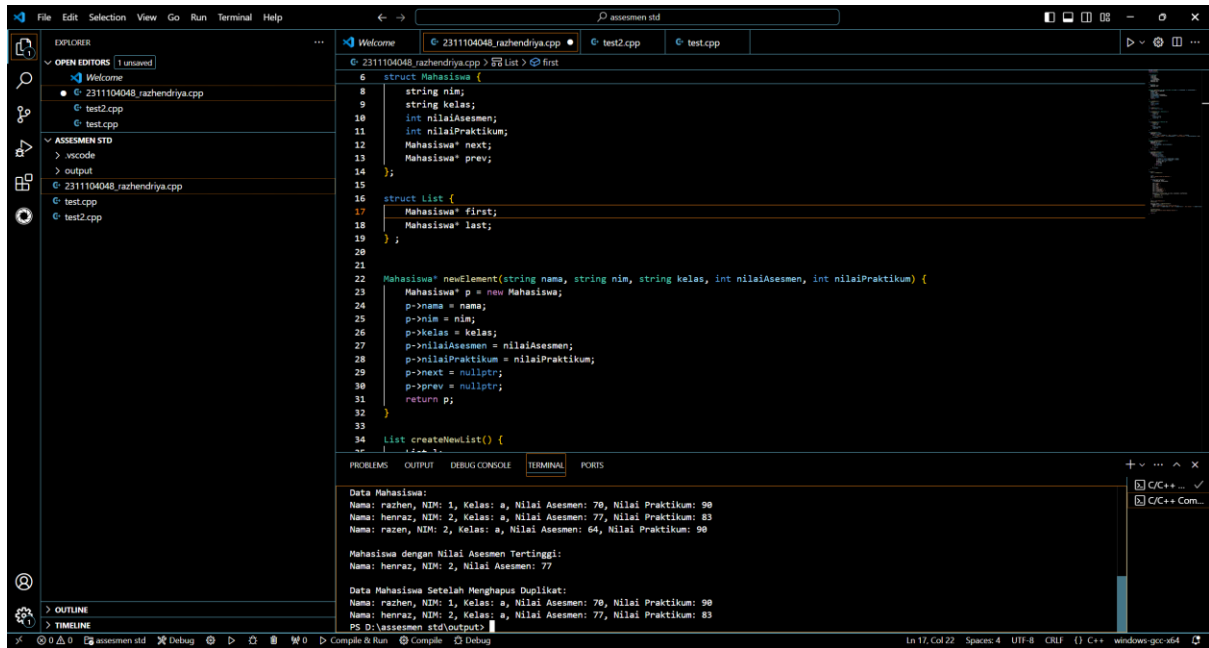


Razhendriya Vania Ramadhan Suganjarsarwat

23111004048

```
1 #include <iostream>
2 #include <string>
3 using namespace std;
4
5 struct Mahasiswa {
6     string nama;
7     string nim;
8     string kelas;
9     int nilaiAsesmen;
10    int nilaiPraktikum;
11    Mahasiswa* next;
12    Mahasiswa* prev;
13 };
14
15 struct list {
16    Mahasiswa* first;
17    Mahasiswa* last;
18 };
19
20 Mahasiswa* newMahasiswa(string nama, string nim, string kelas, int nilaiAsesmen, int nilaiPraktikum) {
21    Mahasiswa* p = new Mahasiswa;
22    p->nama = nama;
23    p->nim = nim;
24    p->kelas = kelas;
25    p->nilaiAsesmen = nilaiAsesmen;
26    p->nilaiPraktikum = nilaiPraktikum;
27    p->next = nullptr;
28    p->prev = nullptr;
29    return p;
30 }
31
32 list createMahasiswaList() {
33    list l;
34    l.first = nullptr;
35    l.last = nullptr;
36    return l;
37 }
38
39 bool isEmpty(list l) {
40    return l.first == nullptr;
41 }
42
43 void insertFirst(list l, Mahasiswa* p) {
44    if (isEmpty(l)) {
45        l.first = p;
46        l.last = p;
47    } else {
48        p->next = l.first;
49        l.first->prev = p;
50        l.first = p;
51    }
52 }
53
54 void insertLast(list l, Mahasiswa* p) {
55    if (isEmpty(l)) {
56        l.first = p;
57        l.last = p;
58    } else {
59        p->prev = l.last;
60        l.last->next = p;
61        l.last = p;
62    }
63 }
64
65 void printList(list l) {
66    Mahasiswa* p = l.first;
67    while (p != nullptr) {
68        cout << "Nama: " << p->nama << ", NIM: " << p->nim << ", Kelas: " << p->kelas
69        << ", Nilai Asesmen: " << p->nilaiAsesmen << ", Nilai Praktikum: " << p->nilaiPraktikum << endl;
70        p = p->next;
71    }
72 }
73
74 Mahasiswa* findHighestAsesmen(list l) {
75    Mahasiswa* p = l.first;
76    Mahasiswa* max = p;
77    while (p != nullptr) {
78        if (p->nilaiAsesmen > max->nilaiAsesmen) {
79            max = p;
80        }
81        p = p->next;
82    }
83    return max;
84 }
85
86 void deleteDuplicates(list l) {
87    Mahasiswa* p = l.first;
88    while (p != nullptr) {
89        Mahasiswa* q = p->next;
90        while (q != nullptr) {
91            if (q->nama == p->nama) {
92                if (q->prev != nullptr) q->prev->next = q->next;
93                if (q->next != nullptr) q->next->prev = q->prev;
94                if (q == l.last) l.last = q->prev;
95                Mahasiswa* temp = q;
96                q = q->next;
97                delete temp;
98            } else {
99                q = q->next;
100            }
101        }
102        p = p->next;
103    }
104 }
105
106
107 int main() {
108    list l = createMahasiswaList();
109
110    int n;
111    cout << "Masukkan jumlah data mahasiswa: ";
112    cin >> n;
113
114    for (int i = 0; i < n; i++) {
115        string nama, nim, kelas;
116        int nilaiAsesmen, nilaiPraktikum;
117
118        cout << "Nama: ";
119        cin >> nama;
120        cout << "NIM: ";
121        cin >> nim;
122        cout << "Kelas: ";
123        cin >> kelas;
124        cout << "Nilai Asesmen: ";
125        cin >> nilaiAsesmen;
126        cout << "Nilai Praktikum: ";
127        cin >> nilaiPraktikum;
128
129        Mahasiswa* p = newMahasiswa(nama, nim, kelas, nilaiAsesmen, nilaiPraktikum);
130        if ((i % 5 == 0) && i > 0) {
131            insertLast(l, p);
132        } else {
133            insertFirst(l, p);
134        }
135    }
136
137    cout << "\nData Mahasiswa:\n";
138    printList(l);
139
140    Mahasiswa* highest = findHighestAsesmen(l);
141    if (highest != nullptr) {
142        cout << "\nMahasiswa dengan Nilai Asesmen tertinggi:\n";
143        cout << "Nama: " << highest->nama << ", NIM: " << highest->nim << ", Nilai Asesmen: " << highest->nilaiAsesmen << endl;
144    }
145
146    deleteDuplicates(l);
147    cout << "\nData Mahasiswa Setelah Menghapus Duplikat:\n";
148    printList(l);
149
150    return 0;
151 }
```

Contoh outputnya



The screenshot shows the Visual Studio Code interface with a C++ project named 'assessmen std'. The Explorer panel on the left shows the file structure with '2311104048_razhendriya.cpp' selected. The main editor displays the source code of the program, which includes a linked list structure and functions for creating and displaying the list. The Output panel at the bottom shows the program's execution results.

```
6 struct Mahasiswa {
7     string nim;
8     string kelas;
9     int nilaiAsesmen;
10    int nilaiPraktikum;
11    Mahasiswa* next;
12    Mahasiswa* prev;
13 };
14
15
16 struct List {
17     Mahasiswa* first;
18     Mahasiswa* last;
19 };
20
21
22 Mahasiswa* newElement(string nama, string nim, string kelas, int nilaiAsesmen, int nilaiPraktikum) {
23     Mahasiswa* p = new Mahasiswa;
24     p->nama = nama;
25     p->nim = nim;
26     p->kelas = kelas;
27     p->nilaiAsesmen = nilaiAsesmen;
28     p->nilaiPraktikum = nilaiPraktikum;
29     p->next = nullptr;
30     p->prev = nullptr;
31     return p;
32 }
33
34 List createNewList() {
35     List l;
36     l.first = nullptr;
37     l.last = nullptr;
38     return l;
39 }
40
41 void displayList(List l) {
42     if (l.first == nullptr) {
43         cout << "List is empty" << endl;
44         return;
45     }
46     Mahasiswa* p = l.first;
47     while (p != nullptr) {
48         cout << p->nama << ", NIM: " << p->nim << ", Kelas: " << p->kelas << ", Nilai Asesmen: " << p->nilaiAsesmen << ", Nilai Praktikum: " << p->nilaiPraktikum << endl;
49         p = p->next;
50     }
51 }
52
53 void deleteList(List l) {
54     if (l.first == nullptr) {
55         return;
56     }
57     Mahasiswa* p = l.first;
58     while (p != nullptr) {
59         delete p;
60         p = p->next;
61     }
62     l.first = nullptr;
63     l.last = nullptr;
64 }
65
66 int main() {
67     List l = createNewList();
68     displayList(l);
69     deleteList(l);
70     displayList(l);
71     return 0;
72 }
```

Output:

```
Data Mahasiswa:
Nama: razhen, NIM: 1, Kelas: a, Nilai Asesmen: 70, Nilai Praktikum: 90
Nama: henraz, NIM: 2, Kelas: a, Nilai Asesmen: 77, Nilai Praktikum: 83
Nama: razen, NIM: 2, Kelas: a, Nilai Asesmen: 64, Nilai Praktikum: 90

Mahasiswa dengan Nilai Asesmen Tertinggi:
Nama: henraz, NIM: 2, Nilai Asesmen: 77

Data Mahasiswa Setelah Menghapus Duplikat:
Nama: razhen, NIM: 1, Kelas: a, Nilai Asesmen: 70, Nilai Praktikum: 90
Nama: henraz, NIM: 2, Kelas: a, Nilai Asesmen: 77, Nilai Praktikum: 83
PS D:\assessmen std\output>
```