

ILHAM LII ASSIDAQ

2311104068

SE0702

## Praktikum Struktur Data Asesmen Praktikum CLO 1

### 1-ASSESSMENT.cpp

```
1 //ILHAM LII
2 //2311104068
3 //SE0703
4 //ASSESSMENT
5 //=====
6 //=====
7
8 #include <iostream>
9 #include <string>
10
11 using namespace std;
12
13 struct Mahasiswa {
14     string nama;
15     int NIM;
16     string kelas;
17     int nilaiAsesmen;
18     int nilaiPraktikum;
19 };
20
21 struct Node {
22     Mahasiswa data;
23     Node* next;
24     Node* prev;
25 };
26
27 struct DoubleLinkedList {
28     Node* head;
29     Node* tail;
30 };
31
32 DoubleLinkedList newList() {
33     DoubleLinkedList list;
```

```

33     DoubleLinkedList list;
34     list.head = NULL;
35     list.tail = NULL;
36     return list;
37 }
38
39 Node* newElement(Mahasiswa data) {
40     Node* newNode = new Node();
41     newNode->data = data;
42     newNode->next = NULL;
43     newNode->prev = NULL;
44     return newNode;
45 }
46
47 bool isEmpty(DoubleLinkedList list) {
48     return list.head == NULL;
49 }
50
51 void insertLast(DoubleLinkedList &list, Node* newNode) {
52     if (isEmpty(list)) {
53         list.head = list.tail = newNode;
54     } else {
55         newNode->prev = list.tail;
56         list.tail->next = newNode;
57         list.tail = newNode;
58     }
59 }
60
61 void printList(DoubleLinkedList list) {
62     Node* current = list.head;
63     while (current != NULL) {

```

```

64     cout << "Nama: " << current->data.nama;
65     cout << ", NIM: " << current->data.NIM;
66     cout << ", Kelas: " << current->data.kelas;
67     cout << ", Nilai Asesmen: " << current->data.nilaiAsesmen;
68     cout << ", Nilai Praktikum: " << current->data.nilaiPraktikum << endl;
69     current = current->next;
70 }
71 }
72
73 Mahasiswa findMaxAsesmen(DoubleLinkedList list) {
74     Node* current = list.head;
75     Mahasiswa maxData = current->data;
76     while (current != NULL) {
77         if (current->data.nilaiAsesmen > maxData.nilaiAsesmen) {
78             maxData = current->data;
79         }
80         current = current->next;
81     }
82     return maxData;
83 }
84
85 void removeDuplicate(DoubleLinkedList &list) {
86     Node* current = list.head;
87     while (current != NULL) {
88         Node* checker = current->next;
89         while (checker != NULL) {
90             if (checker->data.NIM == current->data.NIM) {
91
92                 if (checker->next != NULL) {
93                     checker->next->prev = checker->prev;
94                 }
95                 if (checker->prev != NULL) {
96                     checker->prev->next = checker->next;

```

```

97         }
98         if (checker == list.tail) {
99             list.tail = checker->prev;
100         }
101         Node* duplicate = checker;
102         checker = checker->next;
103         delete duplicate;
104     } else {
105         checker = checker->next;
106     }
107 }
108 current = current->next;
109 }
110 }
111
112 int main() {
113     DoubleLinkedList list = newList();
114
115     int N;
116     cout << "\nMasukkan jumlah mahasiswa: ";
117     cin >> N;
118
119     for (int i = 0; i < N; i++) {
120         Mahasiswa mhs;
121         cout << "Nama: "; cin >> mhs.nama;
122         cout << "NIM: "; cin >> mhs.NIM;
123         cout << "Kelas: "; cin >> mhs.kelas;
124         cout << "Nilai Asesmen: "; cin >> mhs.nilaiAsesmen;
125         cout << "Nilai Praktikum: "; cin >> mhs.nilaiPraktikum;
126
127         Node* newNode = newElement(mhs);
128         insertLast(list, newNode);
129     }

```

```

112 int main() {
113     DoubleLinkedList list = newList();
114
115     int N;
116     cout << "\nMasukkan jumlah mahasiswa: ";
117     cin >> N;
118
119     for (int i = 0; i < N; i++) {
120         Mahasiswa mhs;
121         cout << "Nama: "; cin >> mhs.nama;
122         cout << "NIM: "; cin >> mhs.NIM;
123         cout << "Kelas: "; cin >> mhs.kelas;
124         cout << "Nilai Asesmen: "; cin >> mhs.nilaiAsesmen;
125         cout << "Nilai Praktikum: "; cin >> mhs.nilaiPraktikum;
126
127         Node* newNode = newElement(mhs);
128         insertLast(list, newNode);
129     }
130
131     cout << "\n=====Data Mahasiswa: =====\n";
132     printList(list);
133
134     Mahasiswa maxAsesmen = findMaxAsesmen(list);
135     cout << "\nMahasiswa dengan nilai asesmen tertinggi:\n";
136     cout << "Nama: " << maxAsesmen.nama << ", NIM: " << maxAsesmen.NIM
137         << ", Nilai Asesmen: " << maxAsesmen.nilaiAsesmen << endl;
138
139     removeDuplicate(list);
140     cout << "\nData Mahasiswa setelah menghapus duplikat:\n";
141     printList(list);
142
143     return 0;
144 }

```

Output :

```
D:\ITT SM 3\Assesment\asses x + v
NIM: 23111
Kelas: se0702
Nilai Asesmen: 90
Nilai Praktikum: 99
Nama: putrazaenarif
NIM: 23112
Kelas: se0702
Nilai Asesmen: 89
Nilai Praktikum: 88
Nama: putrazaenarif
NIM: 23112
Kelas: se0702
Nilai Asesmen: 89
Nilai Praktikum: 88

=====Data Mahasiswa: =====
Nama: ilhamlii, NIM: 23111, Kelas: se0702, Nilai Asesmen: 90, Nilai Praktikum: 99
Nama: putrazaenarif, NIM: 23112, Kelas: se0702, Nilai Asesmen: 89, Nilai Praktikum: 88
Nama: putrazaenarif, NIM: 23112, Kelas: se0702, Nilai Asesmen: 89, Nilai Praktikum: 88

Mahasiswa dengan nilai asesmen tertinggi:
Nama: ilhamlii, NIM: 23111, Nilai Asesmen: 90

Data Mahasiswa setelah menghapus duplikat:
Nama: ilhamlii, NIM: 23111, Kelas: se0702, Nilai Asesmen: 90, Nilai Praktikum: 99
Nama: putrazaenarif, NIM: 23112, Kelas: se0702, Nilai Asesmen: 89, Nilai Praktikum: 88

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Process exited after 58 seconds with return value 0
Press any key to continue . . .
```