LAPORAN PRAKTIKUM

Ujian Praktikum 1

Disusun Oleh :

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PROGRAM STUDI S1 REKAYASA PERANGKAT LUNAK

FAKULTAS INFORMATIKA

TELKOM UNIVERSITY PURWOKERTO

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1. **Source Code**

- main.cpp

```cpp
#include "dll_32.h"

int main() {
    List L;
    createNewList(L);

    int N;
    cout << "Masukkan jumlah mahasiswa: ";
    cin >> N;

    for (int i = 0; i < N; i++) {
        infotype data;

        // Input data mahasiswa
        cout << "Masukkan Nama: ";
        cin >> data.nama;
        cout << "Masukkan NIM: ";
        cin >> data.NIM;
        cout << "Masukkan Kelas: ";
        cin >> data.kelas;
        cout << "Masukkan Nilai Asesmen: ";
        cin >> data.nilaiAsesmen;
        cout << "Masukkan Nilai Praktikum: ";
        cin >> data.nilaiPraktikum;

        address P = newElement(data);
        insertLast(L, P);
    }

    cout << "Data Mahasiswa:" << endl;
    printList(L);

    printHighestAsesmen(L);

    removeDuplicateNIM(L);

    cout << "Data Mahasiswa setelah menghapus duplikat:" << endl;
    printList(L);

    return 0;
}
```

- dll_32.cpp

```cpp
#include "dll_32.h"
```

```cpp
void createNewList(List &L) {
    L.first = nullptr;
    L.last = nullptr;
}

bool isEmpty(List L) {
    return (L.first == nullptr && L.last == nullptr);
}

address newElement(infotype data) {
    address P = new Elemen;
    P->info = data;
    P->next = nullptr;
    P->prev = nullptr;
    return P;
}

void insertLast(List &L, address P) {
    if (isEmpty(L)) {
        L.first = P;
        L.last = P;
    } else {
        P->prev = L.last;
        L.last->next = P;
        L.last = P;
    }
}

void printList(List L) {
    if (isEmpty(L)) {
        cout << "List kosong!" << endl;
    } else {
        address P = L.first;
        while (P != nullptr) {
            cout << "Nama: " << P->info.nama
                 << ", NIM: " << P->info.NIM
                 << ", Kelas: " << P->info.kelas
                 << ", Nilai Asesmen: " << P->info.nilaiAsesmen
                 << ", Nilai Praktikum: " << P->info.nilaiPraktikum <<
endl;
            P = P->next;
        }
    }
}

void printHighestAsesmen(List L) {
    if (isEmpty(L)) {
        cout << "List kosong!" << endl;
```

```
        return;
    }

    address P = L.first;
    address highest = P;

    while (P != nullptr) {
        if (P->info.nilaiAsesmen > highest->info.nilaiAsesmen) {
            highest = P;
        }
        P = P->next;
    }

    cout << "Mahasiswa dengan Nilai Asesmen Tertinggi:" << endl;
    cout << "Nama: " << highest->info.nama
         << ", NIM: " << highest->info.NIM
         << ", Kelas: " << highest->info.kelas
         << ", Nilai Asesmen: " << highest->info.nilaiAsesmen
         << ", Nilai Praktikum: " << highest->info.nilaiPraktikum <<
endl;
}

void removeDuplicateNIM(List &L) {
    if (isEmpty(L)) {
        return;
    }

    address P = L.first;
    while (P != nullptr) {
        address Q = P->next;
        while (Q != nullptr) {
            if (Q->info.NIM == P->info.NIM) {
                address duplicate = Q;
                if (Q->prev != nullptr) {
                    Q->prev->next = Q->next;
                }
                if (Q->next != nullptr) {
                    Q->next->prev = Q->prev;
                }
                if (Q == L.last) {
                    L.last = Q->prev;
                }
                Q = Q->next;
                delete duplicate;
            } else {
                Q = Q->next;
            }
        }
```

```
        P = P->next;
    }
}
```

- dll_32.h

```
/*
Nama: Arzario Irsyad Al Fatih
NIM: 2211104032
Kelas: SE 07 02
*/
#ifndef LIST_H
#define LIST_H

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

struct Mahasiswa {
    string nama;
    int NIM;
    string kelas;
    float nilaiAsesmen;
    float nilaiPraktikum;
};

typedef Mahasiswa infotype;
typedef struct Elemen* address;

struct Elemen {
    infotype info;
    address next;
    address prev;
};

struct List {
    address first;
    address last;
};

void createNewList(List &L);
bool isEmpty(List L);
address newElement(infotype data);
void printList(List L);
void insertLast(List &L, address P);
void removeDuplicateNIM(List &L);
void printHighestAsesmen(List L);

#endif
```

2. Output

```
PS C:\Users\toshiba\Documents\Tugas Kuliah\Semester 5\Praktikum\PPB_Arzario_Irsyad_Al_Fatih_22
PS C:\Users\toshiba\Documents\Tugas Kuliah\Semester 5\Praktikum\PPB_Arzario_Irsyad_Al_Fatih_22
Masukkan jumlah mahasiswa: 3
Masukkan Nama: Rio
Masukkan NIM: 032
Masukkan Kelas: SE-7-2
Masukkan Nilai Asesmen: 100
Masukkan Nilai Praktikum: 100
Masukkan Nama: Ariq
Masukkan NIM: 033
Masukkan Kelas: SE-7-2
Masukkan Nilai Asesmen: 95
Masukkan Nilai Praktikum: 95
Masukkan Nama: Fauzan
Masukkan NIM: 033
Masukkan Kelas: SE-7-2
Masukkan Nilai Asesmen: 90
Masukkan Nilai Praktikum: 90
Data Mahasiswa:
Nama: Rio, NIM: 32, Kelas: SE-7-2, Nilai Asesmen: 100, Nilai Praktikum: 100
Nama: Ariq, NIM: 33, Kelas: SE-7-2, Nilai Asesmen: 95, Nilai Praktikum: 95
Nama: Fauzan, NIM: 33, Kelas: SE-7-2, Nilai Asesmen: 90, Nilai Praktikum: 90
Mahasiswa dengan Nilai Asesmen Tertinggi:
Nama: Rio, NIM: 32, Kelas: SE-7-2, Nilai Asesmen: 100, Nilai Praktikum: 100
Data Mahasiswa setelah menghapus duplikat:
Nama: Rio, NIM: 32, Kelas: SE-7-2, Nilai Asesmen: 100, Nilai Praktikum: 100
Nama: Ariq, NIM: 33, Kelas: SE-7-2, Nilai Asesmen: 95, Nilai Praktikum: 95
```