STRUKTUR DATA

(Tugas3)

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NPM : 140810210059

Dikumpulkan tanggal :

6 Maret 2022

UNIVERSITAS PADJADJARAN

FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM

Program Studi INFORMATIKA

2022

```
/*  Nama Program    : Tugas3

    Nama            : Prames Ray Lapian
    NPM             : 140810210059
    Tanggal Buat    : 17 Mar 2022
    Deskripsi       : Membuat program untuk mencari rata - rata dan nilai
tertinggi, serta melakukan Insert First pada Singly Link List Mahasiswa
    Lokasi File     : C:\Users\prame\Documents\PRAMES\PERKULIAHAN\SEMESTER
2\Struktur Data\TUGAS
**********************************************/
#include <iostream>
using namespace std;

struct Mahasiswa
{
    char nama[30];
    char npm[12];
    int nilai;
    Mahasiswa *next;
};

typedef Mahasiswa* MahasiswaPtr;
typedef MahasiswaPtr Mhs;

void createMhs(MahasiswaPtr &pNew)
{
    pNew = new Mahasiswa;
    cout << "Nama   : "; cin >> pNew -> nama;
    cout << "NPM    : "; cin >> pNew -> npm;
    cout << "Nilai  : "; cin >> pNew -> nilai;
    pNew -> next = nullptr;
}

void insertFirst(Mhs &head, MahasiswaPtr pNew)
{
    cout << endl;
    if (head == nullptr)
    {
        head = pNew;
    }
    else
    {
        pNew -> next = head;
        head = pNew;
    }
}

void printMhs(Mhs &head)
{
```

```
    if (head == nullptr)
    {
        cout << "List kosong!\n";
    }
    else
    {
        MahasiswaPtr pHelp = head;

        while (pHelp != nullptr)
        {
            cout << pHelp -> npm << " | " << pHelp -> nama << " \t| " << pHelp
-> nilai << endl;
            pHelp = pHelp -> next;
        }

    }
}

void deleteList(Mhs &head)
{
    if (head == nullptr)
        return;

    MahasiswaPtr currentmhs = head;
    MahasiswaPtr nextmhs = nullptr;

    while (currentmhs != nullptr)
    {
        nextmhs = currentmhs -> next;
        delete currentmhs;
        currentmhs = nextmhs;
    }

    head = nullptr;
}

void rataRata(float &rata, Mhs &head)
{
    float jumlah = 0;
    int loop = 0;

    if (head == nullptr)
    {
        cout << "List kosong!\n";
    }
    else
    {
        MahasiswaPtr pHelp = head;
```

```
        while (pHelp != nullptr)
        {
            jumlah += pHelp -> nilai;
            pHelp = pHelp -> next;
            loop += 1;
        }

        rata = jumlah / loop;

        cout << "Rata - rata nilai : " << rata << endl;
    }
}

void nilaiMaksimal(float &maksimal, Mhs &head)
{
    if (head == nullptr)
    {
        cout << "List kosong!\n";
    }
    else
    {
        MahasiswaPtr pHelp = head;

        while (pHelp != nullptr)
        {
            if (pHelp -> nilai >= maksimal)
            {
                maksimal = pHelp -> nilai;
            }

            pHelp = pHelp -> next;
        }

        cout << "Maksimal nilai    : " << maksimal << endl;
    }
}

int main()
{
    Mhs list = nullptr;
    MahasiswaPtr mhsNew;
    float ratarata, maksimal;
    char option;

    do
    {
        createMhs(mhsNew);
```

```
        insertFirst(list, mhsNew);
        cout << "Apakah masih ingin mendata? y/n : "; cin >> option;
    }
    while (option == 'Y' || option == 'y');

    printMhs(list);

    cout << endl;
    rataRata(ratarata, list);
    nilaiMaksimal(maksimal, list);

    deleteList(list);
}
```

Output Program: