**STRUKTUR DATA**

(Tugas3)

****

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Dikumpulkan tanggal :

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UNIVERSITAS PADJADJARAN

FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM

Program Studi INFORMATIKA

2022

/\*  Nama Program    : Tugas3

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    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

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#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:

