STRUKTUR DATA

(UTS)

Nama : Prames Ray Lapian

NPM : 140810210059

Dikumpulkan tanggal :

3 April 2022

UNIVERSITAS PADJADJARAN

FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM

Program Studi INFORMATIKA

2022

1. Soal 1:

```
/*  Nama Program    : 210059_UTSStrukDat_Soal1
    Nama            : Prames Ray Lapian
    NPM             : 140810210059
    Tanggal Buat    : 10 April 2022
    Deskripsi       : Soal 1 UTS
    Lokasi File     : C:\Users\prame\Documents\PRAMES\PERKULIAHAN\SEMESTER
2\Struktur Data\TUGAS
**********************************************/

#include <iostream>
using namespace std;

typedef int Larik[15];

void inputBanyakData(int& n)
{
    cout << "Input banyak data : "; cin >> n;
}

void inputData(Larik& data, int n)
{
    for (int i = 0; i < n; i++)
    {
        cout << "\nMasukan data mahasiswa ke- " << (i+1) << endl
             << "Nilai : "; cin >> data[i];
    }
}

void cetakData(Larik data, int n)
{
    cout << "=========" << endl
         << "  DATA   " << endl
         << "=========" << endl;

    for (int i = 0; i < n; i++)
    {
        cout << data[i] << endl;
    }
}

int deleteLarik(Larik& data, int& n, int key, int status)
{
    status = 0;
    cout << "Data yang ingin dihapus : "; cin >> key; cin.ignore();

    for (int i = 0; i < n; i++)
    {
```

```
        if (data[i] == key)
        {
            status = 1;
            data[i] = data[i + 1];
            n -= 1;
            cout << "Data berhasil dihapus" << endl;
            break;
        }
        else if (i == n)
        {
            cout << "Data tidak ditemukan" << endl;
            break;
        }
    }
    return 0;
}

int main()
{
    Larik data;
    int n, key, help;
    inputBanyakData(n);
    inputData(data, n);
    cetakData(data, n);

    deleteLarik(data, n, key, help);

    cetakData(data, n);

}
```

```
Input banyak data : 5

Masukan data mahasiswa ke- 1
Nilai : 90

Masukan data mahasiswa ke- 2
Nilai : 85

Masukan data mahasiswa ke- 3
Nilai : 80

Masukan data mahasiswa ke- 4
Nilai : 75

Masukan data mahasiswa ke- 5
Nilai : 70
=========
  DATA
=========
90
85
80
75
70
Data yang ingin dihapus : 80
Data berhasil dihapus
=========
  DATA
=========
90
85
75
75
```

2. Soal 2:

```
/*  Nama Program    : 210059_UTSStrukDat_Soal2
    Nama            : Prames Ray Lapian
    NPM             : 140810210059
    Tanggal Buat    : 10 April 2022
    Deskripsi       : Soal 2 UTS
    Lokasi File     : C:\Users\prame\Documents\PRAMES\PERKULIAHAN\SEMESTER
2\Struktur Data\TUGAS
**********************************************/

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

struct Mahasiswa
{
```

```
    string nama;
    string npm;
    float nilai;
    Mahasiswa *next;
};

struct Node
{
    Mahasiswa info;
    Node *next;
};

typedef Node* pointer;
typedef pointer List;

void createElement(pointer &pBaru)
{
    pBaru = new Node;
    cout << "Nama   : "; cin >> pBaru -> info.nama; cin.ignore();
    cout << "NPM    : "; cin >> pBaru -> info.npm; cin.ignore();
    cout << "Nilai  : "; cin >> pBaru -> info.nilai; cin.ignore();
    pBaru -> next = NULL;
}

void insertFirst(List &first, pointer pBaru)
{
    cout << endl;
    if (first == NULL)
    {
        first = pBaru;
    }
    else
    {
        pBaru -> next = first;
        first = pBaru;
    }
}

void rataRata(float &rata, List &first)
{
    float jumlah = 0;
    int loop = 0;

    if (first == NULL)
    {
        cout << "List kosong!\n";
    }
    else
```

```
    {
        pointer pBantu = first;

        do
        {
            jumlah += pBantu -> info.nilai;
            pBantu = pBantu -> next;
            loop += 1;
        }
        while (pBantu != NULL);

        rata = jumlah / loop;

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

char nilaiMutu(float nilai)
{
    char nilaiMutu;

    if (nilai >= 80 && nilai <= 100)
    {
        nilaiMutu = 'A';
    }
    else if (nilai >= 68 && nilai <= 80)
    {
        nilaiMutu = 'B';
    }
    else if (nilai >= 55 && nilai <= 68)
    {
        nilaiMutu = 'C';
    }
    else if (nilai >= 45 && nilai <= 55)
    {
        nilaiMutu = 'D';
    }
    else if (nilai >= 0 && nilai <= 45)
    {
        nilaiMutu = 'E';
    }

    return nilaiMutu;
}

string kelulusan(char nilaiMutu)
{
    string status;
```

```
    if (nilaiMutu == 'A' || nilaiMutu == 'B' || nilaiMutu == 'C')
    {
        status = "lulus";
    }
    else
    {
        status = "tidak lulus";
    }

    return status;
}

void traversal(List first, int number)
{
    if (first == NULL)
    {
        cout << "\nList kosong!" << endl;
    }
    else
    {
        pointer pBantu = first;

        cout << endl;
        cout << "-----------------------------------------------------------------
------------" << endl;
        cout << setw(5) << "NO" << setw(10) << "NPM" << setw(30) << "NAMA"  <<
setw(10) << "NILAI" << setw(5) << "HM" << setw(10) << "STATUS" << endl;
        cout << "-----------------------------------------------------------------
------------" << endl;

        do
        {
            cout << setw(5) << number << setw(10) << pBantu -> info.npm <<
setw(30) << pBantu -> info.nama  << setw(10) << pBantu -> info.nilai <<
setw(5) << nilaiMutu(pBantu -> info.nilai) << setw(10)  <<
kelulusan(nilaiMutu(pBantu -> info.nilai)) << endl;

            number += 1;
            pBantu = pBantu -> next;
        }
        while (pBantu != NULL);
        cout << "-----------------------------------------------------------------
------------" << endl;
    }
}

int main()
```

```
{
    List first = NULL;
    pointer pBaru;
    float rata;
    int number = 1;
    bool program = true;
    int opsi;

    while (program)
    {
        createElement(pBaru);
        insertFirst(first, pBaru);

        cout << "\nIngin terus menggunakan program?" << endl
             << "1.YA                              " << endl
             << "2.TIDAK                           " << endl
             << "Pilihan\t: "; cin >> opsi; cin.ignore();

        if (opsi == 1)
        {
            program = true;
        }
        else if (opsi == 2)
        {
            program = false;
            cout << "\nTerima kasih!" << endl;
        }
        else
        {
            program = false;
            cout << "\nPilihan Tidak Tersedia" << endl;
        }
    }

    traversal(first, number);
    rataRata(rata, first);


}
```

```
Nama    : Prames
NPM     : 001
Nilai   : 90


Ingin terus menggunakan program?
1.YA
2.TIDAK
Pilihan : 1
Nama    : Ray
NPM     : 002
Nilai   : 80


Ingin terus menggunakan program?
1.YA
2.TIDAK
Pilihan : 1
Nama    : Lapian
NPM     : 003
Nilai   : 70


Ingin terus menggunakan program?
1.YA
2.TIDAK
Pilihan : 2

Terima kasih!

-------------------------------------------------------------------------
   NO       NPM                          NAMA     NILAI   HM    STATUS
-------------------------------------------------------------------------
    1       003                        Lapian        70    B     lulus
    2       002                           Ray        80    A     lulus
    3       001                        Prames        90    A     lulus
-------------------------------------------------------------------------
Rata - rata nilai : 80
```

3. Soal 3:

```
/*  Nama Program    : 210059_UTSStrukDat_Soal3
    Nama            : Prames Ray Lapian
    NPM             : 140810210059
    Tanggal Buat    : 10 April 2022
    Deskripsi       : Soal 3 UTS
    Lokasi File     : C:\Users\prame\Documents\PRAMES\PERKULIAHAN\SEMESTER
2\Struktur Data\TUGAS
**********************************************/

#include<iostream>
```

```cpp
#include <iomanip>
using namespace std;

struct pegawai
{
    int NIP;
    char nama[30];
    int gol;
};

struct node
{
    node *next;
    node *prev;
    pegawai info;
};

typedef node* pointer;
typedef pointer List;

void createElement(pointer &pBaru)
{
    pBaru = new node;
    cout << "Nama     : "; cin.get(pBaru -> info.nama, 30); cin.ignore();
    cout << "NIP      : "; cin >> pBaru -> info.NIP;
    cout << "Golongan : "; cin >> pBaru -> info.gol;

    pBaru -> next = NULL;
    pBaru -> prev = NULL;
}

void search(List& first, int& key)
{
    if (first != NULL)
    {
        cout << "Masukkan NIP yang dicari : "; cin >> key; cin.ignore();
    }
    else
    {
        key = 0;
    }
}

void linearSearch(List &first, pointer &pCari, int key, pointer& pBantu)
{
    pCari = first;

    while (pCari != NULL)
```

```
    {
        if (pCari -> info.NIP == key)
        {
            break;
        }

        pBantu = pCari;
        pCari = pCari -> next;
    }
}

void insertBefore(List& first, pointer pCari, pointer pBantu, pointer pBaru)
{
    if (first == NULL)
    {
        first = pBaru;
    }
    else if (pCari == first)
    {
        pBaru -> next = first;
        first -> prev = pBaru;
        pBaru -> prev = NULL;
        first = pBaru;
    }
    else
    {
        pBantu -> next = pBaru;
        pBaru -> prev = pBantu;
        pCari -> prev = pBaru;
        pBaru -> next = pCari;
    }
}

void golGaji(int k)
{
    int gaji;

    if(k == 1)
    {
        gaji = 1000000;
    }
    else if(k == 2)
    {
        gaji = 2000000;
    }
    else if(k == 3)
    {
        gaji = 3000000;
```

```
    }
    cout << setw(15) << gaji;
}

void traversal(pointer first)
{
    if (first == NULL)
    {
        cout << "list kosong" << endl;
    }
    else
    {
        pointer pBantu = first;

        while (pBantu->next != NULL)
        {
            pBantu = pBantu->next;
        }

        cout << setw(5) << "NO" << setw(10) << "NIP" << setw(20) << "NAMA" <<
setw(15) << "GOLONGAN" << setw(15) << "GAJI" << endl;
        int number = 1;

        while (pBantu != NULL)
        {
            cout << setw(5) << number << setw(10) << pBantu->info.NIP <<
setw(20) << pBantu->info.nama << setw(15) << pBantu->info.gol;
            golGaji(pBantu->info.gol);
            cout << endl;

            pBantu = pBantu->prev;
            number++;
        }
    }
}

void edit(pointer pCari)
{
    cout << "nama baru : "; cin.get(pCari->info.nama, 30); cin.ignore();
    cout << "golongan baru : "; cin >> pCari->info.gol;
}

void menu(int &opsi)
{
    cout << endl;
    cout << "========================" << endl
         << "      LIST PEGAWAI      " << endl
         << "========================" << endl
```

```
         << "1. Input data           " << endl
         << "2. Cetak data           " << endl
         << "3. Edit data            " << endl
         << "4. keluar               " << endl
         << "Pilihan : "; cin >> opsi; cin.ignore();
    cout << endl;
}

int main()
{
    List list = NULL;
    pointer pBaru, pHapus, pCari, pBantu;
    int nilai, opsi;

    program:
    menu(opsi);

    switch (opsi)
    {
        case 1 :
            search(list, nilai);
            linearSearch(list, pCari, nilai, pBantu);
            createElement(pBaru);
            insertBefore(list, pCari, pBantu, pBaru);
            goto program;
        break;

        case 2 :
            traversal(list);
            goto program;
        break;

        case 3 :
            search(list, nilai);
            linearSearch(list, pCari, nilai, pBantu);
            edit(pCari);
            goto program;
        break;

        default :
        break;
    }
}
```

```
========================
      LIST PEGAWAI
========================
1. Input data
2. Cetak data
3. Edit data
4. keluar
Pilihan : 1

Nama     : Prames
NIP      : 001
Golongan : 1

========================
      LIST PEGAWAI
========================
1. Input data
2. Cetak data
3. Edit data
4. keluar
Pilihan : 1

Masukkan NIP yang dicari : 001
Nama     : Ray
NIP      : 002
Golongan : 2

========================
      LIST PEGAWAI
========================
1. Input data
2. Cetak data
3. Edit data
4. keluar
Pilihan : 1

Masukkan NIP yang dicari : 002
Nama     : Lapian
NIP      : 003
Golongan : 3
```

```
========================
      LIST PEGAWAI
========================
1. Input data
2. Cetak data
3. Edit data
4. keluar
Pilihan : 2

   NO       NIP               NAMA       GOLONGAN           GAJI
    1         1             Prames              1        1000000
    2         2                Ray              2        2000000
    3         3             Lapian              3        3000000

========================
      LIST PEGAWAI
========================
1. Input data
2. Cetak data
3. Edit data
4. keluar
Pilihan : 3

Masukkan NIP yang dicari : 002
nama baru : Alam Ray
golongan baru : 3

========================
      LIST PEGAWAI
========================
1. Input data
2. Cetak data
3. Edit data
4. keluar
Pilihan : 2

   NO       NIP               NAMA       GOLONGAN           GAJI
    1         1             Prames              1        1000000
    2         2          Alam Ray               3        3000000
    3         3             Lapian              3        3000000

========================
      LIST PEGAWAI
========================
1. Input data
2. Cetak data
3. Edit data
4. keluar
Pilihan : 4
```