STRUKTUR DATA

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UNIVERSITAS PADJADJARAN

FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM

Program Studi INFORMATIKA

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1. Soal 2

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

const int maxElemen = 255;

struct Stack
{
    int isi[maxElemen];
    int TOP;
};

Stack S;

void createStack (Stack& S)
{
    S.TOP = -1;
}

void push (Stack& S, int elemenBaru)
{
    if (S.TOP == maxElemen-1)
    {
        cout <<"Stack Overflow" << endl;
    }
    else
    {
        S.TOP += 1;
        S.isi[S.TOP] = elemenBaru;
    }
}

void pop(Stack& S, int& elemenHsl)
{
    if (S.TOP < 0)
    {
        cout << "Stack Underflow " << endl;
    }
    else
    {
        elemenHsl= S.isi[S.TOP];
        S.TOP -= 1;
    }
}

void traversal(Stack& S)
{
    int idxBantu = S.TOP;
```

```
    while (idxBantu >= 0)
    {
        cout << "__" << endl
             << S.isi[idxBantu] << endl;
        idxBantu -= 1;
    }

}

void swap(int& a, int& b){
    int temp = a;
    a = b;
    b = temp;
}

void BubbleSort(Stack& S)
{
    for(int i=0; i<S.TOP-1; i++)
    {
        for(int j=0; j<S.TOP-i-1; j++)
        {
            if(S.isi[j]<S.isi[j+1])
            {
                swap(S.isi[j], S.isi[j+1]);
            }
        }
    }
}

main()
{
    Stack myTumpukan;
    int temp;

    cout << "PROGRAM STACK ARRAY" << endl;

    createStack(myTumpukan);

    push(myTumpukan, 6);
    push(myTumpukan, 9);
    push(myTumpukan, 8);
    push(myTumpukan, 10);
    push(myTumpukan, 1);

    cout << "\nSebelum Sort:" << endl;
    traversal(myTumpukan);
```

```
    cout << "\nSetelah Sort:" << endl;
    BubbleSort(myTumpukan);
    traversal(myTumpukan);
}
 PROGRAM STACK ARRAY

 Sebelum Sort:
 __
 1
 __
 10
 __
 8
 __
 9
 __
 6

 Setelah Sort:
 __
 1
 __
 6
 __
 8
 __
 9
 __
 10
```

2. Soal 3

```
#include <iostream>
#include <string.h>
#include <iomanip>
using namespace std;

struct Pegawai
{
    char Nama[30];
};

struct Node
{
    Pegawai info;
    Node* next;
    Node* prev;
};
```

```
typedef Node *pointer;
typedef pointer List;

void createElement(pointer& pBaru)
{
    pBaru = new Node;

    cout << "\nData pegawai yang ingin ditambahkan:" << endl;
    cout << "Nama   : "; cin.get(pBaru->info.Nama,30); cin.ignore();


    pBaru->next = NULL;
}

void insertFirst(List& first, pointer pBaru)
{
    if (first == NULL)
    {
        first = pBaru;
    }
    else
    {
        pointer pBantu = first;

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

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

void traversal(List first)
{
    if (first == NULL)
    {
        cout << "\nList kosong!" << endl;
    }
    else
    {
        pointer pBantu = first;
        cout << endl;
        cout << setw(30) << "NAMA" << endl;

        do
        {
```

```
            cout << setw(30) << pBantu->info.Nama << endl;

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

void sambungList(List& first1, List& first2)
{
    if (first1 == NULL)
    {
        first1 = first2;
    }
    else if (first2 == NULL)
    {
        first2 = first1;
    }
    else
    {
        pointer pBantu1 = first1;
        pointer pBantu2 = first2;

        while (pBantu1->next != NULL)
        {
            pBantu1 = pBantu1->next;
        }

        pBantu1->next = first2;
        pBantu2->prev = pBantu1;

    }
}

int main()
{
    List first1 = NULL, first2 = NULL;
    pointer pBaru;

    createElement(pBaru);
        insertFirst(first1, pBaru);
    createElement(pBaru);
        insertFirst(first1, pBaru);
    createElement(pBaru);
        insertFirst(first1, pBaru);

    createElement(pBaru);
        insertFirst(first2, pBaru);
```

```
    createElement(pBaru);
        insertFirst(first2, pBaru);
    createElement(pBaru);
        insertFirst(first2, pBaru);

    sambungList(first1, first2);

    cout << "List First 1:" << endl;
    traversal(first1);
    cout << "List First 2:" << endl;
    traversal(first2);
}
Data pegawai yang ingin ditambahkan:
Nama   : a

Data pegawai yang ingin ditambahkan:
Nama   : b

Data pegawai yang ingin ditambahkan:
Nama   : c

Data pegawai yang ingin ditambahkan:
Nama   : x

Data pegawai yang ingin ditambahkan:
Nama   : y

Data pegawai yang ingin ditambahkan:
Nama   : z
List First 1:

                        NAMA
                           a
                           b
                           c
                           x
                           y
                           z
List First 2:

                        NAMA
                           x
                           y
                           z
```

3. Soal 4

```
#include <iostream>
#include <iomanip>
#include <string.h>
```

```
using namespace std;

struct Karyawan
{
    char namaKar[50];
    Karyawan *nextKar;
};
struct NIP
{
    char NIPKar[20];
    Karyawan *firstNIP;
    NIP *nextNIP;
};
struct Divisi
{
    char divPeg[50];
    NIP *firstNIP;
    Divisi *nextDiv;
};
typedef Karyawan *pKaryawan;
typedef NIP *pNIP;
typedef Divisi *pDiv;
typedef pDiv List;


char menu()
{
    char opsi;
    cout << "====================================" << endl
         << "          MENU PROGRAM Divisi       " << endl
         << "====================================" << endl
         << "1. Input Set Data Divisi             " << endl
         << "2. Input Data Divisi                 " << endl
         << "3. Input Data NIP                     " << endl
         << "4. Input Data Karyawan                  " << endl
         << "5. Hapus Data Divisi                 " << endl
         << "6. Hapus Data NIP                     " << endl
         << "7. Hapus Data Karyawan                  " << endl
         << "8. Tampilkan Seluruh Data             " << endl
         << "0. Keluar Program                     " << endl
         << "====================================" << endl << endl
         << "opsi\t: "; cin >> opsi;
    return opsi;
}

void createList(List &first)
{
    first = NULL;
```

```
}

void createDivisi(pDiv &newDiv)
{
    newDiv = new Divisi;
    cout << "Nama Divisi : "; cin.getline(newDiv->divPeg, 50);
    newDiv->firstNIP = NULL;
    newDiv->nextDiv = NULL;
}

void createNIP(pNIP &newNIP)
{
    newNIP = new NIP;
    cout << "NIP : "; cin.getline(newNIP->NIPKar, 20);
    newNIP->firstNIP = NULL;
    newNIP->nextNIP = NULL;
}

void createKaryawan(pKaryawan &newKaryawan)
{
    newKaryawan = new Karyawan;
    cout << "Karyawan : "; cin.getline(newKaryawan->namaKar, 50);
    newKaryawan->nextKar = NULL;
}

void insertLastDivisi(List &first, pDiv newDiv)
{
    if (first == NULL)
    {
        first = newDiv;
    }
    else
    {
        pDiv last = first;

        while (last -> nextDiv != NULL)
        {
            last = last -> nextDiv;
        }

        last -> nextDiv = newDiv;
    }
}

void deleteFirstDivisi(List &first, pDiv &pDelete)
{
    if (first == NULL)
    {
```

```
        pDelete = NULL;
        cout << "List Divisi Kosong\n";
    }
    else if (first->nextDiv == NULL)
    {
        pDelete = first;
        first = NULL;
        cout << "Divisi " << pDelete->divPeg << " Berhasil Dihapus\n";
    }
    else
    {
        pDelete = first;
        first = first -> nextDiv;
        pDelete -> nextDiv = NULL;
        cout << "Divisi " << pDelete->divPeg << " Berhasil Dihapus\n";
    }
}

void linearSearchDivisi(List first, char key[], int &status, pDiv &pDivisi)
{
    status = 0;
    pDivisi = first;
    while (pDivisi != NULL && status == 0)
    {
        if (strcmp(pDivisi->divPeg, key) == 0)
        {
            status = 1;
        }
        else
        {
            pDivisi = pDivisi->nextDiv;
        }
    }
}

void linearSearchNIP(pDiv pDivisi, char key[], int &status, pNIP &pNIP)
{
    status = 0;
    pNIP = pDivisi->firstNIP;
    while (pNIP != NULL && status == 0)
    {
        if (strcmp(pNIP->NIPKar, key) == 0)
        {
            status = 1;
        }
        else
        {
            pNIP = pNIP->nextNIP;
```

```
        }
    }
}

void insertFirstNIP(pDiv pDivisi, pNIP newNIP)
{
    if (pDivisi->firstNIP == NULL)
    {
        pDivisi->firstNIP = newNIP;
    }
    else
    {
        newNIP->nextNIP = pDivisi->firstNIP;
        pDivisi->firstNIP = newNIP;
    }
}

void deleteFirstNIP(pDiv pDivisi, pNIP &pDelete)
{
    if (pDivisi->firstNIP == NULL)
    {
        pDelete = NULL;
        cout << "List NIP Kosong\n";
    }
    else if (pDivisi->firstNIP->nextNIP == NULL)
    {
        pDelete = pDivisi->firstNIP;
        pDivisi->firstNIP = NULL;
        cout << "NIP " << pDelete->NIPKar << " Berhasil Dihapus\n";
    }
    else
    {
        pDelete = pDivisi->firstNIP;
        pDivisi->firstNIP = pDivisi->firstNIP->nextNIP;
        pDelete->nextNIP = NULL;
        cout << "NIP " << pDelete->NIPKar << " Berhasil Dihapus\n";
    }
}

void insertFirstKar(pNIP pNIP, pKaryawan newKaryawan)
{
    if (pNIP->firstNIP == NULL)
    {
        pNIP->firstNIP = newKaryawan;
    }
    else
    {
        newKaryawan->nextKar = pNIP->firstNIP;
```

```
        pNIP->firstNIP = newKaryawan;
    }
}

void deleteFirstKar(pNIP pNIP, pKaryawan &pDelete)
{
    if (pNIP->firstNIP == NULL)
    {
        pDelete = NULL;
        cout << "List Karyawan Kosong\n";
    }
    else if (pNIP->firstNIP->nextKar == NULL)
    {
        pDelete = pNIP->firstNIP;
        pNIP->firstNIP = NULL;
        cout << "Karyawan " << pDelete->namaKar << " Berhasil Dihapus\n";
    }
    else
    {
        pDelete = pNIP->firstNIP;
        pNIP->firstNIP = pNIP->firstNIP->nextKar;
        pDelete->nextKar = NULL;
        cout << "Karyawan " << pDelete->namaKar << " Berhasil Dihapus\n";
    }
}

void traversalDivisi(List first)
{
    pDiv pDivisi = first;
    int no = 1;
    if (first == NULL)
    {
        cout << "List Divisi kosong" << endl;
    }
    else
    {
        cout <<
"================================================================================
==================\n";
        cout << setw(5) << "No" << setw(30) << "Nama Divisi" << setw(30) <<
"NIP" << setw(30) << "Karyawan" << endl;
        do
        {
            pNIP pNIP = pDivisi->firstNIP;
            cout << setw(5) << no;
            cout << setw(30) << pDivisi->divPeg;
            if (pNIP == NULL)
            {
```

```
            cout << setw(30) << "NIP kosong";
        }
        else
        {
            cout << setw(30) << pNIP->NIPKar;
            pKaryawan pKaryawan = pNIP->firstNIP;
            if (pKaryawan != NULL)
            {
                cout << setw(30) << pKaryawan->namaKar ;
                pKaryawan = pKaryawan->nextKar;
                while (pKaryawan != NULL)
                {
                    cout << endl;
                    cout << setw(95) << pKaryawan->namaKar;
                    pKaryawan = pKaryawan->nextKar;
                }
            }
            else
            {
                cout << setw(30) << "Karyawan kosong";
            }
            cout << endl;
            pNIP = pNIP->nextNIP;
            while (pNIP != NULL)
            {
                pKaryawan = pNIP->firstNIP;
                cout << setw(65) << pNIP->NIPKar;
                if (pKaryawan == NULL)
                {
                    cout << setw(30) << "Karyawan kosong" << endl;
                }
                else
                {
                    cout << setw(30) << pKaryawan->namaKar;
                    pKaryawan = pKaryawan->nextKar;
                    while (pKaryawan != NULL)
                    {
                        cout << endl;
                        cout << setw(95) << pKaryawan->namaKar;
                        pKaryawan = pKaryawan->nextKar;
                    }
                }
                pNIP = pNIP->nextNIP;
            }
        }
        cout << endl;
        no++;
        pDivisi = pDivisi->nextDiv;
```

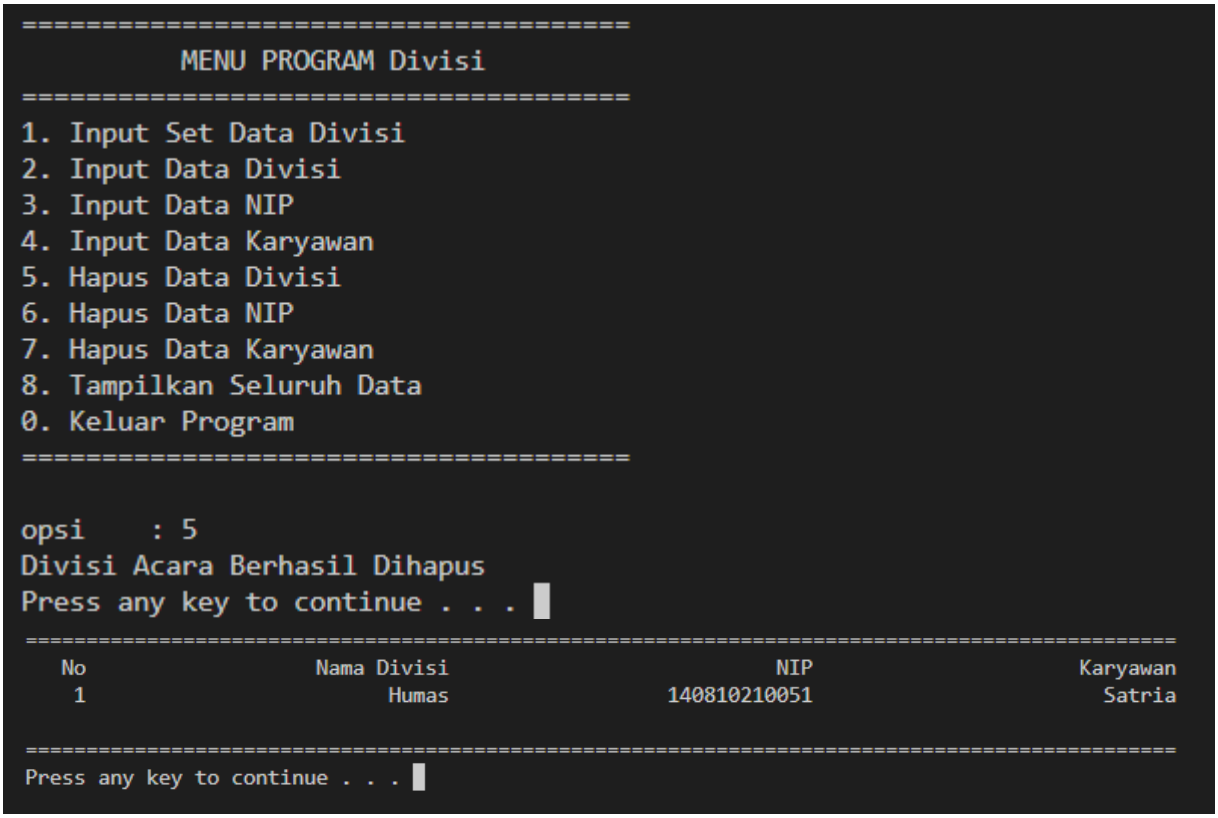
```
        }while (pDivisi != NULL);
        cout <<
"================================================================================
==================\n";
    }

}

int main()
{
    List listDivisi;
    pDiv pNewDivisi, pDeleteDivisi, pDivisi;
    pNIP pNewNIP, pDeleteNIP, pNIP;
    pKaryawan pNewKaryawan, pDeleteKaryawan;
    bool program = true;
    char opsi, key[50];
    int status;

    createList(listDivisi);

    while (program)
    {
        system("cls");
        opsi = menu();
        cin.ignore();

        switch (opsi)
        {
            case '1' :
                createDivisi(pNewDivisi);
                insertLastDivisi(listDivisi, pNewDivisi);
                    createNIP(pNewNIP);
                    insertFirstNIP(pNewDivisi, pNewNIP);
                        createKaryawan(pNewKaryawan);
                        insertFirstKar(pNewNIP, pNewKaryawan);

                cout << "Data berhasil ditambahkan" << endl;

                system("pause");
                break;

            case '2':
                createDivisi(pNewDivisi);
                insertLastDivisi(listDivisi, pNewDivisi);

                cout << "Divisi berhasil ditambahkan" << endl;

                system("pause");
```

```
            break;

        case '3':
            //cari Divisi
            cout << "Masukkan nama Divisi : "; cin.getline(key, 50);

            linearSearchDivisi(listDivisi, key, status, pDivisi);
            if (status == 1)
            {
                //tambahkan NIP
                createNIP(pNewNIP);
                insertFirstNIP(pDivisi, pNewNIP);
                cout << "NIP berhasil ditambahkan" << endl;
            }
            else
            {
                cout << "Divisi tidak ditemukan" << endl;
            }

            system("pause");
            break;

        case '4':
            //cari Divisi
            cout << "Masukkan nama Divisi : "; cin.getline(key, 50);

            linearSearchDivisi(listDivisi, key, status, pDivisi);
            if (status == 1)
            {
                //cari NIP
                cout << "Masukkan NIP : "; cin.getline(key, 20);

                linearSearchNIP(pDivisi, key, status, pNIP);
                if (status == 1)
                {
                    //tambah Karyawan
                    createKaryawan(pNewKaryawan);
                    insertFirstKar(pNIP, pNewKaryawan);

                    cout << "Karyawan berhasil ditambahkan" << endl;
                }
                else
                {
                    cout << "NIP tidak ditemukan" << endl;
                }
            }
            else
            {
```

```
            cout << "Divisi tidak ditemukan" << endl;
        }
        system("pause");
        break;

    case '5':
        //hapus Divisi
        deleteFirstDivisi(listDivisi, pDeleteDivisi);

        system("pause");
        break;

    case '6':
        //hapus NIP
        cout << "Masukkan nama Divisi : "; cin.getline(key, 50);

        linearSearchDivisi(listDivisi, key, status, pDivisi);
        if (status == 1)
        {
            deleteFirstNIP(pDivisi, pDeleteNIP);
        }
        else
        {
            cout << "Divisi tidak ditemukan" << endl;
        }

        system("pause");
        break;

    case '7':
        //hapus Karyawan
        cout << "Masukkan nama Divisi : "; cin.getline(key, 50);

        linearSearchDivisi(listDivisi, key, status, pDivisi);
        if (status == 1)
        {
            cout << "Masukkan NIP : "; cin.getline(key, 20);

            linearSearchNIP(pDivisi, key, status, pDeleteNIP);
            if (status == 1)
            {
                deleteFirstKar(pDeleteNIP, pDeleteKaryawan);
            }
            else
            {
                cout << "NIP tidak ditemukan" << endl;
            }
        }
```

```
                else
                {
                    cout << "Divisi tidak ditemukan" << endl;
                }
                system("pause");
                break;

            case '8':
                //traversal
                system("cls");

                traversalDivisi(listDivisi);

                system("pause");
                break;

            case '0':
                program = false;
                break;

            default :
                cout << "opsi tidak ada" << endl;
                system("pause");
                break;

        }
        cout << "Program Selesai Terima Kasih!\n";
    }
}
```

```
==========================================================================================
   No                 Nama Divisi                        NIP                    Karyawan
    1                       Acara               140810210059                      Prames

    2                       Humas               140810210051                      Satria

==========================================================================================
Press any key to continue . . .
```


MENU PROGRAM Divisi
1. Input Set Data Divisi
2. Input Data Divisi
3. Input Data NIP
4. Input Data Karyawan
5. Hapus Data Divisi
6. Hapus Data NIP
7. Hapus Data Karyawan
8. Tampilkan Seluruh Data
0. Keluar Program
opsi : 5
Divisi Acara Berhasil Dihapus
Press any key to continue . . .
No Nama Divisi NIP Karyawan
1 Humas 140810210051 Satria
Press any key to continue . . .