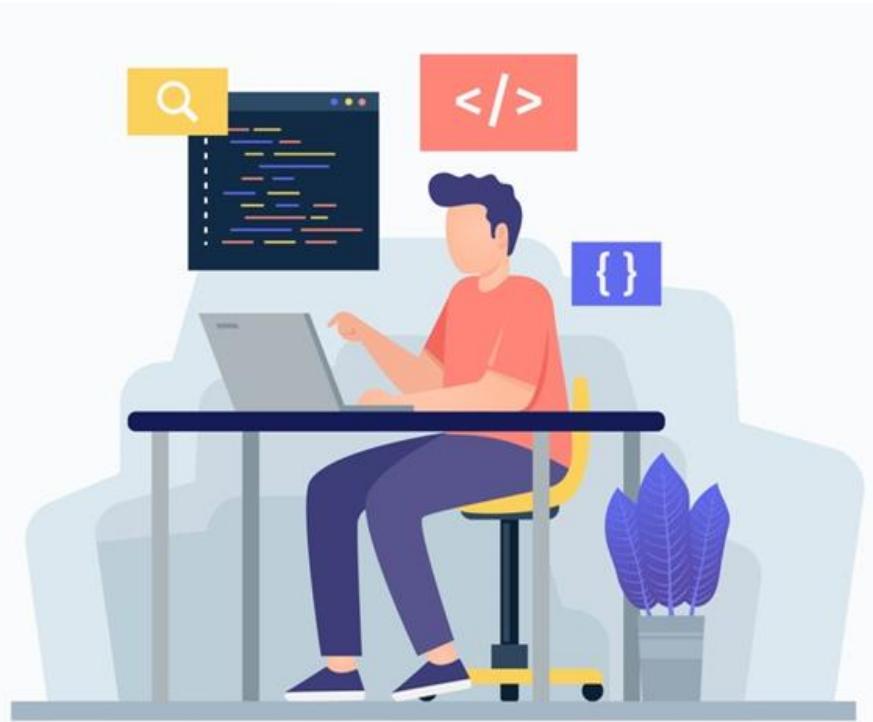




PROGRAM STUDI
TEKNIK INFORMATIKA
FAKULTAS ILMU KOMPUTER
UNIVERSITAS DIAN NUSWANTORO

Mata Kuliah
Dasar Pemrograman



Abstract Data Type (ADT)

TIM DASAR PEMROGRAMAN
TEKNIK INFORMATIKA S1
UNIVERSITAS DIAN NUSWANTORO

Capaian Pembelajaran

1. Menjelaskan konsep abstract data type
2. Merancang struct untuk merepresentasikan data organisasi dalam program prosedural
3. Merancang abstract data type dengan array dalam program
4. Merancang abstract data type dengan pointer dalam program

ADT Mahasiswa

```
#include <iostream>

using namespace std;

struct Mahasiswa{
    string nim;
    string nama;
    float ipk;
};

typedef struct Mahasiswa mhs;
```

```
int main()
{
    mhs Dilan;
    Dilan.nim = "A11.123"; Dilan.nama = "Dilan Ramadhan"; Dilan.ipk = 3.5;

    mhs dasPro[40]; //ADT Array
    dasPro[0].nim = "A11.124"; dasPro[0].nama = "Milea"; dasPro[0].ipk = 2;

    int i, n;
    cout << "Berapa mahasiswa yang ingin diinput? "; cin >> n;
    for(i=0; i<n; i++){ //INPUT
        cout << "Mahasiswa ke-" << i+1 << endl;
        cout << "Masukkan NIM = "; cin >> dasPro[i].nim;
        cout << "Masukkan Nama = "; cin >> dasPro[i].nama;
        cout << "Masukkan IPK = "; cin >> dasPro[i].ipk;
    }
    cout << endl;
    for(i=0; i<n; i++){ //OUTPUT
        cout << "Mahasiswa ke-" << i+1 << endl;
        cout << "NIM = " << dasPro[i].nim << endl;
        cout << "Nama = " << dasPro[i].nama << endl;
        cout << "IPK = " << dasPro[i].ipk << endl;
    }
    return 0;
}
```

ADT Mahasiswa langsung typedef

```
#include <iostream>

using namespace std;

typedef struct mahasiswa{
    string nim;
    string nama;
    float ipk;
}mhs;
```

Input Output Rapi (Dalam int main)

```
mhs dasPro[40];
int i, n;
cout << "Masukkan berapa mahasiswa yang akan diinput = ";
cin >> n;
for(i=0; i<n; i++){ //INPUT
    cout << "Mahasiswa ke-" << i+1 << endl;
    cout << "Masukkan NIM = ";
    cin >> dasPro[i].nim;
    cout << "Masukkan Nama = ";
    cin >> dasPro[i].nama;
    do{
        cout << "Masukkan IPK [0-4] = ";
        cin >> dasPro[i].ipk;
    }while(dasPro[i].ipk<0 || dasPro[i].ipk>4); //jika inputan di luar 0-4, maka looping lagi
}
cout << endl;

cout << "-----\n";
cout << "| No | NIM | Nama | IPK |\n";
cout << "-----\n";
for(i=0; i<n; i++){ //OUTPUT
    cout << "| " << i+1 << " | " << dasPro[i].nim << " | " << dasPro[i].nama << " | " << dasPro[i].ipk << " | " << endl;
}
cout << "-----\n";
```

```
Masukkan berapa mahasiswa yang akan diinput = 2
Mahasiswa ke-1
Masukkan NIM      = A11.123
Masukkan Nama     = Dilan
Masukkan IPK [0-4] = 5
Masukkan IPK [0-4] = 3.4
Mahasiswa ke-2
Masukkan NIM      = A12.124
Masukkan Nama     = Milea
Masukkan IPK [0-4] = 3.8
-----
| No | NIM      | Nama   | IPK |
-----
| 1  | A11.123  | Dilan  | 3.4 |
| 2  | A12.124  | Milea  | 3.8 |
```

Menu (Dalam int main)

```

int menu, iMin, iMax, urutan;
float maxx, minn, ipk_baru;
char lanjut;

do{
    cout << "Menu\n1. Tampil data\n2. Analisa\n3. Ganti IPK\nMasukkan pilihan menu : "; cin>> menu;
    if(menu==1){
        cout << "-----\n";
        cout << "| No | NIM | Nama | IPK |\n";
        cout << "-----\n";
        for(i=0; i<n; i++){ //OUTPUT
            cout << " | " << i+1 << " | " << dasPro[i].nim << " | " << dasPro[i].nama << " | " << dasPro[i].ipk << " | " << endl;
        }
        cout << "-----\n";
    }else if(menu==2){
        maxx=o; minn = 5;
        for(i=o; i<n; i++){
            if(dasPro[i].ipk > maxx){
                maxx = dasPro[i].ipk;
                iMax = i;
            }
            if(dasPro[i].ipk < minn){
                minn = dasPro[i].ipk;
                iMin = i;
            }
        }
        cout << "IPK tertinggi adalah " << maxx << " milik " << dasPro[iMax].nama << endl;
        cout << "IPK terendah adalah " << minn << " milik " << dasPro[iMin].nama << endl;
    }else if(menu==3){
        cout << "Apakah ingin lanjut (y/n)? ";
        cin >> lanjut;
    }
}

```

```

Menu
1. Tampil data
2. Analisa
3. Ganti IPK
Masukkan pilihan menu : 2
IPK tertinggi adalah 3.8 milik Milea
IPK terendah adalah 3.4 milik Dilan
Apakah ingin lanjut (y/n)? y
Menu
1. Tampil data
2. Analisa
3. Ganti IPK
Masukkan pilihan menu : 3
Masukkan urutan [1-2] : 1
IPK Dilan sebelumnya adalah 3.4
Masukkan IPK baru [0-4]: 3.9
Apakah ingin lanjut (y/n)? y
Apakah ingin lanjut (y/n)? n
Process returned 0 (0x0)   execution time

```

```

}else if(menu==3){
    do{
        cout << "Masukkan urutan [1- " << n << "]: ";
        cin >> urutan; //do while agar input 1-n
    }while(urutan<1 || urutan>n); //jika inputan di luar 1-n, maka looping lagi
    cout << "IPK " << dasPro[urutan-1].nama << " sebelumnya adalah " << dasPro[urutan-1].ipk << endl;
    do{
        cout << "Masukkan IPK baru [0-4]: ";
        cin >> ipk_baru; //do while agar input 0-4
    }while(ipk_baru<0 || ipk_baru>4); //jika inputan di luar 0-4, maka looping lagi
    dasPro[urutan-1].ipk = ipk_baru; //update IPK
    }else{
        cout << "Pilihan menu salah\n";
    }
    cout << "\nApakah ingin lanjut (y/n)? ";
    cin >> lanjut;
}while(lanjut=='y' || lanjut=='Y');

```

Referensi

Utama:

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TERIMA KASIH

ANY QUESTIONS?