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AJF
MODULE 4
Mylist.h

mylist.h | mylist.cpp | main.cpp

```
1  #ifndef MYLIST_H_INCLUDED
2  #define MYLIST_H_INCLUDED
3
4  #include <string>
5  #include <iostream>
6  #include <stdlib.h>
7  using namespace std;
8
9  #define info(P) (P)->info
10 #define next(P) (P)->next
11 #define first(L) ((L).first)
12
13 struct mahasiswa{
14     string nama;
15     string nim;
16     float ipk;
17 };
18
19 typedef mahasiswa infotype;
20 typedef struct elmList *adr;
21
22 struct elmList {
23     infotype info;
24     adr next;
25 };
26
27 struct List{
28     adr first;
29 };
30
31 void createList(List &L);
32 infotype newMahasiswa(string nama, string nim, float ipk);
33 adr newElement(infotype dataBaru);
34 void insertFirst(List &L, adr p);
35 void deleteFirst(List &L, adr p);
36 void printList(List L);
37 void insertLast(List &L, adr p);
38 void deleteLast(List &L, adr p);
39
40
41 #endif // MYLIST_H_INCLUDED
42
```

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MODULE 4
mylist.cpp

mylist.h | mylist.cpp | main.cpp

```cpp
#include "mylist.h"

void createList(List &L){
    first(L) = NULL;
}

infotype newMahasiswa(string nama, string nim, float ipk){
    mahasiswa mhs;

    mhs.nama = nama;
    mhs.nim = nim;
    mhs.ipk = ipk;

    return mhs;
}

adr newElement(infotype dataBaru){
    adr p = new elmList;

    info(p) = dataBaru;
    next(p) = NULL;
    return p;
}

void insertFirst(List &L, adr p){
    if (first(L) == NULL){
        first(L) = p;
    } else{
        next(p) = first(L);
        first(L) = p;
    }
}

void deleteFirst(List &L, adr p){
    p = first(L);
    if (next(first(L)) == NULL){
        first(L) = NULL;
    }else{
        first(L) = next(first(L));
    }
    next(p) = NULL;
}
```

mylist.h | mylist.cpp | main.cpp

```cpp
void printList(List L){
    adr p;
    int i;

    if (first(L) == NULL){
        cout << "List Kosong!" << endl;
        cout << endl;
    }else{
        i = 1;
        p = first(L);
        while (p != NULL){
            cout << "[" << i  << "]" << endl;
            cout << "Nama    : " << info(p).nama << endl;
            cout << "NIM     : " << info(p).nim << endl;
            cout << "IPK     : " << info(p).ipk << endl;
            p = next(p);
            i++;
        }
        cout << "List selesai ditampilkan!" << endl;
        cout << endl;
    }
}

void insertLast(List &L, adr p){
    adr last;
    if (first(L) == NULL){
        first(L) = p;
    } else{
        last = next(first(L));
        while (next(last)!=NULL){
            last = next(last);
        }
         next(last) = p;
    }
}
```

```cpp
void deleteLast(List &L, adr p){
    adr q;

    if (first(L) == NULL){
        p = NULL;
        cout << "List Kosong";
    } else if (next(first(L)) == NULL){
        p = first(L);
        first(L) = NULL;
    } else{
        q = first(L);
        p = first(L);
        while (next(p) != NULL){
            q = p;
            p = next(p);
        }
        next(q) = NULL;
    }
}
```

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MODULE 4
main.cpp

mylist.h | mylist.cpp | main.cpp

```cpp
#include "mylist.h"

int main()
{
    List L;
    adr P, temp;
    infotype Mhs;

    createList(L);
    printList(L);

    Mhs = newMahasiswa("Alice", "1301190202", 3.5);
    P = newElement(Mhs);
    insertFirst(L,P);

    Mhs = newMahasiswa("Bob", "1301190203", 4);
    P = newElement(Mhs);
    insertFirst(L,P);

    printList(L);

    Mhs = newMahasiswa("Chihaya", "1301190204", 3.6);
    P = newElement(Mhs);
    insertLast(L,P);

    Mhs = newMahasiswa("Delta", "1301190205", 2.7);
    P = newElement(Mhs);
    insertLast(L,P);

    Mhs = newMahasiswa("Euniche", "1301190201", 3.9);
    P = newElement(Mhs);
    insertFirst(L,P);

    printList(L);

    deleteFirst(L,temp);
    deleteLast(L,temp);

    printList(L);
```

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MODULE 4
Output:

```
"C:\Users\haikal\Documents\Kuliah\Semester 3\Strukdat\Module4\Module4\bin\Debug\Module4.exe"
List Kosong!

[1]
Nama    : Bob
NIM     : 1301190203
IPK     : 4
[2]
Nama    : Alice
NIM     : 1301190202
IPK     : 3.5
List selesai ditampilkan!

[1]
Nama    : Euniche
NIM     : 1301190201
IPK     : 3.9
[2]
Nama    : Bob
NIM     : 1301190203
IPK     : 4
[3]
Nama    : Alice
NIM     : 1301190202
IPK     : 3.5
[4]
Nama    : Chihaya
NIM     : 1301190204
IPK     : 3.6
[5]
Nama    : Delta
NIM     : 1301190205
IPK     : 2.7
List selesai ditampilkan!

[1]
Nama    : Bob
NIM     : 1301190203
IPK     : 4
[2]
Nama    : Alice
NIM     : 1301190202
IPK     : 3.5
[3]
Nama    : Chihaya
NIM     : 1301190204
IPK     : 3.6
List selesai ditampilkan!
```

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MODULE 4
Mandiri

1.

mylist.h | mylist.cpp | *main.cpp

```
40
41      cout << "Soal Mandiri" << endl;
42      //soal mandiri
43      //menerima inputan pertama
44      cout << "Nama    : ";
45      cin >> Mhs.nama;
46      cout << "NIM     : ";
47      cin >> Mhs.nim;
48      cout << "IPK     : ";
49      cin >> Mhs.ipk;
50      cout << endl;
51      //memasukkan kedalam SSL, NIM : 1301202398(Genap)
52      P = newElement(Mhs);
53      insertFirst(L,P);
54      //pengkondisian input
55      if (stoi(Mhs.nim) % 3 == 0){    //stoi untuk convert str to int
56          while (Mhs.nama != "-"){
57              cout << "Nama    : ";
58              cin >> Mhs.nama;
59              cout << "NIM     : ";
60              cin >> Mhs.nim;
61              cout << "IPK     : ";
62              cin >> Mhs.ipk;
63              cout << endl;
64              P = newElement(Mhs);
65              insertFirst(L,P);
66              cout << endl;
67              printList(L);
68              cout << endl;
69          }
70      }else if (stoi(Mhs.nim) % 3 == 1){
71          while (Mhs.nim != "-"){
72              cout << "Nama    : ";
73              cin >> Mhs.nama;
74              cout << "NIM     : ";
75              cin >> Mhs.nim;
76              cout << "IPK     : ";
77              cin >> Mhs.ipk;
78              cout << endl;
79              P = newElement(Mhs);
80              insertFirst(L,P);
81              cout << endl;
82              printList(L);
83              cout << endl;
79  }else if (stoi(Mhs.nim) % 3 == 2){
80      while (Mhs.nama != "-" && Mhs.nim == "-"){
81          cout << "Nama    : ";
82          cin >> Mhs.nama;
83          cout << "NIM     : ";
84          cin >> Mhs.nim;
85          cout << "IPK     : ";
86          cin >> Mhs.ipk;
87          cout << endl;
88          P = newElement(Mhs);
89          insertFirst(L,P);
90  }
```

```
Soal Mandiri
Nama    : Haikal
NIM     : 90
IPK     : 3.2

Nama    : -
NIM     : 123
IPK     : 3.1
```

```
Soal Mandiri
Nama    : Bayu
NIM     : 100
IPK     : 3.2

Nama    : Cecep
NIM     : -
IPK     : 3.1
```