

TP Module 4

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Kelas : IF-44-01

SLL.h

```
main.cpp x SLL.cpp x *SLL.h x
1  #ifndef SLL_H_INCLUDED
2  #define SLL_H_INCLUDED
3
4  #include <iostream>
5  using namespace std;
6
7  #define info(P) (P)->info
8  #define next(P) (P)->next
9  #define first(MH) ((MH).first)
10
11  //NIM : 1301202398
12  typedef char infotype;
13  typedef struct element *adr;
14
15  struct element {          //adr == Node, head == MH
16      infotype info;
17      adr next;
18  };
19
20  struct List{
21      adr first;
22  };
23
24  // 1301202398 % 4 = 2
25  // Muhamad Fachri Haikal = MH
26  void createList(List &MH); //Procedure Create_list(in/out L : List)
27  adr newElement(infotype x); // Procedure newElement(in x : infotype, out p : adr)
28  void insertFirst(List &MH, adr p); // Procedure insertFirst(in/out L : List, in p : adr)
29  void show(List MH); // Procedure show(in L : List)
30  adr deleteLast(List &MH); //Procedure DeleteLast(In/Out L : List)
31  adr deleteFirst(List &MH); //TUGAS TP (1301202398 % 4 = 2)
32  #endif // SLL_H_INCLUDED
33
```

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SLL.cpp

```
main.cpp X SLL.cpp X *SLL.h X
1  #include "SLL.h"
2
3  void createList(List &MH){
4      first(MH) = NULL;
5  }
6
7  adr newElement(infotype x){
8      adr p = new element;
9
10     info(p) = x;
11     next(p) = NULL;
12     return p;
13 }
14
15 void insertFirst(List &MH, adr p){
16     if (first(MH) == NULL){
17         first(MH) = p;
18     } else{
19         next(p) = first(MH);
20         first(MH) = p;
21     }
22 }
23
24 void show(List MH){
25     adr p;
26
27     if (first(MH) != NULL){
28         p = first(MH);
29         while (p != NULL){
30             cout << info(p) << " ";
31             p = next(p);
32         }
33         cout << endl;
34     } else{
35         cout << "List Kosong" << endl;
36     }
37 }
38
39 adr deleteLast(List &MH){
40     adr p, q;
41
42     if (first(MH) == NULL){
43         p = NULL;
44         cout << "List Kosong";
45     } else if (next(first(MH)) == NULL){
46         p = first(MH);
47         first(MH) = NULL;
48     } else{
49         q = first(MH);
50         p = first(MH);
51         while (next(p) != NULL){
52             q = p;
53             p = next(p);
54         }
55         next(q) = NULL;
56     }
57     return p;
58 }
59
60 adr deleteFirst(List &MH){
61     adr p, temp;
62
63     temp = next(first(MH));
64     p = first(MH);
65     first(MH) = NULL;
66     first(MH) = temp;
67     return p;
68 }
69
```

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main.cpp

```
main.cpp x SLL.cpp x *SLL.h x
1  #include "SLL.h"
2  using namespace std;
3
4  int main()
5  {
6      List MH;
7      //test createList
8      cout << "first(MH) sebelum createList: " << first(MH) << endl;
9      createList(MH);
10     cout << "first(MH) setelah createList: " << first(MH) << endl;
11     cout << endl;
12
13     //test newElement
14     adr p;
15     p = newElement('C');
16     cout << "Info p: " << info(p) << endl;
17     cout << "Next p: " << next(p) << endl;
18     cout << endl;
19
20     //test insertFirst
21     cout << "first(MH) sebelum insertFirst: " << first(MH) << endl;
22     insertFirst(MH, p);
23     cout << "first(MH) setelah insertFirst: " << first(MH) << endl;
24     cout << "info first(MH): " << info(first(MH)) << endl;
25
26     p = newElement('T');
27     insertFirst(MH, p);
28     cout << "info first(MH): " << info(first(MH)) << endl;
29
30     p = newElement('X');
31     insertFirst(MH, p);
32     cout << "info first(MH): " << info(first(MH)) << endl;
33
34     p = newElement('S');
35     insertFirst(MH, p);
36     cout << "info first(MH): " << info(first(MH)) << endl;
37
38     p = newElement('A');
39     insertFirst(MH, p);
40     cout << "info first(MH): " << info(first(MH)) << endl;
41
42     p = newElement('B');
43     insertFirst(MH, p);
44     cout << "info first(MH): " << info(first(MH)) << endl;
45     cout << endl;
46
47     //test show
48     cout << "Output list: " << endl;
49     show(MH);
50     cout << endl;
51
52     //deleteLast
53     p = deleteLast(MH);
54     show(MH);
55     cout << "Last element yang terhapus: " << info(p) << endl;
56     cout << endl;
57
58     p = deleteLast(MH);
59     show(MH);
60     cout << "Last element yang terhapus: " << info(p) << endl;
61     cout << endl;
62
63     p = deleteLast(MH);
64     show(MH);
65     cout << "Last element yang terhapus: " << info(p) << endl;
66     cout << endl;
67
68     //deleteFirst
69     p = deleteFirst(MH);
70     show(MH);
71     cout << "First element yang terhapus: " << info(p) << endl;
72     return 0;
73 }
74
```

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Hasil output:

```
"C:\Users\haikal\Documents\Kuliah\Semester 3\Strukdat\TP4\TP4\bin\Debug\TP4.exe"
first(MH) sebelum createList: 0x4021bb
first(MH) setelah createList: 0

Info p: C
Next p: 0

first(MH) sebelum insertFirst: 0
first(MH) setelah insertFirst: 0xf31490
info first(MH): C
info first(MH): T
info first(MH): X
info first(MH): S
info first(MH): A
info first(MH): B

Output list:
B A S X T C

B A S X T
Last element yang terhapus: C

B A S X
Last element yang terhapus: T

B A S
Last element yang terhapus: X

A S
First element yang terhapus: B
```