



source\_1301194054.cpp

```
1  #include "header_1301194054.h"
2  using namespace std;
3  /* Nama: Fahmi Razan Ramdani
4  NIM: 1301194054 */
5
6  void buatList(List &L){
7      first(L) = NULL;
8      last(L) = NULL;
9  }
10
11  bool listKosong(List L){
12      bool found;
13      if(first(L) == NULL && last(L) == NULL){
14          found = true;
15          return found;
16      } else{
17          return found;
18      }
19  }
20
21  address cariElemen(List L, string x){
22      address P;
23      bool found;
24      P = first(L);
25      while(info(P).penerbit != x && !found && P != last(L)){
26          P = next(P);
27          if(info(P).penerbit == x){
28              found = true;
29          }
30      }
31      if(info(P).penerbit == x){
32          found = true;
33          return P;
34      }
35  }
36
37  void buatElemen(address &P, string ID, string judul, string pengarang, string penerbit, string tahun){
38      P = new elmList;
39      info(P).ID = ID;
40      info(P).judul = judul;
41      info(P).pengarang = pengarang;
42      info(P).penerbit = penerbit;
43      info(P).tahun = tahun;
44  }
45
46
47  void tambahDataTerakhir(List &L, address P){
48      address Q;
49      if(first(L) == NULL && last(L) == NULL){
50          first(L) = P;
51          last(L) = P;
52      } else{
53          Q = last(L);
54          next(Q) = P;
55          last(L) = P;
56      }
57  }
58
59  void lihatList(List L){
60      address P = first(L);
61      while(P != NULL){
62          cout<<info(P).ID<<" " <<info(P).judul<<" " <<info(P).pengarang<<"\n";
63          P = next(P);
64      }
65      cout<<endl;
66  }
67
68  void tambahDataSetelah(List &L, address Prec, address P){
69      next(P) = next(Prec);
70      next(Prec) = P;
```



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```
39     info(P).ID = ID;
40     info(P).judul = judul;
41     info(P).pengarang = pengarang;
42     info(P).penerbit = penerbit;
43     info(P).tahun = tahun;
44 }
45
46
47 void tambahDataTerakhir(List &L, address P){
48     address Q;
49     if(first(L) == NULL && last(L) == NULL){
50         first(L) = P;
51         last(L) = P;
52     } else{
53         Q = last(L);
54         next(Q) = P;
55         last(L) = P;
56     }
57 }
58
59 void lihatList(List L){
60     address P = first(L);
61     while(P != NULL){
62         cout<<info(P).ID<<" " <<info(P).judul<<" " <<info(P).pengarang<<"\n";
63         P = next(P);
64     }
65     cout<<endl;
66 }
67
68 void tambahDataSetelah(List &L, address Prec, address P){
69     next(P) = next(Prec);
70     next(Prec) = P;
71 }
72
73 void hapusDataTerakhir(List &L, address &P){
74     address Q;
75     if(last(L) != NULL){
76         if(first(L) == last(L)){
77             P = first(L);
78             delete P;
79         } else{
80             Q = first(L);
81             while(next(Q) != last(L)){
82                 Q = next(Q);
83             }
84             P = last(L);
85             last(L) = Q;
86             delete P;
87         }
88     }
89 }
90
91 int jumBuku(List L, int x){
92     address P;
93     int jumlah;
94     P = first(L);
95     jumlah = 0;
96     while(P != last(L)){
97         if(info(P).tahun < x){
98             jumlah++;
99         } else{
100             P = next(P);
101         }
102     }
103     if(info(P).tahun < x){
104         jumlah++;
105     }
106     return jumlah;
107 }
108
```

```
header_1301194054.h x main.cpp x source_1301194054.cpp x
4  /* Nama: Fahmi Raza Ramdani
5  NIM: 1301194054 */
6  int main()
7  {
8      List L;
9      infotype a;
10     int i, data, z, sama, tahun, cari;;
11     address ad, adbaru;
12     buatList(L);
13
14     i = 0;
15     z = 1;
16     cout<<"Fahmi Raza Ramdani"<<endl;
17     cout<<"1301194054"<<endl;
18     cout<<"Masukan banyak buku: ";
19     cin>>data;
20     buatList(L);
21     while(i<data){
22         cout<<"Buku ke-"<<z++<<" : \n";
23         cout<<"ID: ";
24         cin>>a.ID;
25         cout<<"Judul: ";
26         cin>>a.judul;
27         cout<<"Pengarang: ";
28         cin>>a.pengarang;
29         cout<<"Penerbit: ";
30         cin>>a.penerbit;
31         cout<<"Tahun: ";
32         cin>>a.tahun;
33         buatElemen(ad, a.ID, a.judul, a.pengarang, a.penerbit, a.tahun);
34         tambahDataTerakhir(L, ad);
35         i++;
36         cout<<endl;
37     }
38     lihatList(L);
39     cout<<endl;
40
41     string tanya;
42     cout<<"Ingin buat elemen insert?(yes/no): ";
43     cin>>tanya;
44     if(tanya == "yes" || tanya == "Yes"){
45         cout<<"Masukkan penerbit buku untuk insert after: ";
46         cin>>a.penerbit;
47         ad = cariElemen(L, a.penerbit);
48         if(a.penerbit != ""){
49             cout<<"Detail buku: "<<endl;
50             cout<<"ID: ";
51             cin>>a.ID;
52             cout<<"Judul: ";
53             cin>>a.judul;
54             cout<<"Pengarang: ";
55             cin>>a.pengarang;
56             cout<<"Penerbit: ";
57             cin>>a.penerbit;
58             cout<<"Tahun: ";
59             cin>>a.tahun;
60             buatElemen(adbaru, a.ID, a.judul, a.pengarang, a.penerbit, a.tahun);
61             tambahDataSetelah(L, ad, adbaru);
62             cout<<endl;
63         }
64     }
65     lihatList(L);
66
67     cout<<"Setelah data terakhir dihapus:\n";
68     hapusDataTerakhir(L, ad);
69     lihatList(L);
70     cout<<endl;
71
72     cout<<"Banyak data tahun yang dicari: ";
73     cin>>tahun;
74     i = 0;
75     sama = 0;
76     cari = 0;
77     while(i<tahun){
78         cout<<"Tahun yang dicari: ";
79         cin>>cari;
80         sama = jumBuku(L, cari);
81         cout<<sama;
82         i++;
83     }
```



```
header_1301194054.h x main.cpp x source_1301194054.cpp x
1  #ifndef HEADER_1301194054_H_INCLUDED
2  #define HEADER_1301194054_H_INCLUDED
3  #include <iostream>
4  #define first(L) L.first
5  #define last(L) L.last
6  #define next(P) P->next
7  #define info(P) P->info
8  using namespace std;
9  /* Nama: Fahmi Razan Ramdani
10   NIM: 1301194054 */
11
12 struct buku{
13     string ID, judul, pengarang, penerbit;
14     int tahun;
15 };
16
17 typedef buku infotype;
18 typedef struct elmlist *address;
19
20 struct elmlist{
21     infotype info;
22     address next;
23 };
24
25 struct List{
26     address first, last;
27 };
28
29 void buatList(List &L);
30 bool listKosong(List L);
31 address cariElemen(List L, string x);
32 void buatElemen(address &P, string ID, string judul, string pengarang, string penerbit);
33 void tambahDataTerakhir(List &L, address P);
34 void tambahDataSetelah(List &L, address Prec, address P);
35 void hapusDataTerakhir(List &L, address &P);
36 void lihatList(List L);
37 int jumBuku(List L, int tahun);
38 #endif // HEADER_1301194054_H_INCLUDED
39
```

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4  #define first(L) L.first
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6  #define next(P) P->next
7  #define info(P) P->info
8  using namespace std;
9  /* Nama: Fahmi Razan Ramdani
10   NIM: 1301194054 */
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12 struct buku{
13     string ID, judul, pengarang, penerbit;
14     int tahun;
15 };
16
17 typedef buku infotype;
18 typedef struct elmlist *address;
19
20 struct elmlist{
21     infotype info;
22     address next;
23 };
24
25 struct List{
26     address first, last;
27 };
28
29 void buatList(List &L);
30 bool listKosong(List L);
31 address cariElemen(List L, string x);
32 void buatElemen(address &P, string ID, string judul, string pengarang, string penerbit, int tahun);
33 void tambahDataTerakhir(List &L, address P);
34 void tambahDataSetelah(List &L, address Prec, address P);
35 void hapusDataTerakhir(List &L, address &P);
```

```
"D:\Fahmi\File Kuliah\Tingkat satu\Struktur Data\TP3\bi...
Fahmi Razan Ramdani
1301194054
Masukan banyak buku: 2
Buku ke-1:
ID: id01
Judul: buku1
Pengarang: anna
Penerbit: informatika
Tahun: 2017

Buku ke-2:
ID: id03
Judul: buku3
Pengarang: cikita
Penerbit: gramedia
Tahun: 2018

id01 buku1 anna
id03 buku3 cikita

Ingin buat elemen insert?(yes/no): yes
Masukkan penerbit buku untuk insert after: informatika
Detail buku:
ID: id02
Judul: buku2
Pengarang: bana
Penerbit: informatika
Tahun: 2018

id01 buku1 anna
id02 buku2 bana
id03 buku3 cikita

Setelah data terakhir dihapus:
id01 buku1 anna
id02 buku2 bana
id03 buku3 cikita
```