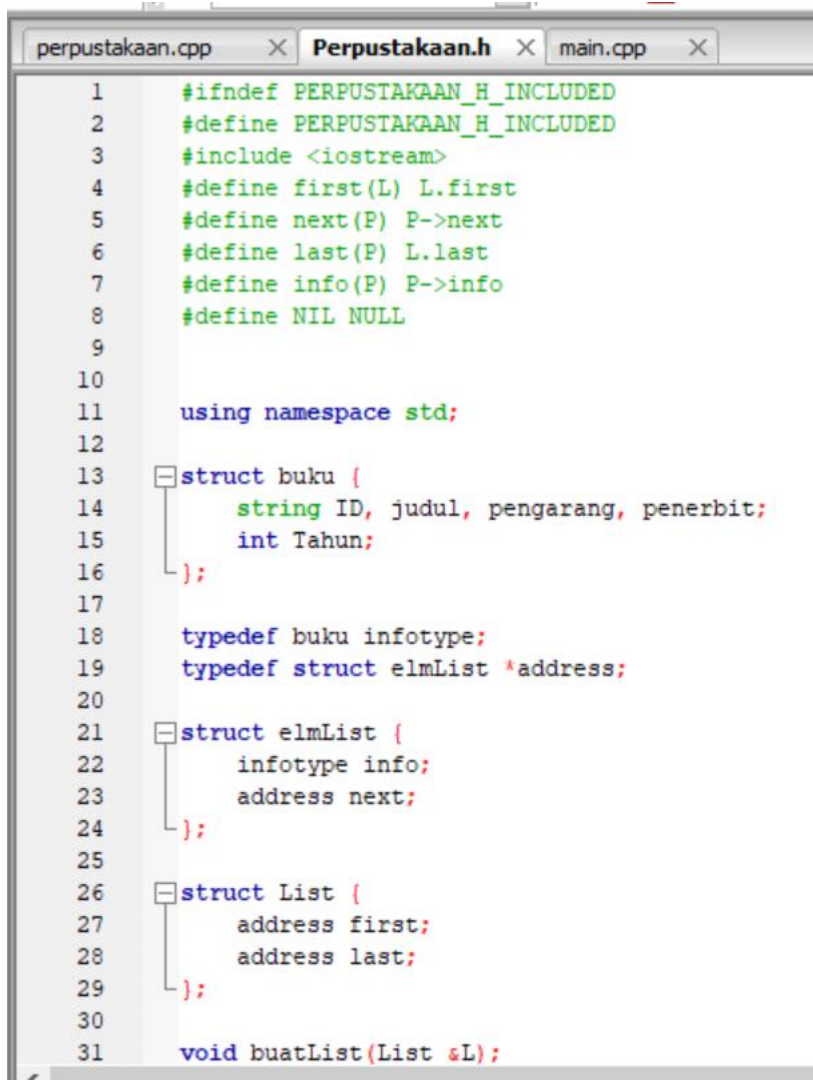


### TUGAS PENDAHULUAN 3

#### STRUKTUR DATA

Nama : Bagas Tri Wibowo  
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KELAS : IF-43-04

Header :



```
1  #ifndef PERPUSTAKAAN_H_INCLUDED
2  #define PERPUSTAKAAN_H_INCLUDED
3  #include <iostream>
4  #define first(L) L.first
5  #define next(P) P->next
6  #define last(P) L.last
7  #define info(P) P->info
8  #define NIL NULL
9
10
11  using namespace std;
12
13  struct buku {
14      string ID, judul, pengarang, penerbit;
15      int Tahun;
16  };
17
18  typedef buku infotype;
19  typedef struct elmList *address;
20
21  struct elmList {
22      infotype info;
23      address next;
24  };
25
26  struct List {
27      address first;
28      address last;
29  };
30
31  void buatList(List &L);
```

Implementation :

```
perpustakaan.cpp x Perpustakaan.h x main.cpp x
1  #include "Perpustakaan.h"
2
3  void buatList(List &L) {
4      first(L) = NIL;
5      last(L) = NIL;
6  }
7
8  bool listKosong(List L) {
9      if (first(L) == NIL) {
10         return true;
11     } else {
12         return false;
13     }
14 }
15
16 address cariElemen(List L, string X) {
17     address look = first(L);
18     bool found = false;
19     while (look != NIL && !found) {
20         if (info(look).penerbit == X) {
21             found = true;
22         } else {
23             look = next(look);
24         }
25     }
26     return look;
27 }
```

```
perpustakaan.cpp x Perpustakaan.h x main.cpp x
25 }
26 void buatElemen(address &P, string ID, string judul, string pengarang, string penerbit, int tahun) {
27     P = new elmList;
28     info(P).ID = ID;
29     info(P).judul = judul;
30     info(P).pengarang = pengarang;
31     info(P).penerbit = penerbit;
32     info(P).Tahun = tahun;
33     next(P) = NIL;
34 }
35 void tambahDataTerakhir(List &L, address P) {
36     if (listKosong(L) == false) {
37         next(last(L)) = P;
38         last(L) = P;
39     } else {
40         first(L) = P;
41         last(L) = P;
42     }
43 }
44 void tambahDataSetelah(List &L, address Prec, address P) {
45     next(P) = next(Prec);
46     next(Prec) = P;
47 }
48 void hapusDataTerakhir(List &L, address &P) {
49     P = last(L);
50     address Q = first(L);
51     while (next(next(Q)) != NIL) {
52         Q = next(Q);
53     }
54     last(L) = Q;
55     next(Q) = NIL;
56 }
```

```

57 void lihatList(List L) {
58
59     address Cetak = first(L);
60     while (Cetak != NIL) {
61         cout<<info(Cetak).ID<<" ";
62         cout<<info(Cetak).judul<<" ";
63         cout<<info(Cetak).pengarang;
64         cout<<endl;
65         Cetak = next(Cetak);
66     }
67     cout<<endl;
68 }
69 int jumBuku(List L, int thn) {
70     int i = 0;
71     address P = first(L);
72     while (P != NIL) {
73         if (info(P).Tahun <= thn) {
74             i = i + 1;
75         }
76         P = next(P);
77     }
78     return i;
79 }
80

```

Main Code :

```

perpustakaan.cpp x Perpustakaan.h x main.cpp x
1  #include "perpustakaan.cpp"
2
3  int main()
4  {
5      /**
6       *   NAMA    : BAGAS TRI WIBOWO
7       *   NIM     : 1301194051
8       */
9      List L;
10     address ad, adbaru;
11     buatList(L);
12
13     buatElemen(ad,"id01","buku1","anna","informatika",2017);
14     tambahDataTerakhir(L,ad);
15     buatElemen(ad,"id03","buku3","cikita","gramedia",2018);
16     tambahDataTerakhir(L,ad);
17     lihatList(L);
18
19     ad = cariElemen(L,"informatika");
20     buatElemen(adbaru,"id02","buku2","bana","informatika",2018);
21     tambahDataSetelah(L,ad,adbaru);
22     lihatList(L);
23     ad = cariElemen(L,"panerbit");
24     buatElemen(adbaru,"id05","buku5","wafa","informatika",2018);
25     lihatList(L);
26
27     hapusDataTerakhir(L,ad);
28     lihatList(L);
29
30     cout<<endl;
31     cout<<"Jumlah buku yang terbit sebelum tahun 2015 yaitu "<< jumBuku(L,2015) <<endl;
32     cout<<"Jumlah buku yang terbit sebelum tahun 2018 yaitu "<< jumBuku(L,2018) <<endl;
33     return 0;

```

Running Code :

```
id01    buku1    anna
id03    buku3    cikita

id01    buku1    anna
id02    buku2    bana
id03    buku3    cikita

id01    buku1    anna
id02    buku2    bana
id03    buku3    cikita

id01    buku1    anna
id02    buku2    bana

Jumlah buku yang terbit sebelum tahun 2015 yaitu 0
Jumlah buku yang terbit sebelum tahun 2018 yaitu 2

Process returned 0 (0x0)   execution time : 0.091 s
Press any key to continue.
```