

323.35

middle finder

CPP

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Due 12/10/20 6pm

Cover page

Source code

```
#include <iostream>
#include <fstream>
#include <string>
using namespace std;

class LLNode{
public:
    string data;
    LLNode* next;
    LLNode(string data){
        this->data = data;
        this->next = nullptr;
    }
    void printNode(ofstream& output){
        output<<data<<"->";
    }
};

class OrderedLL{
public:
    LLNode* dummy;

    OrderedLL(){
        dummy = new LLNode("dummy");
    }
    //inlist tobeinserted
    bool checkAlphabet(string data1, string data2){
        if(data1[0] > 64 && data1[0] < 91){
            data1[0] = data1[0] + 32;
        }
        if(data2[0] > 64 && data2[0] < 91){
            data2[0] = data2[0] + 32;
        }

        if(data1[0] < data2[0])
            return false;
        else if(data1[0] == data2[0]){
            int read = 1;
            while(read != data1.size() || read != data2.size()){
                if(data1[read] < data2[read])
                    return false;
                else
                    return true;
            }
        }
    }
};
```

```

        read++;
    }
    return false;
}
return true;
}

void insertNode(string data, ofstream& debug, LLNode** dummy){
    LLNode* insert = new LLNode(data);
    debug<<"Inserting data:"<<data<<endl;
    LLNode* head = *dummy;
    if(head->next == nullptr){
        head->next = insert;
    }
    else{
        while(head->next != nullptr){
            string info = head->next->data;
            if(this->checkAlphabet(head->next->data, data)){
                break;
            }
            head = head->next;
        }
        if(head->next == nullptr){
            head->next = insert;
        }
        else{
            insert->next = head->next;
            head->next = insert;
        }
    }
    debug<<"Printing list:\n";
    this->printList(debug, dummy);
}

void printList(ofstream& output, LLNode** dummy){
    LLNode* reader = *dummy;
    while(reader!=nullptr){
        reader->printNode(output);
        reader = reader->next;
    }
    output<<"NULL\n~~~~~\n";
}

string findMiddleNode(LLNode** dummy){
    LLNode* fast = *dummy;
    LLNode* slow = *dummy;
    while(fast->next != nullptr){

```

```

        fast = fast->next->next;
        slow = slow->next;
    }
    return slow->data;
}
};

int main(int argc, char* argv[]){
    ifstream inFile(argv[1]);
    ofstream outFile(argv[2]);
    ofstream debug(argv[3]);
    OrderedLL list;
    string data = "";
    while(inFile >> data){
        list.insertNode(data, debug, &list.dummy);
    }
    outFile<<"Printing Linked List\n";
    list.printList(outFile, &list.dummy);
    string middle = list.findMiddleNode(&list.dummy);
    outFile<<"Printing Middle\n"<<middle<<endl;
}

```

Output:

Printing Linked List

dummy->1863,->19,->a->a->Abraham->Address->after->afternoon->American->and->armies->
at->at->Battle->by->by->Cemetery->Civil->Confederacy->defeated->dedication->delivered->duri
ng->four->Gettysburg.->Gettysburg,->Gettysburg->half->in->is->It->Lincoln->Lincoln->months->
National->November->of->of->of->of->on->Pennsylvania,->President->speech->the->the->thos
e->the->the->the->Thursday,->the->the->The->U.S.->Union->War->was->NULL

~~~~~

Printing Middle

in

Debug

Inserting data:The

Printing list:

dummy->The->NULL

~~~~~

Inserting data:Gettysburg

Printing list:

dummy->Gettysburg->The->NULL

~~~~~

Inserting data:Address

Printing list:

dummy->Address->Gettysburg->The->NULL

~~~~~

Inserting data:is

Printing list:

dummy->Address->Gettysburg->is->The->NULL

~~~~~

Inserting data:a

Printing list:

dummy->a->Address->Gettysburg->is->The->NULL

~~~~~

Inserting data:speech

Printing list:

dummy->a->Address->Gettysburg->is->speech->The->NULL

~~~~~

Inserting data:by

Printing list:

dummy->a->Address->by->Gettysburg->is->speech->The->NULL

~~~~~

Inserting data:U.S.

Printing list:

dummy->a->Address->by->Gettysburg->is->speech->The->U.S.->NULL

~~~~~

Inserting data:President

Printing list:

dummy->a->Address->by->Gettysburg->is->President->speech->The->U.S.->NULL

~~~~~

Inserting data:Abraham

Printing list:

dummy->a->Abraham->Address->by->Gettysburg->is->President->speech->The->U.S.->NULL

~~~~~

Inserting data:Lincoln

Printing list:

dummy->a->Abraham->Address->by->Gettysburg->is->Lincoln->President->speech->The->U.S  
->NULL

~~~~~

Inserting data:It

Printing list:

dummy->a->Abraham->Address->by->Gettysburg->is->It->Lincoln->President->speech->The->
U.S->NULL

~~~~~

Inserting data:was

Printing list:

dummy->a->Abraham->Address->by->Gettysburg->is->It->Lincoln->President->speech->The->  
U.S->was->NULL

~~~~~

Inserting data:delivered

Printing list:

dummy->a->Abraham->Address->by->delivered->Gettysburg->is->It->Lincoln->President->spee
ch->The->U.S->was->NULL

~~~~~

Inserting data:by

Printing list:

dummy->a->Abraham->Address->by->by->delivered->Gettysburg->is->It->Lincoln->President->  
speech->The->U.S->was->NULL

~~~~~

Inserting data:Lincoln

Printing list:

dummy->a->Abraham->Address->by->by->delivered->Gettysburg->is->It->Lincoln->Lincoln->Pr
esident->speech->The->U.S->was->NULL

~~~~~

Inserting data:during

Printing list:

dummy->a->Abraham->Address->by->by->delivered->during->Gettysburg->is->It->Lincoln->Lin  
coln->President->speech->The->U.S->was->NULL

~~~~~

Inserting data:the

Printing list:

dummy->a->Abraham->Address->by->by->delivered->during->Gettysburg->is->It->Lincoln->Lin
coln->President->speech->the->The->U.S->was->NULL

~~~~~

Inserting data:American

Printing list:

dummy->a->Abraham->Address->American->by->by->delivered->during->Gettysburg->is->It->L  
incoln->Lincoln->President->speech->the->The->U.S->was->NULL

~~~~~

Inserting data:Civil

Printing list:

dummy->a->Abraham->Address->American->by->by->Civil->delivered->during->Gettysburg->is
->It->Lincoln->Lincoln->President->speech->the->The->U.S.->was->NULL

~~~~~

Inserting data:War

Printing list:

dummy->a->Abraham->Address->American->by->by->Civil->delivered->during->Gettysburg->is  
->It->Lincoln->Lincoln->President->speech->the->The->U.S.->War->was->NULL

~~~~~

Inserting data:on

Printing list:

dummy->a->Abraham->Address->American->by->by->Civil->delivered->during->Gettysburg->is
->It->Lincoln->Lincoln->on->President->speech->the->The->U.S.->War->was->NULL

~~~~~

Inserting data:the

Printing list:

dummy->a->Abraham->Address->American->by->by->Civil->delivered->during->Gettysburg->is  
->It->Lincoln->Lincoln->on->President->speech->the->the->The->U.S.->War->was->NULL

~~~~~

Inserting data:afternoon

Printing list:

dummy->a->Abraham->Address->afternoon->American->by->by->Civil->delivered->during->Get
tysburg->is->It->Lincoln->Lincoln->on->President->speech->the->the->The->U.S.->War->was->
NULL

~~~~~

Inserting data:of

Printing list:

dummy->a->Abraham->Address->afternoon->American->by->by->Civil->delivered->during->Get  
tysburg->is->It->Lincoln->Lincoln->of->on->President->speech->the->the->The->U.S.->War->w  
as->NULL

~~~~~

Inserting data:Thursday,

Printing list:

dummy->a->Abraham->Address->afternoon->American->by->by->Civil->delivered->during->Get
tysburg->is->It->Lincoln->Lincoln->of->on->President->speech->Thursday,->the->the->The->U.
S.->War->was->NULL

~~~~~

Inserting data:November

Printing list:

dummy->a->Abraham->Address->afternoon->American->by->by->Civil->delivered->during->Get  
tysburg->is->It->Lincoln->Lincoln->November->of->on->President->speech->Thursday,->the->t  
he->The->U.S.->War->was->NULL

~~~~~

Inserting data:19,

Printing list:

dummy->19,->a->Abraham->Address->afternoon->American->by->by->Civil->delivered->during
->Gettysburg->is->It->Lincoln->Lincoln->November->of->on->President->speech->Thursday,->t
he->the->The->U.S.->War->was->NULL

~~~~~

Inserting data:1863,

Printing list:

dummy->1863,->19,->a->Abraham->Address->afternoon->American->by->by->Civil->delivered-  
>during->Gettysburg->is->It->Lincoln->Lincoln->November->of->on->President->speech->Thurs  
day,->the->the->The->U.S.->War->was->NULL

~~~~~

Inserting data:at

Printing list:

dummy->1863,->19,->a->Abraham->Address->afternoon->American->at->by->by->Civil->delive
red->during->Gettysburg->is->It->Lincoln->Lincoln->November->of->on->President->speech->T
hursday,->the->the->The->U.S.->War->was->NULL

~~~~~

Inserting data:the

Printing list:

dummy->1863,->19,->a->Abraham->Address->afternoon->American->at->by->by->Civil->delive  
red->during->Gettysburg->is->It->Lincoln->Lincoln->November->of->on->President->speech->t  
he->Thursday,->the->the->The->U.S.->War->was->NULL

~~~~~

Inserting data:dedication

Printing list:

dummy->1863,->19,->a->Abraham->Address->afternoon->American->at->by->by->Civil->dedic
ation->delivered->during->Gettysburg->is->It->Lincoln->Lincoln->November->of->on->President
->speech->the->Thursday,->the->the->The->U.S.->War->was->NULL

~~~~~

Inserting data:of

Printing list:

dummy->1863,->19,->a->Abraham->Address->afternoon->American->at->by->by->Civil->dedic  
ation->delivered->during->Gettysburg->is->It->Lincoln->Lincoln->November->of->of->on->Presi  
dent->speech->the->Thursday,->the->the->The->U.S.->War->was->NULL

~~~~~

Inserting data:the

Printing list:

dummy->1863,->19,->a->Abraham->Address->afternoon->American->at->by->by->Civil->dedic
ation->delivered->during->Gettysburg->is->It->Lincoln->Lincoln->November->of->of->on->Presi
dent->speech->the->Thursday,->the->the->The->U.S.->War->was->NULL

~~~~~

Inserting data:National

Printing list:



dummy->1863,->19,->a->Abraham->Address->afternoon->American->at->by->by->Civil->dedication->delivered->during->Gettysburg->is->It->Lincoln->Lincoln->National->November->of->of->on->President->speech->the->the->Thursday,->the->the->The->U.S.->War->was->NULL

~~~~~

Inserting data:Cemetery

Printing list:

dummy->1863,->19,->a->Abraham->Address->afternoon->American->at->by->by->Cemetery->Civil->dedication->delivered->during->Gettysburg->is->It->Lincoln->Lincoln->National->November->of->of->on->President->speech->the->the->Thursday,->the->the->The->U.S.->War->was->NULL

~~~~~

Inserting data:in

Printing list:

dummy->1863,->19,->a->Abraham->Address->afternoon->American->at->by->by->Cemetery->Civil->dedication->delivered->during->Gettysburg->in->is->It->Lincoln->Lincoln->National->November->of->of->on->President->speech->the->the->Thursday,->the->the->The->U.S.->War->was->NULL

~~~~~

Inserting data:Gettysburg,

Printing list:

dummy->1863,->19,->a->Abraham->Address->afternoon->American->at->by->by->Cemetery->Civil->dedication->delivered->during->Gettysburg,->Gettysburg->in->is->It->Lincoln->Lincoln->National->November->of->of->on->President->speech->the->the->Thursday,->the->the->The->U.S.->War->was->NULL

~~~~~

Inserting data:Pennsylvania,

Printing list:

dummy->1863,->19,->a->Abraham->Address->afternoon->American->at->by->by->Cemetery->Civil->dedication->delivered->during->Gettysburg,->Gettysburg->in->is->It->Lincoln->Lincoln->National->November->of->of->on->Pennsylvania,->President->speech->the->the->Thursday,->the->the->The->U.S.->War->was->NULL

~~~~~

Inserting data:four

Printing list:

dummy->1863,->19,->a->Abraham->Address->afternoon->American->at->by->by->Cemetery->Civil->dedication->delivered->during->four->Gettysburg,->Gettysburg->in->is->It->Lincoln->Lincoln->National->November->of->of->on->Pennsylvania,->President->speech->the->the->Thursday,->the->the->The->U.S.->War->was->NULL

~~~~~

Inserting data:and

Printing list:

dummy->1863,->19,->a->Abraham->Address->afternoon->American->and->at->by->by->Cemetery->Civil->dedication->delivered->during->four->Gettysburg,->Gettysburg->in->is->It->Lincoln-

>Lincoln->National->November->of->of->on->Pennsylvania,->President->speech->the->the->Th  
ursday,->the->the->The->U.S.->War->was->NULL

~~~~~

Inserting data:a

Printing list:

dummy->1863,->19,->a->a->Abraham->Address->afternoon->American->and->at->by->by->Ce
metery->Civil->dedication->delivered->during->four->Gettysburg,->Gettysburg->in->is->It->Linc
oln->Lincoln->National->November->of->of->on->Pennsylvania,->President->speech->the->the-
>Thursday,->the->the->The->U.S.->War->was->NULL

~~~~~

Inserting data:half

Printing list:

dummy->1863,->19,->a->a->Abraham->Address->afternoon->American->and->at->by->by->Ce  
metery->Civil->dedication->delivered->during->four->Gettysburg,->Gettysburg->half->in->is->It-  
>Lincoln->Lincoln->National->November->of->of->on->Pennsylvania,->President->speech->the-  
>the->Thursday,->the->the->The->U.S.->War->was->NULL

~~~~~

Inserting data:months

Printing list:

dummy->1863,->19,->a->a->Abraham->Address->afternoon->American->and->at->by->by->Ce
metery->Civil->dedication->delivered->during->four->Gettysburg,->Gettysburg->half->in->is->It-
>Lincoln->Lincoln->months->National->November->of->of->on->Pennsylvania,->President->spe
ech->the->the->Thursday,->the->the->The->U.S.->War->was->NULL

~~~~~

Inserting data:after

Printing list:

dummy->1863,->19,->a->a->Abraham->Address->after->afternoon->American->and->at->by->b  
y->Cemetery->Civil->dedication->delivered->during->four->Gettysburg,->Gettysburg->half->in->  
is->It->Lincoln->Lincoln->months->National->November->of->of->on->Pennsylvania,->President  
->speech->the->the->Thursday,->the->the->The->U.S.->War->was->NULL

~~~~~

Inserting data:the

Printing list:

dummy->1863,->19,->a->a->Abraham->Address->after->afternoon->American->and->at->by->b
y->Cemetery->Civil->dedication->delivered->during->four->Gettysburg,->Gettysburg->half->in->
is->It->Lincoln->Lincoln->months->National->November->of->of->on->Pennsylvania,->President
->speech->the->the->the->Thursday,->the->the->The->U.S.->War->was->NULL

~~~~~

Inserting data:Union

Printing list:

dummy->1863,->19,->a->a->Abraham->Address->after->afternoon->American->and->at->by->b  
y->Cemetery->Civil->dedication->delivered->during->four->Gettysburg,->Gettysburg->half->in->  
is->It->Lincoln->Lincoln->months->National->November->of->of->on->Pennsylvania,->President  
->speech->the->the->the->Thursday,->the->the->The->U.S.->Union->War->was->NULL

~~~~~

Inserting data:armies

Printing list:

dummy->1863,->19,->a->a->Abraham->Address->after->afternoon->American->and->armies->
at->by->by->Cemetery->Civil->dedication->delivered->during->four->Gettysburg,->Gettysburg->
half->in->is->It->Lincoln->Lincoln->months->National->November->of->of->on->Pennsylvania,->
President->speech->the->the->the->Thursday,->the->the->The->U.S.->Union->War->was->NU
LL

~~~~~

Inserting data:defeated

Printing list:

dummy->1863,->19,->a->a->Abraham->Address->after->afternoon->American->and->armies->  
at->by->by->Cemetery->Civil->defeated->dedication->delivered->during->four->Gettysburg,->G  
ettysburg->half->in->is->It->Lincoln->Lincoln->months->National->November->of->of->on->Pen  
nsylvania,->President->speech->the->the->the->Thursday,->the->the->The->U.S.->Union->War  
->was->NULL

~~~~~

Inserting data:those

Printing list:

dummy->1863,->19,->a->a->Abraham->Address->after->afternoon->American->and->armies->
at->by->by->Cemetery->Civil->defeated->dedication->delivered->during->four->Gettysburg,->G
ettysburg->half->in->is->It->Lincoln->Lincoln->months->National->November->of->of->on->Pen
nsylvania,->President->speech->those->the->the->the->Thursday,->the->the->The->U.S.->Unio
n->War->was->NULL

~~~~~

Inserting data:of

Printing list:

dummy->1863,->19,->a->a->Abraham->Address->after->afternoon->American->and->armies->  
at->by->by->Cemetery->Civil->defeated->dedication->delivered->during->four->Gettysburg,->G  
ettysburg->half->in->is->It->Lincoln->Lincoln->months->National->November->of->of->of->on->  
Pennsylvania,->President->speech->those->the->the->the->Thursday,->the->the->The->U.S.->  
Union->War->was->NULL

~~~~~

Inserting data:the

Printing list:

dummy->1863,->19,->a->a->Abraham->Address->after->afternoon->American->and->armies->
at->by->by->Cemetery->Civil->defeated->dedication->delivered->during->four->Gettysburg,->G
ettysburg->half->in->is->It->Lincoln->Lincoln->months->National->November->of->of->of->on->
Pennsylvania,->President->speech->the->those->the->the->the->Thursday,->the->the->The->U
.S.->Union->War->was->NULL

~~~~~

Inserting data:Confederacy

Printing list:

dummy->1863,->19,->a->a->Abraham->Address->after->afternoon->American->and->armies->  
at->by->by->Cemetery->Civil->Confederacy->defeated->dedication->delivered->during->four->  
Gettysburg,->Gettysburg->half->in->is->It->Lincoln->Lincoln->months->National->November->of  
->of->of->on->Pennsylvania,->President->speech->the->those->the->the->the->Thursday,->the-  
>the->The->U.S.->Union->War->was->NULL

~~~~~

Inserting data:at

Printing list:

dummy->1863,->19,->a->a->Abraham->Address->after->afternoon->American->and->armies->
at->at->by->by->Cemetery->Civil->Confederacy->defeated->dedication->delivered->during->four->
Gettysburg,->Gettysburg->half->in->is->It->Lincoln->Lincoln->months->National->November->
of->of->of->on->Pennsylvania,->President->speech->the->those->the->the->the->Thursday,->t
he->the->The->U.S.->Union->War->was->NULL

~~~~~

Inserting data:the

Printing list:

dummy->1863,->19,->a->a->Abraham->Address->after->afternoon->American->and->armies->  
at->at->by->by->Cemetery->Civil->Confederacy->defeated->dedication->delivered->during->four->  
Gettysburg,->Gettysburg->half->in->is->It->Lincoln->Lincoln->months->National->November->  
of->of->of->on->Pennsylvania,->President->speech->the->the->those->the->the->the->Thursd  
ay,->the->the->The->U.S.->Union->War->was->NULL

~~~~~

Inserting data:Battle

Printing list:

dummy->1863,->19,->a->a->Abraham->Address->after->afternoon->American->and->armies->
at->at->Battle->by->by->Cemetery->Civil->Confederacy->defeated->dedication->delivered->dur
ing->four->Gettysburg,->Gettysburg->half->in->is->It->Lincoln->Lincoln->months->National->No
vember->of->of->of->on->Pennsylvania,->President->speech->the->the->those->the->the->the-
>Thursday,->the->the->The->U.S.->Union->War->was->NULL

~~~~~

Inserting data:of

Printing list:

dummy->1863,->19,->a->a->Abraham->Address->after->afternoon->American->and->armies->  
at->at->Battle->by->by->Cemetery->Civil->Confederacy->defeated->dedication->delivered->duri  
ng->four->Gettysburg,->Gettysburg->half->in->is->It->Lincoln->Lincoln->months->National->No  
vember->of->of->of->of->on->Pennsylvania,->President->speech->the->the->those->the->the->  
the->Thursday,->the->the->The->U.S.->Union->War->was->NULL

~~~~~

Inserting data:Gettysburg.

Printing list:

dummy->1863,->19,->a->a->Abraham->Address->after->afternoon->American->and->armies->
at->at->Battle->by->by->Cemetery->Civil->Confederacy->defeated->dedication->delivered->duri
ng->four->Gettysburg,->Gettysburg,->Gettysburg->half->in->is->It->Lincoln->Lincoln->months->

National->November->of->of->of->of->on->Pennsylvania,->President->speech->the->the->thos
e->the->the->the->Thursday,->the->the->The->U.S.->Union->War->was->NULL
~~~~~