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Project 7 (in C++): Linked-list ordered list (in ascending order)

Due: 04/29/2024

*****IV.main(...)*****

Step 0: inFile1, inFile2, outFile, deBugFileopen from argv [1], argv [2], argv [3], argv [4] Step 1: LLcreate a LLlist using constructor.

Step 2: buildList (LL, inFile1, outFile, deBugFile) Step 3: printList (LL, outFile, deBugFile)

Step 4: deleteList (LL, inFile2, outFile, deBugFile) Step 5: close all files

Source Code:

```
#include <iostream>

#include <fstream>


using namespace std;


class listNode {

public:

    int data;

    listNode* next;


    listNode(int dataIn, listNode* ptr) {

        data = dataIn;

        next = ptr;

    }

};


class LLlist {

public:

    listNode* listHead;


public:

    LLlist() {

        listHead = new listNode(-999, nullptr);
```

```

}

void printNode(listNode *node, ofstream &outFile)

{
    if(node!=nullptr && node->next!=nullptr){
        outFile << "(" << node->data << "," << node->next->data << ")" << endl;
        node = node->next;
    }
}

void buildList(LLlist& LL, ifstream& inFile1, ofstream& outFile, ofstream& debugFile) {
    debugFile<<"entering buildList () !"<<endl;
    debugFile<<"entering listInsert () !"<<endl;
    debugFile <<endl;
    int item;
    while(inFile1>>item){
        debugFile<<"In buildList () item ="<<item<<endl;
        listNode* newNode = new listNode(item, nullptr);
        listInsert(LL,newNode, debugFile);
        outFile<<"In buildList () printing list after insert newNode, item in newNode is:"<<item<<endl; //left
        printList(LL,outFile, debugFile);
    }
    debugFile<<"leaving buildList"<<endl;
    debugFile<<"entering listInsert () !";

    debugFile<<endl;

```

```
}
```

```
void listInsert(LLlist& LL, listNode* newNode, ofstream& debugFile){
```

```
    listNode*spot = findSpot (newNode, debugFile);
```

```
    newNode->next = spot->next;
```

```
    spot->next=newNode;
```

```
}
```

```
listNode*findSpot(listNode* newNode, ofstream& debugFile){
```

```
    debugFile<<"entering findSpot () ";
```

```
    listNode* Spot = listHead;
```

```
    while(Spot->next!=nullptr && Spot->next->data<newNode->data){
```

```
        Spot = Spot->next;
```

```
    }
```

```
    debugFile<<"leaving findSpot()!"<<endl;
```

```
    debugFile << endl;
```

```
    return Spot;
```

```
}
```

```
void listDelete(LLlist& LL, ifstream &inFile2, ofstream &outFile, ofstream &debugFile){
```

```
    debugFile<<"entering listDelete () !"<<endl;
```

```
    int item;
```

```
    while(inFile2>>item){
```

```

debugFile<<"In listDelete () item ="<<item<<endl;

listNode* junk = deleteOneNode(LL.listHead, item, debugFile);

if(junk!=nullptr){

    outFile<<endl;

    outFile<<"In listDelete (); data found and node is deleted"<<endl;

    outFile <<"In listDelete (): printing list after delete junk, item in the junk is "<< junk->data<<endl;

    printList(LL, outFile, debugFile);

}

outFile<< "item is not in the list"<<endl;

}

debugFile <<"leaving listdelete()"<<endl;

debugFile << endl;

}

```

```

listNode* deleteOneNode(listNode* listHead, int data, ofstream& debugFile) {

debugFile << "entering deleteOneNode () !" << endl;

listNode* Spot = listHead;

while(Spot->next != nullptr && Spot->next->data < data) {

    Spot = Spot->next;

}

if (Spot->next != nullptr && Spot->next->data == data) {

    listNode* tmp = Spot->next;

    Spot->next = tmp->next;

```

```

    tmp->next = nullptr;

    return tmp;

}

else{

return nullptr;

}

debugFile << "Leaving deleteOneNode (!)" << endl;

return 0;

}

void printList(LLlist &LL, ofstream &outFile, ofstream &debugFile){

listNode*current= listHead;

while (current->next != nullptr) {

    debugFile << "(" << current->data << ", " << current->next->data << ")→";

    current = current->next;

}

debugFile << "(" << current->data << ", NULL)" << endl;

debugFile<<endl;

}

};

int main(int argc, char* argv[]) {

    ifstream inFile1(argv[1]);

```

```
ifstream inFile2(argv[2]);  
  
ofstream outFile(argv[3]);  
  
ofstream deBugFile(argv[4]);
```

```
LLlist LL;
```

```
LL.buildList (LL, inFile1, outFile, deBugFile);  
  
LL.printList (LL, outFile, deBugFile);  
  
LL.listDelete (LL, inFile2, outFile, deBugFile);
```

```
inFile1.close();  
  
inFile2.close();  
  
outFile.close();  
  
deBugFile.close();  
  
return 0;
```

```
}
```

inDate1

838 91
32 333 888 999
79 444
702

deData1

58 327 955 349 325
307 111 222
613 777
637 255
838 91
32 333 888 999
79 444
702 95 588 12 16 666
88 192 40 555

outFile for Set1

In buildList () printing list after insert newNode, item in newNode is:838
In buildList () printing list after insert newNode, item in newNode is:91
In buildList () printing list after insert newNode, item in newNode is:32
In buildList () printing list after insert newNode, item in newNode is:333
In buildList () printing list after insert newNode, item in newNode is:888
In buildList () printing list after insert newNode, item in newNode is:999
In buildList () printing list after insert newNode, item in newNode is:79
In buildList () printing list after insert newNode, item in newNode is:444
In buildList () printing list after insert newNode, item in newNode is:702

In listDelete (); data fund and node is deleted
In listDelete (): printing list after delete junk, item in the junk is 838
item is not in the list
item is not in the list

In listDelete (); data fund and node is deleted
In listDelete (): printing list after delete junk, item in the junk is 333
item is not in the list

In listDelete (); data fund and node is deleted
In listDelete (): printing list after delete junk, item in the junk is 888
item is not in the list

In listDelete (); data fund and node is deleted
In listDelete (): printing list after delete junk, item in the junk is 79
item is not in the list

In listDelete (); data fund and node is deleted
In listDelete (): printing list after delete junk, item in the junk is 444
item is not in the list
item is not in the list

deBugFile from Set

entering buildList () !

entering listInsert () !

In buildList () item =838

entering findSpot () leaving findSpot()!

(-999, 838)→(838, NULL)

In buildList () item =91

entering findSpot () leaving findSpot()!

(-999, 91)→(91, 838)→(838, NULL)

In buildList () item =32

entering findSpot () leaving findSpot()!

(-999, 32)→(32, 91)→(91, 838)→(838, NULL)

In buildList () item =333

entering findSpot () leaving findSpot()!

(-999, 32)→(32, 91)→(91, 333)→(333, 838)→(838, NULL)

In buildList () item =888

entering findSpot () leaving findSpot()!

(-999, 32)→(32, 91)→(91, 333)→(333, 838)→(838, 888)→(888, NULL)

In buildList () item =999

entering findSpot () leaving findSpot()!

(-999, 32)→(32, 91)→(91, 333)→(333, 838)→(838, 888)→(888, 999)→(999, NULL)

In buildList () item =79

entering findSpot () leaving findSpot()!

(-999, 32)→(32, 79)→(79, 91)→(91, 333)→(333, 838)→(838, 888)→(888, 999)→(999, NULL)

In buildList () item =444

entering findSpot () leaving findSpot()!

(-999, 32)→(32, 79)→(79, 91)→(91, 333)→(333, 444)→(444, 838)→(838, 888)→(888, 999)→(999, NULL)

In buildList () item =702
entering findSpot () leaving findSpot()!

(-999, 32)→(32, 79)→(79, 91)→(91, 333)→(333, 444)→(444, 702)→(702, 838)→(838, 888)→(888, 999)→(999, NULL)

leaving buildList

entering listInsert () !

(-999, 32)→(32, 79)→(79, 91)→(91, 333)→(333, 444)→(444, 702)→(702, 838)→(838, 888)→(888, 999)→(999, NULL)

entering listDelete () !

In listDelete () item =838

entering deleteOneNode () !

(-999, 32)→(32, 79)→(79, 91)→(91, 333)→(333, 444)→(444, 702)→(702, 888)→(888, 999)→(999, NULL)

In listDelete () item =343

entering deleteOneNode () !

In listDelete () item =333

entering deleteOneNode () !

(-999, 32)→(32, 79)→(79, 91)→(91, 444)→(444, 702)→(702, 888)→(888, 999)→(999, NULL)

In listDelete () item =888

entering deleteOneNode () !

(-999, 32)→(32, 79)→(79, 91)→(91, 444)→(444, 702)→(702, 999)→(999, NULL)

In listDelete () item =79

entering deleteOneNode () !

(-999, 32)→(32, 91)→(91, 444)→(444, 702)→(702, 999)→(999, NULL)

In listDelete () item =444

entering deleteOneNode () !

(-999, 32)→(32, 91)→(91, 702)→(702, 999)→(999, NULL)

In listDelete () item =777

entering deleteOneNode () !

leaving listdelete()

inDate2

58 327 955 349 325
307 111 222
613 777
637 255
838 91
32 333 888 999
79 444
702 95 588 12 16 666
88 192 40 555

deData2

955 349
613 777
666 255
838 91
32 995
732

outFile from Set2

In buildList () printing list after insert newNode, item in newNode is:58
In buildList () printing list after insert newNode, item in newNode is:327
In buildList () printing list after insert newNode, item in newNode is:955
In buildList () printing list after insert newNode, item in newNode is:349
In buildList () printing list after insert newNode, item in newNode is:325
In buildList () printing list after insert newNode, item in newNode is:307
In buildList () printing list after insert newNode, item in newNode is:111
In buildList () printing list after insert newNode, item in newNode is:222
In buildList () printing list after insert newNode, item in newNode is:613
In buildList () printing list after insert newNode, item in newNode is:777
In buildList () printing list after insert newNode, item in newNode is:637
In buildList () printing list after insert newNode, item in newNode is:255
In buildList () printing list after insert newNode, item in newNode is:838
In buildList () printing list after insert newNode, item in newNode is:91
In buildList () printing list after insert newNode, item in newNode is:32
In buildList () printing list after insert newNode, item in newNode is:333
In buildList () printing list after insert newNode, item in newNode is:888
In buildList () printing list after insert newNode, item in newNode is:999
In buildList () printing list after insert newNode, item in newNode is:79
In buildList () printing list after insert newNode, item in newNode is:444
In buildList () printing list after insert newNode, item in newNode is:702
In buildList () printing list after insert newNode, item in newNode is:95
In buildList () printing list after insert newNode, item in newNode is:588

In buildList () printing list after insert newNode, item in newNode is:12

In buildList () printing list after insert newNode, item in newNode is:16

In buildList () printing list after insert newNode, item in newNode is:666

In buildList () printing list after insert newNode, item in newNode is:88

In buildList () printing list after insert newNode, item in newNode is:192

In buildList () printing list after insert newNode, item in newNode is:40

In buildList () printing list after insert newNode, item in newNode is:555

In listDelete (); data fund and node is deleted

In listDelete (): printing list after delete junk, item in the junk is 955

item is not in the list

In listDelete (); data fund and node is deleted

In listDelete (): printing list after delete junk, item in the junk is 349

item is not in the list

In listDelete (); data fund and node is deleted

In listDelete (): printing list after delete junk, item in the junk is 613

item is not in the list

In listDelete (); data fund and node is deleted

In listDelete (): printing list after delete junk, item in the junk is 777

item is not in the list

In listDelete (); data fund and node is deleted

In listDelete (): printing list after delete junk, item in the junk is 666

item is not in the list

In listDelete (); data fund and node is deleted

In listDelete (): printing list after delete junk, item in the junk is 255

item is not in the list

In listDelete (); data fund and node is deleted

In listDelete (): printing list after delete junk, item in the junk is 838

item is not in the list

In listDelete (); data fund and node is deleted

In listDelete (): printing list after delete junk, item in the junk is 91

item is not in the list

In listDelete (); data fund and node is deleted

In listDelete (): printing list after delete junk, item in the junk is 32

item is not in the list

item is not in the list

item is not in the list

deBugFile from Set2

entering buildList () !
entering listInsert () !

In buildList () item =58
entering findSpot () leaving findSpot()!

(-999, 58)→(58, NULL)

In buildList () item =327
entering findSpot () leaving findSpot()!

(-999, 58)→(58, 327)→(327, NULL)

In buildList () item =955
entering findSpot () leaving findSpot()!

(-999, 58)→(58, 327)→(327, 955)→(955, NULL)

In buildList () item =349
entering findSpot () leaving findSpot()!

(-999, 58)→(58, 327)→(327, 349)→(349, 955)→(955, NULL)

In buildList () item =325
entering findSpot () leaving findSpot()!

(-999, 58)→(58, 325)→(325, 327)→(327, 349)→(349, 955)→(955, NULL)

In buildList () item =307
entering findSpot () leaving findSpot()!

(-999, 58)→(58, 307)→(307, 325)→(325, 327)→(327, 349)→(349, 955)→(955, NULL)

In buildList () item =111
entering findSpot () leaving findSpot()!

(-999, 58)→(58, 111)→(111, 307)→(307, 325)→(325, 327)→(327, 349)→(349, 955)→(955, NULL)

In buildList () item =222
entering findSpot () leaving findSpot()!

(-999, 58)→(58, 111)→(111, 222)→(222, 307)→(307, 325)→(325, 327)→(327, 349)→(349, 955)→(955, NULL)

In buildList () item =613

entering findSpot () leaving findSpot()!

(-999, 58)→(58, 111)→(111, 222)→(222, 307)→(307, 325)→(325, 327)→(327, 349)→(349, 613)→(613, 955)→(955, NULL)

In buildList () item =777

entering findSpot () leaving findSpot()!

(-999, 58)→(58, 111)→(111, 222)→(222, 307)→(307, 325)→(325, 327)→(327, 349)→(349, 613)→(613, 777)→(777, 955)→(955, NULL)

In buildList () item =637

entering findSpot () leaving findSpot()!

(-999, 58)→(58, 111)→(111, 222)→(222, 307)→(307, 325)→(325, 327)→(327, 349)→(349, 613)→(613, 637)→(637, 777)→(777, 955)→(955, NULL)

In buildList () item =255

entering findSpot () leaving findSpot()!

(-999, 58)→(58, 111)→(111, 222)→(222, 255)→(255, 307)→(307, 325)→(325, 327)→(327, 349)→(349, 613)→(613, 637)→(637, 777)→(777, 955)→(955, NULL)

In buildList () item =838

entering findSpot () leaving findSpot()!

(-999, 58)→(58, 111)→(111, 222)→(222, 255)→(255, 307)→(307, 325)→(325, 327)→(327, 349)→(349, 613)→(613, 637)→(637, 777)→(777, 838)→(838, 955)→(955, NULL)

In buildList () item =91

entering findSpot () leaving findSpot()!

(-999, 58)→(58, 91)→(91, 111)→(111, 222)→(222, 255)→(255, 307)→(307, 325)→(325, 327)→(327, 349)→(349, 613)→(613, 637)→(637, 777)→(777, 838)→(838, 955)→(955, NULL)

In buildList () item =32

entering findSpot () leaving findSpot()!

(-999, 32)→(32, 58)→(58, 91)→(91, 111)→(111, 222)→(222, 255)→(255, 307)→(307, 325)→(325, 327)→(327, 349)→(349, 613)→(613, 637)→(637, 777)→(777, 838)→(838, 955)→(955, NULL)

In buildList () item =333
entering findSpot () leaving findSpot()!

(-999, 32)→(32, 58)→(58, 91)→(91, 111)→(111, 222)→(222, 255)→(255, 307)→(307, 325)→(325, 327)→(327, 333)→(333, 349)→(349, 613)→(613, 637)→(637, 777)→(777, 838)→(838, 955)→(955, NULL)

In buildList () item =888
entering findSpot () leaving findSpot()!

(-999, 32)→(32, 58)→(58, 91)→(91, 111)→(111, 222)→(222, 255)→(255, 307)→(307, 325)→(325, 327)→(327, 333)→(333, 349)→(349, 613)→(613, 637)→(637, 777)→(777, 838)→(838, 888)→(888, 955)→(955, NULL)

In buildList () item =999
entering findSpot () leaving findSpot()!

(-999, 32)→(32, 58)→(58, 91)→(91, 111)→(111, 222)→(222, 255)→(255, 307)→(307, 325)→(325, 327)→(327, 333)→(333, 349)→(349, 613)→(613, 637)→(637, 777)→(777, 838)→(838, 888)→(888, 955)→(955, 999)→(999, NULL)

In buildList () item =79
entering findSpot () leaving findSpot()!

(-999, 32)→(32, 58)→(58, 79)→(79, 91)→(91, 111)→(111, 222)→(222, 255)→(255, 307)→(307, 325)→(325, 327)→(327, 333)→(333, 349)→(349, 613)→(613, 637)→(637, 777)→(777, 838)→(838, 888)→(888, 955)→(955, 999)→(999, NULL)

In buildList () item =444
entering findSpot () leaving findSpot()!

(-999, 32)→(32, 58)→(58, 79)→(79, 91)→(91, 111)→(111, 222)→(222, 255)→(255, 307)→(307, 325)→(325, 327)→(327, 333)→(333, 349)→(349, 444)→(444, 613)→(613, 637)→(637, 777)→(777, 838)→(838, 888)→(888, 955)→(955, 999)→(999, NULL)

In buildList () item =702
entering findSpot () leaving findSpot()!

(-999, 32)→(32, 58)→(58, 79)→(79, 91)→(91, 111)→(111, 222)→(222, 255)→(255, 307)→(307, 325)→(325, 327)→(327, 333)→(333, 349)→(349, 444)→(444, 613)→(613, 637)→(637, 702)→(702, 777)→(777, 838)→(838, 888)→(888, 955)→(955, 999)→(999, NULL)

In buildList () item =95
entering findSpot () leaving findSpot()!

(-999, 32)→(32, 58)→(58, 79)→(79, 91)→(91, 95)→(95, 111)→(111, 222)→(222, 255)→(255, 307)→(307, 325)→(325, 327)→(327, 333)→(333, 349)→(349, 444)→(444, 613)→(613, 637)→(637, 702)→(702, 777)→(777, 838)→(838, 888)→(888, 955)→(955, 999)→(999, NULL)

In buildList () item =588
entering findSpot () leaving findSpot()!

(-999, 32)→(32, 58)→(58, 79)→(79, 91)→(91, 95)→(95, 111)→(111, 222)→(222, 255)→(255, 307)→(307, 325)→(325, 327)→(327, 333)→(333, 349)→(349, 444)→(444, 588)→(588, 613)→(613, 637)→(637, 702)→(702, 777)→(777, 838)→(838, 888)→(888, 955)→(955, 999)→(999, NULL)

In buildList () item =12
entering findSpot () leaving findSpot()!

(-999, 12)→(12, 32)→(32, 58)→(58, 79)→(79, 91)→(91, 95)→(95, 111)→(111, 222)→(222, 255)→(255, 307)→(307, 325)→(325, 327)→(327, 333)→(333, 349)→(349, 444)→(444, 588)→(588, 613)→(613, 637)→(637, 702)→(702, 777)→(777, 838)→(838, 888)→(888, 955)→(955, 999)→(999, NULL)

In buildList () item =16
entering findSpot () leaving findSpot()!

(-999, 12)→(12, 16)→(16, 32)→(32, 58)→(58, 79)→(79, 91)→(91, 95)→(95, 111)→(111, 222)→(222, 255)→(255, 307)→(307, 325)→(325, 327)→(327, 333)→(333, 349)→(349, 444)→(444, 588)→(588, 613)→(613, 637)→(637, 702)→(702, 777)→(777, 838)→(838, 888)→(888, 955)→(955, 999)→(999, NULL)

In buildList () item =666
entering findSpot () leaving findSpot()!

(-999, 12)→(12, 16)→(16, 32)→(32, 58)→(58, 79)→(79, 91)→(91, 95)→(95, 111)→(111, 222)→(222, 255)→(255, 307)→(307, 325)→(325, 327)→(327, 333)→(333, 349)→(349, 444)→(444, 588)→(588, 613)→(613, 637)→(637, 666)→(666, 702)→(702, 777)→(777, 838)→(838, 888)→(888, 955)→(955, 999)→(999, NULL)

In buildList () item =88
entering findSpot () leaving findSpot()!

(-999, 12)→(12, 16)→(16, 32)→(32, 58)→(58, 79)→(79, 88)→(88, 91)→(91, 95)→(95, 111)→(111, 222)→(222, 255)→(255, 307)→(307, 325)→(325, 327)→(327, 333)→(333, 349)→(349, 444)→(444, 588)→(588, 613)→(613, 637)→(637, 666)→(666, 702)→(702, 777)→(777, 838)→(838, 888)→(888, 955)→(955, 999)→(999, NULL)

In buildList () item =192
entering findSpot () leaving findSpot()!

(-999, 12)→(12, 16)→(16, 32)→(32, 58)→(58, 79)→(79, 88)→(88, 91)→(91, 95)→(95, 111)→(111, 192)→(192, 222)→(222, 255)→(255, 307)→(307, 325)→(325, 327)→(327, 333)→(333, 349)→(349, 444)→(444, 588)→(588,

613)→(613, 637)→(637, 666)→(666, 702)→(702, 777)→(777, 838)→(838, 888)→(888, 955)→(955, 999)→(999, NULL)

....

leaving listdelete()