

323.35

hash table

Java

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Source Code

```
import java.util.NoSuchElementException;
import java.util.Scanner;
import java.io.*;
import java.io.PrintStream;

public class FlammiaM_Q39_Java{
    public static void main(String args[])throws Exception{
        File data = new File(args[0]);
        HashTable hash = new HashTable();
        Scanner reader = new Scanner(data);
        PrintStream fileOut = new PrintStream(new FileOutputStream(args[2],true));
        System.setOut(fileOut);
        while(reader.hasNext()){
            String word = reader.next();
            hash.insert(word);
        }
        PrintStream finalOut = new PrintStream(new FileOutputStream(args[1],true));
        System.setOut(finalOut);
        hash.printTable();
    }
}

class LLNode{
    int count;
    LLNode next;
    String data;
    LLNode(){
        this.count = 1;
        this.data = "";
    }
    LLNode(String data){
        this.count = 1;
        this.data = data;
    }
    void printData(){
        if(this.count > 1){
            System.out.print(this.data + "(" + this.count + ")->");
        }
        else{
            System.out.print(this.data + "->");
        }
    }
}

class LinkedList{
```

```

LLNode head;
LinkedList(){
    this.head = new LLNode("dummy");
}
void insert(String data){
    LLNode newNode = new LLNode(data);
    LLNode reader = this.head;
    if(reader.next == null){
        reader.next = newNode;
    }
    else{
        while(reader.next!=null){
            if(reader.data.equals(data)){
                reader.count++;
                return;
            }
            reader = reader.next;
        }
        if(reader.data.equals(data)){
            reader.count++;
        }
        else{
            reader.next = newNode;
        }
    }
    System.out.println("Printing list after insert");
    this.printList();
}
void printList(){
    LLNode reader = this.head;
    while(reader.next != null){
        reader.printData();
        reader = reader.next;
    }
    System.out.println("NULL");
}
}
class HashTable{
    LinkedList[] hashTable;
    HashTable(){
        this.hashTable = new LinkedList[29];
        for(int i=0;i<29;i++){
            this.hashTable[i] = new LinkedList();
        }
    }
}

```

```

    }
    void insert(String data){
        int index = this.hashFunction(data);
        this.hashTable[index].insert(data);
    }
    int hashFunction(String data){
        int val = 1;
        for(int i=0;i<data.length();i++){
            val = val*32 + (int)data.charAt(i);
        }
        if(val < 0){
            val = val * -1;
        }
        return val%29;
    }
    void printTable(){
        System.out.println("Printing Table");
        for(int i=0;i<29;i++){
            System.out.print("Index " + i + ":");
            this.hashTable[i].printList();
        }
    }
}

```

Output:

Printing Table

Index 0:dummy->for(3)->dedicated->which->NULL

Index 1:dummy->history.(2)->NULL

Index 2:dummy->NULL

Index 3:dummy->that(6)->we(2)->National->NULL

Index 4:dummy->is(3)->NULL

Index 5:dummy->Address(2)->NULL

Index 6:dummy->known(2)->War,(2)->NULL

Index 7:dummy->The(2)->speech(2)->one(2)->here(2)->devotion(2)->NULL

Index 8:dummy->best(2)->government->Thursday,->armies->NULL

Index 9:dummy->President(2)->of(9)->earth.->NULL

Index 10:dummy->last->at(2)->NULL

Index 11:dummy->U.S.(2)->us(2)->from(2)->died->freedom->NULL

Index 12:dummy->rather->shall(3)->have(2)->vain->Gettysburg,->NULL

Index 13:dummy->a(4)->take->increased->NULL

Index 14:dummy->Civil(2)->task->gave->measure->NULL

Index 15:NULL

Index 16:dummy->Gettysburg(2)->Abraham(2)->before->not(2)->November->NULL

Index 17:dummy->Lincoln,(2)->great->remaining->honored->on->NULL
Index 18:dummy->by(5)->American(4)->nation,->NULL
Index 19:dummy->NULL
Index 20:dummy->they->afternoon->NULL
Index 21:dummy->NULL
Index 22:NULL
Index 23:dummy->resolve->NULL
Index 24:dummy->delivered(2)->highly->NULL
Index 25:dummy->It(3)->was(2)->NULL
Index 26:dummy->Lincoln(2)->cause->NULL
Index 27:dummy->be->these(2)->1863,->NULL
Index 28:dummy->in(4)->during(2)->NULL

Debug:

Printing list after insert
dummy->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->The->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->Gettysburg->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->The->speech->NULL
Printing list after insert
dummy->President->NULL
Printing list after insert
dummy->Address->NULL

Printing list after insert
dummy->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->by->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->It->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->in->NULL
Printing list after insert
dummy->Address->NULL
Printing list after insert
dummy->by(2)->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->known->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->U.S.->NULL
Printing list after insert
dummy->is(2)->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->The->speech->one->NULL
Printing list after insert
dummy->for->NULL

Printing list after insert
dummy->is(2)->NULL
Printing list after insert
dummy->Address->NULL
Printing list after insert
dummy->Lincoln,->NULL
Printing list after insert
dummy->Civil->NULL
Printing list after insert
dummy->Lincoln,->great->NULL
Printing list after insert
dummy->Gettysburg->Abraham->NULL
Printing list after insert
dummy->U.S.->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->U.S.->us(2)->NULL
Printing list after insert
dummy->be->NULL
Printing list after insert
dummy->Lincoln,->great->remaining->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->that->NULL
Printing list after insert
dummy->a->NULL
Printing list after insert
dummy->a->take->NULL
Printing list after insert
dummy->The->speech->one->here->NULL
Printing list after insert
dummy->is(2)->NULL
Printing list after insert
dummy->Lincoln->NULL
Printing list after insert
dummy->for(2)->dedicated->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->Civil->task->NULL
Printing list after insert
dummy->Address->NULL

Printing list after insert
dummy->NULL
Printing list after insert
dummy->in->during->NULL
Printing list after insert
dummy->Civil->task->gave->NULL
Printing list after insert
dummy->President->NULL
Printing list after insert
dummy->The->speech->one->here->NULL
Printing list after insert
dummy->that(3)->NULL
Printing list after insert
dummy->delivered->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->be->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->rather->NULL
Printing list after insert
dummy->Gettysburg->Abraham->before->NULL
Printing list after insert
dummy->rather->shall->NULL
Printing list after insert
dummy->U.S.->us(2)->from->NULL
Printing list after insert
dummy->rather->shall->have->NULL
Printing list after insert
dummy->Lincoln->cause->NULL
Printing list after insert
dummy->by(2)->American(2)->NULL
Printing list after insert
dummy->for(2)->dedicated->which->NULL
Printing list after insert
dummy->known->War,->NULL
Printing list after insert
dummy->by(2)->American(2)->nation,->NULL
Printing list after insert
dummy->delivered->highly->NULL
Printing list after insert
dummy->President->NULL

Printing list after insert
dummy->U.S.->us(2)->from->died->NULL
Printing list after insert
dummy->It(2)->was->NULL
Printing list after insert
dummy->best->NULL
Printing list after insert
dummy->President->NULL
Printing list after insert
dummy->Address->NULL
Printing list after insert
dummy->a(2)->take->increased->NULL
Printing list after insert
dummy->Address->NULL
Printing list after insert
dummy->a(2)->take->increased->NULL
Printing list after insert
dummy->Address->NULL
Printing list after insert
dummy->a(2)->take->increased->NULL
Printing list after insert
dummy->Gettysburg->Abraham->before->NULL
Printing list after insert
dummy->U.S.->us(2)->from->died->freedom->NULL
Printing list after insert
dummy->Address->NULL
Printing list after insert
dummy->President->of(4)->NULL
Printing list after insert
dummy->Address(2)->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->Address(2)->NULL
Printing list after insert
dummy->Lincoln,(2)->great->remaining->honored->NULL
Printing list after insert
dummy->Address(2)->NULL
Printing list after insert
dummy->they->NULL
Printing list after insert
dummy->best(2)->government->NULL
Printing list after insert
dummy->Gettysburg(2)->Abraham(2)->before->not(2)->NULL

Printing list after insert
dummy->Gettysburg(2)->Abraham(2)->before->not(2)->November->NULL
Printing list after insert
dummy->be->these(2)->NULL
Printing list after insert
dummy->last->NULL
Printing list after insert
dummy->Address(2)->NULL
Printing list after insert
dummy->be->these(2)->1863,->NULL
Printing list after insert
dummy->Address(2)->NULL
Printing list after insert
dummy->they->afternoon->NULL
Printing list after insert
dummy->that(6)->we(2)->NULL
Printing list after insert
dummy->last->at->NULL
Printing list after insert
dummy->rather->shall(3)->have(2)->vain->NULL
Printing list after insert
dummy->President(2)->of(7)->earth.->NULL
Printing list after insert
dummy->The(2)->speech(2)->one(2)->here(2)->devotion(2)->NULL
Printing list after insert
dummy->It(3)->was(2)->NULL
Printing list after insert
dummy->rather->shall(3)->have(2)->vain->Gettysburg,->NULL
Printing list after insert
dummy->that(6)->we(2)->National->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->Address(2)->NULL
Printing list after insert
dummy->NULL
Printing list after insert
dummy->best(2)->government->Thursday,->NULL
Printing list after insert
dummy->Lincoln,(2)->great->remaining->honored->on->NULL
Printing list after insert
dummy->history.(2)->NULL
Printing list after insert
dummy->Address(2)->NULL

Printing list after insert
dummy->best(2)->government->Thursday,->armies->NULL
Printing list after insert
dummy->Address(2)->NULL
Printing list after insert
dummy->resolve->NULL
Printing list after insert
dummy->Civil(2)->task->gave->measure->NULL