JAVA 编程进阶上机报告



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一、实验要求

编写程序,统计了不起的盖茨比中各个单词出现的频次(结果按照单词的频次倒序排列),并为输入文件,创建一个 output.txt

二、源代码

```
package lab2;
import java.io.BufferedReader;
import java.io.File;
import java.io.FileInputStream;
import java.io.FileNotFoundException;
import java.io.FileWriter;
import java.io.IOException;
import java.io.InputStream;
import java.io.InputStreamReader;
import java.io.Writer;
import java.util.ArrayList;
import java.util.Collections;
import java.util.Comparator;
import java.util.HashMap;
import java.util.Iterator;
import java.util.List;
import java.util.Map;
import java.util.Map.Entry;
import java.util.TreeMap;
public class readfile {
//判断是否为要求的编码格式
   public static boolean code(File file) throws IOException {
       try {
       InputStream ios=new FileInputStream(file);
       byte[] b=new byte[3];
         ios.read(b);
         ios.close();
         if(b[0]==-17&&b[1]==-69&&b[2]==-65) {
             return true;
         }
   }catch (Exception e) {
       System.out.println("读取文件错误");
       e.printStackTrace();
```

```
}
       return false;
}
//读入文件并将其按字符串内容、数量用map记录
       public static Map<String,Integer> readFile(String filePath){
           Map<String,Integer> map = new TreeMap<String,Integer>();
          try {
              File file=new File(filePath);
              if(!file.canRead()) {
              System.out.println("文件无读权限");
              }else if(code(file)){
              System.out.println("文件编码错误");
              }else if(file.exists()){
               BufferedReader Bufferedreader = new BufferedReader(new
InputStreamReader(new FileInputStream(filePath)));
                 String words = "";
                 while((words = Bufferedreader.readLine())!=null){
                     String[] wordline = words.split("\\s+");
                     for(String word:wordline){
                         if(map.containsKey(word)){
                            int n =1 + map.get(word);
                          map.remove(word);
                          map.put(word, (Integer)n);
                         }else{
                            map.put(word, 1);
                         }
                     }
                  }
                     Bufferedreader.close();
                                                          }else{
                     System.out.println("没有指定的文件");
                  }
           } catch (Exception e) {
              System.out.println("无法读取文件");
              e.printStackTrace();
           }
           return map;
       }
//借用list排序
       public static List<Map.Entry<String,Integer>>
   sort(Map<String,Integer> map) {
           List<Map.Entry<String,Integer>> list = new
   ArrayList<Map.Entry<String,Integer>>(map.entrySet());
```

```
Collections.sort(list,new
   Comparator<Map.Entry<String,Integer>>() {
              public int compare(Entry<String, Integer> o1,
                      Entry<String, Integer> o2) {
                  return o2.getValue().compareTo(o1.getValue());
              }
           });
           return list;
       }
//将内容写入output文件中
       public static void write(List<Map.Entry<String,Integer>> list)
   throws IOException {
           try {
           File file = new File("D:" + File.separator + "output.txt");
           Writer writer = new FileWriter(file);
           Iterator<Entry<String, Integer>> iterator = list.iterator();
           while(iterator.hasNext()){
               Entry<String, Integer> entry = iterator.next();
               String str = entry.getKey()+" "+entry.getValue()+"\n";
               char[] c = str.toCharArray();
               writer.write(c);
           }
           writer.flush();
               writer.close();
                                  }catch (Exception e) {
              System.out.println("输出文件出错");
              e.printStackTrace();
           }
       }
       public static void main(String argv[]) throws IOException{
       Map<String,Integer> map = new TreeMap<String,Integer>();
       map = readFile("D:/Download/了不起的盖茨比英文.txt");
       List<Map.Entry<String, Integer>> list = sort(map);
           write(list);
       }
   }
```

三、实验结果

```
■ output.txt - 记事本
文件(F) 编辑(E) 格式(O) 查看(V) 帮助(H)
the 1887
I 1270
and 1267
a 1208
of 1008
to 999
in 677
was 671
he 546
that 503
s 442
at 425
it 413
his 384
t 382
you 380
with 348
had 330
her 312
on 303
me 282
she 262
Gatsby 258
for 250
him 239
He 221
as 219
said 219
from 193
此电脑 > 新加卷 (D:)
                                                                        修改日期
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        名称
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        output.txt
                                                                        2020/3/18 21:51
                                                                                                           文本文档
                                                                                                                                                105 KB
```

四、设计

readfile
+ code(file: File): boolean + readFile(filePath: String): Map <string,integer> + sort(map: Map<string,integer>): List<map.entry<string,integer>> + write(list: List<map.entry<string,integer>>): void + main(argv: String): void</map.entry<string,integer></map.entry<string,integer></string,integer></string,integer>

readfile: 读入文件,若文件不存在、无读权限、文件编码错误则抛出异常,若正常则一个个读入单词并通过 map<String, Integer>记录次数

code: 通过 InputStream 读取文件并通过前 3 个字节判断编码类型

sort:转成 list 通过 Collections. sort 函数按 Value 值倒着排序

write: 遍历 list 并转成 String 通过 writer.write 写入对应文件

中