

浙江大学 实验报告

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实验名称: Grading System 实验类型: 编程实现 学生学号: 3120102116

一、实验目的和要求

目的

Write a program that maintains a "database" of names and scores of students.

A student has a name consists of several words and records of scores of varies courses. Each record has a name of the course and the marks the student gets.

User can input or import information and scores for students and retrieve them later. To input a score, the user may key in the name of the student, the name of the course and the marks. Your program then try to find the student in the database and add or replace the score for the course. If the student can not be found in the database, a new student should be created and be put into the database. If the course can not be found in the records of the student, a new record for the course should be created, otherwise, the score should be replaced by the newly inputed one.

The user can provide name of a .CSV file which contains records of students information to import the data into the database. The columns in the .CSV files are:

name, course name, score

User can input the name of a student to retrieve the scores of all the courses he/she gets, along with the total and average marks. User can input name of a course to retrieve a list of every student who has marks for this course, along with the number of the students and the average marks.

要求

The program is able to store the database into a file and read them back at the beginning of the execution.

The whole system is a Unix style shell system, which means you are going to develop one program for one function of your system, not a concrete one big program, no menus, no GUIs.

二、实验内容和原理

用 `BufferedReader` 和 `BufferedWriter` 对 .CSV 文件按行读取数据，并将数据用字符串中的 `Split` 方法按逗号 “,” 分割。从而分别得到学生姓名，课程名字，以及对应的分数，再做相应操作。

三、主要仪器设备

Thinkpad T420 —— Intel Core I5, 8G RAM, Ubuntu 13.04 with Gnome desktop

JDK: oracle-java8-jdk

四、操作方法和实验步骤

键入代码，利用 `Javac` 命令通过 JDK 编译得到 .class 文件，再用 `java` 命令运行即可。

五、实验数据记录和处理

```
GradeSystem [Java Application] D:\Program Files\Java\bin\javaw.exe (2014年12月14日 下午1:06:15)
Welcome to the grade system!
Please input help for any guidance of using the system!
What do you want to do?
*****
<User>|
```

运行后进入系统，出现如图的提示信息。我们输入 `help` 命令进行操作指导。

```

*****
<User>help
You can use the system with the following commands:
add [student name] [course name] [grade]
This command is used for adding information!
select
If no option is chosen, print all items!
-s [student name]
The command with this option is used for selecting the information of an exact student!
-c [course name]
The command with this option is used for selection the information of an exact course!
exit
This command is used for quitting the system!
<User>

```

可以发现我们可以用 `add` 命令和相应参数插入数据，`select` 命令和相应的选项的功能也已经列出。

我们先用不带参数的 `select` 命令列出数据库中所有的信息。

```

<User>select
He get 100 in java
He get 100 in cs
He get 90 in math
<User>

```

可以发现有三条信息，姓名为 `He` 的学生在课程分别为 `java`, `cs`,

`math` 中的得分。

现在修改 `java` 的分数为 90:

```

<User>add He java 90
<User>select
He get 100 in cs
He get 90 in math
He get 90 in java
<User>

```

可以发现 `He` 在 `java` 中的得分已经被修改为 90.

接下来我们插入两个本来不存在的学生的和存在学生的某门未知学科的分:

```

<User>add She cs 100
<User>add He science 100
<User>select
He get 100 in cs
He get 90 in math
He get 90 in java
She get 100 in cs
He get 100 in science
..

```

可以发现关于 `She` 在 `cs` 中的得分和 `He` 在 `science` 中的得分

都被成功插入了

最后是带参数的 `select` 命令，我们用他来选择某门课的得分信息和某个学生的得分信息。

```

<User>select -s He
He get 100 in cs
He get 90 in math
He get 90 in java
He get 100 in science
The total grade is: 380
The average grade is: 95.0
..

```

输出 `He` 的所有课程得分，以及总分和平均分

```
<User>select -c cs
He get 100 in cs
She get 100 in cs
The total grade is: 200
The average grade is: 100.0
```

输出所有学生在 cs 中的得分以及总分和平均分

```
<User>select -s He -c math
He get 90 in math
```

输出 He 在 math 中的得分

```
<User>exit
Thanks for using!
```

输入 exit 命令退出程序

注意，代表数据库的.CSV 文件应该命名为 grade.CSV

六、实验结果和分析

实验可以按照预期正确运行，也可以正确发出操作提示和错误提示等。
对数据库的修改和读取都很正确。

七、讨论和心得

在本次实验中，我熟悉了如何利用 `BufferedReader` 和 `BufferedWriter` 对文件进行数据的读取和写入，并且掌握了如何巧妙利用字符串分割的方法去对字符串的信息进行提取。此外，在对文件的修改操作中，需要用到另外一个临时文件进行写操作，在全部修改完成后，将整个临时文件的所有数据全部都拷贝到原始文件中，以此来完成文件的修改。

另外，本次实验还成功完成了 Unix 风格 shell 命令解释器的编写。这对以后的工程项目起到了巨大作用。