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CSE 2031 Software Tools
Assignment 3 – Shell Scripting
Due Date: July 31, 2010 12:00pm

1. Specification

In this assignment you will design a simple file based database. All the files are in the simplest form of CSV (Comma Separated Values) where every pair of adjacent fields are separated by a comma and the fields do not contain any commas, not even escaped. Every line contains a single record and every record contains several fields. A set of files will be provided and your code will be tested against these files as well as a few more that you will not know in advance. You can use either sh or bash. You can use any standard utility we discussed in class but you cannot write a program in any other programming environment. Your programs do not create any file (other than a possible temporary file in the /tmp/ directory) anywhere and print everything in the standard output.

2. Files

The database will have three types of files. The first, of which there is only one instance, is the `Accounts` file. It contains records that have three fields. The first field is an account number, the second is the last name of the student and the third is the first name. Please note that some students have names with non letter characters like space, dot or hyphen.

The second type of file is the car lending record file, one for each car and they are named `CARxxxx` where the x's are digits. They contain a series of records, each one with a single field, an account number. If a customer has lent a car, his account number appears in the corresponding file.

The third type of file is the billing file, the one containing billings for each car and each customer that has lent a car. They are named `BILxxxx` and are associated with the corresponding `CARxxxx` file. The files contain several records, one for each customer that borrowed the car. Every record contains three fields: the account number, number of kilometres (non negative integer) and the rate per km from 0 to 100 CAD. If a customer is in the `CARxxxx` but has no record in the corresponding `BILxxxx` or if the file `CARxxxx` exists but the file `BILxxxx` does not customer gets IP (that is In Progress).

There is one more file in the database and this resides in the home directory of the user, is named `.cse2031_db` and contains exactly one statement

`STD_DBROOT=<path_to_your_db>`

and this is used by your scripts to find where is the directory of the database.

3. Scripts

You have to write four scripts. All scripts follow the specification regarding the startup file `.cse2031_db` and provide reasonable error reporting. All missing files should be reported. The output should be exactly as in the specification without anything extra.

a. Find name by CustId

Write a script `db_acc2name` that given the account number of a customer as a command line argument returns the name as comma separated values as shown below

```
First_name, surname
```

b. Find all cars borrowed by customer (by CustId)

Write a script `db_acc2cars` that given the account number of a customer as a command line argument returns the comma separated list of cars the customer has borrowed. For example:

```
CAR1111, CAR2222, CAR1234
```

c. Find billings for all cars of customer (by CustId)

Write a script `db_acc2bills` that given the account number of a customer as a command line argument returns the comma separated list of cars and billed amounts the customer will pay (rate*km). For example:

```
CAR1111 120, CAR2222 987, CAR1234 45
```

d. Table

Write a script `std_db_acc2table` that returns a CSV file with the following structure. All records in the file contain the same number of fields. The first record is the header record and its first field is just the string “Cust. Name”. The rest of the fields are the 4 digit codes for the all the cars. All the subsequent records have as their first field the customer name (first name first, then last name and no comma in between) and the rest of the fields are the corresponding bills, blank if the customer has not borrowed the car, the amount billed or IP if the customer has borrowed it. Customers that have lent no cars do not have a record in this table.

4. Submission

Your submission will be four files, the four scripts mentioned above. The `.cse2031_db` file does not need to be submitted. Your code should be commented at a reasonable level, with a clear header indicating authorship, dates etc. About one comment per functional block is appropriate.

Put all files in a folder called a3 and use following command to submit your solution:

```
submit 2031 a3 a3
```