



**Hacettepe University**  
**Department of Computer Science & Engineering**

<b>Name and Surname</b>	:	Serdar GÜL
<b>Identity Number</b>	:	20421689
<b>Course</b>	:	Bil-235
<b>Experiment</b>	:	Experiment-5
<b>Subject</b>	:	Writing UNIX Shell Scripts
<b>Date Due</b>	:	19.12.2008
<b>Advisors</b>	:	Prof. Dr. Ali SAATÇI , R.A. Kerem
ERZURUMLU		
<b>E-mail</b>	:	fuchserdar@gmail.com

## **SOFTWARE CATOLOGUE INFORMATION PAGE**

<b>Programmer</b>	:	Serdar GÜL
<b>Programming Language</b>	:	Bourne Again Shell
<b>Main Program</b>	:	tables.sh
<b>Operating System</b>	:	UNIX operating system

## 2.SOFTWARE USING DOCUMENTATION

### 2.1.SOFTWARE USAGE

This program is about a relational database system that consists of tables. When the program started a menu, that contains table operations, record operations and terminate operation, displays. The menu looks like:

```
b20421689@sl10:~/Desktop/serdarodev
File Edit View Terminal Tabs Help
[b20421689@sl10 ~]$ cd desktop
bash: cd: desktop: No such file or directory
[b20421689@sl10 ~]$ cd Desktop
[b20421689@sl10 Desktop]$ cd serdarodev
[b20421689@sl10 serdarodev]$ bash tables

*****
*****          MENU          *****
*****

To create a table press 1,
To delete a table press 2,
To insert a record to any table press 3,
To delete a record from any table press 4,
To exit the program press 6.
*****
Please make your choice:█
```

- If the user selects (1): Program asks the user the table's name that the user wants to create, then the number of the columns that this table would have and the names of the columns. After each column program asks the user if that column is a foreign key. If then asks the user the table's name that will be referred.
- If the user selects (2):Program asks the user the table's name that the user wants to delete.
- If the user selects (3):Program asks the user the table's name to where the user wants to insert a record.Then the records for each column of the table.

- If the user selects (4):Program asks the user the table's name from where the user wants to delete a record. Then asks the column number where the deletion keyword would be searched.
- If the user selects(6):Program terminates.

## **2.2.ERROR MESSAGES**

1. If user enters a something except for the digits in [0-5] program gives this message:
  - 1.1.1."Please make your choice in [1-5]"
2. While creating a table if the user enter a name that is already in use program gives this message:
  - 2.1.1."There is already a table with given name, please choose another."
3. While creating a table if the table has a foreign key this means it refers a table, if there isn't a table with given as to be referred table name program gives this message:
  - 3.1.1.The "\$reference\_table" table doesn't exist now, so "\$table\_name" table couldn't be created."
  - 3.1.2."Please create "\$reference\_table" table firstly."
4. While creating a table if it refers a table but, referred table hasn't got a field as same name the foreign key in the table that refers this, program gives this message:
  - 4.1.1."The "\$reference\_table" table doesn't contain a field named "\$field", so "\$table\_name" table couldn't be created."
5. While deleting a table if the table doesn't exist program gives this message:
  - 5.1.1."The table with given name doesn't exist, so you can't delete!"
6. While deleting a table if the table is referred by any other table, and this table have records program gives this message:

- 6.1.1."You can't delete "\$table\_name" table, because it is referred by "\$control1" table."
7. While inserting a record to a table if table doesn't exist program gives this message:  
7.1.1."There isn't a table named "\$table\_name", please create a table first..."
8. While inserting a record if the record is the foreign key, but if the referred table doesn't contain this value program gives this message:  
8.1.1."There isn't a record as "\$record" in "\$field\_name" column in "\$reference\_table" table, so insertion couldn't be done"
9. While deleting a record if the table where the deletion will be done doesn't exist program gives this message:  
9.1.1."There isn't a table named ""\$table\_name"", so you can't do any deletion."
10. While deleting a record if the value that is wanted to be deleted is referred by any table program gives
11. this message:  
11.1.1. "Deletion can't be done because field is referred."
12. While deleting a record if the value that is wanted to be deleted hasn't been contained by the table program gives this message:  
12.1.1. "There isn't a record as "\$keyword" in "\$table\_name" table's "\$col\_number", so deletion couldn't be done."

### **3.SOFTWARE DESIGN NOTES**

#### **3.1.DESRIPTION OF THE PROGRAM**

### **3.1.1.PROBLEM**

This experiment is about a simple database that contains only tables. In the program I was asked to do operations on tables. And the operations that can be done have to be displayed as a menu. The menu would have 5 options:

- 1.) Creating a table
- 2.) Deleting a table
- 3.) Inserting a record to a table
- 4.) Deleting a record from a table
- 5.) Terminating the program

To create a table, I have to ask the user the table name, the column number that the table would have, and the foreign keys in this table.

To delete a table, I have to ask the user the table name.

To insert a record to a table, I have to ask the table's name, and the field contents.

To delete a record from a table, I have to ask the user the table's name, and the column's number where I search the deletion keyword, and of course the deletion keyword.

### **3.1.2.SOLUTION**

While creating a table I have to :

- 1.) Control if a table was created before with the same name.
- 2.) Control if the table that the main table's foreign keys refer exists.
- 3.) Control if the table exists and contains a field as the same name as the field that refers this table.
- 4.) If all the criteria are ok, then create a table.

While deleting a table I have to :

- 1.)Control if the table exists.
- 2.)Control if it is referred by a table.
- 3.)Control if the table that refers the main table, has any records.
- 4.)If all the criterias ok,then delete the table.

While inserting a record I have to:

- 1.)Control if the table exists.
- 2.)Control if the table has foreign keys
- 3.)Control if the referred table exists.
- 4.)Control if the referred table has the same field as the foreign key.
- 5.)If all criterias ok,insert the record.

While deleting a record I have to:

- 1.)Control if the table exists.
- 2.)Control if it contains the keyword.
- 3.)Control if the referred table exists.
- 4.)Control if the lines' ,that contains keyword, foreign keys ae contained by the referred table.
- 5.)If all criterias ok, then delete the record.

### 3.2.SYSTEM CHART

<u>Input</u>	<u>Program</u>	<u>output</u>
	tables	Output file(Text)

### 3.3.MAIN DATA STRUCTURES

### 3.4.ALGORITHM

#### **menu():**

Start

\* Display the menu.

Get the user's choice.

Control if it is legal for the program.

If it is

Control the number if it is:

(1) call create\_table function and repeat from \*.

(2) call delete\_table function and repeat from \*.

(3) call insert\_record function and repeat from \*.

(4) call delete\_record function and repeat from \*.

(6) terminate the program.

Else

Give a message and repeat the steps from \*.

//end of menu function

#### **create\_table():**

Start

Get the name of the table that is wanted to be created.

Control if it was created before

If it was:

Give an error message.

Else

Get the number of the columns.

Hold a variable(i) that begins from 1 and increases until column number

Get the field name.

Ask if it is a foreign key.

If it is

Get the table's name that will be referred.

Control if the table exist

If it is control if it contains a field that has the same name as foreign key

If it has

Add the field name to the table

Else give an error message

Else

Give an error message

// end of create\_table function



### **delete\_table():**

Start

Get the name of the table that is wanted to be deleted.

Control if it exists.

    If it is

        Control if there is any table that refers this.

        If it is

            Control the file that refers it, if it has any records

            If it hasn't got

                Delete the the table

            Else

                Give an error message

        Else

            Give an error message

//end of delete\_table function

### **insert\_record():**

Start

    Get the name of the table to where a record is wanted to be  
inserted.

    Control if it exist

    If it is

        Hold a variable(i) that begins from 1 and increases until  
column number

        Get the record for that field

        Control if the field is a foreign key

            If it is

                Control if the referred table exist

                If it is

                    Control if same field in referred  
table, contains the record

                    If it does

                        Insert the record

                    Else

                        Give an error message

                Else

                    Give an error message

        Else

            Give an error message

//end of insert\_record function

### **delete\_record():**

Start

Get the table name where the deletion will be done

Control if it exists

If it is

Get the column's number and the deletion keyword

Control if table contains the keyword in that column

If it does

Control if this table is referred by any table

If it is

Control if the table that refers this contains a record that is same in the line's, where the keyword is found, referred field.

If it does

Give an error message

Else

Delete the record

Else

Delete the record

Else

Give an error message

Else

Give an error message

//end of delete\_record function

## **3.5.EXECUTION FLOW BETWEEN SUBPROGRAMS**

create\_table():

It creates table.

It is called by menu function, and by itself.

It calls itself.

delete\_table():

It deletes table.

It is called by menu function.  
It calls nothing.

insert\_record():

It inserts a record to a table.  
It is called by menu function.  
It calls nothing.

delete\_record():

It deletes a record from a table.  
It is called in menu function.  
It calls nothing.

menu():

It displays the menu, and gets the choice of the user .  
It isn't called by any function.  
It calls create\_table, delete\_table, insert\_record, delete\_record and functions.

And there are some screenshots for the execution of the program.

That is for creating a table

```
b20421689@sl10:~/Desktop/serdarodev
File Edit View Terminal Tabs Help
*****
***** MENU *****
*****
To create a table press 1,
To delete a table press 2,
To insert a record to any table press 3,
To delete a record from any table press 4,
To exit the program press 6.
*****
Please make your choice:1
Enter the table's name:a
There is already a table with given name,please choose another.
Enter the table's name:b
Enter the number of the columns:2
1.column:h
2.column:j
Press a key...
█
```

That is for deleting an existing table

```
b20421689@sl10:~/Desktop/serdarodev
File Edit View Terminal Tabs Help
*****
***** MENU *****
*****
To create a table press 1,
To delete a table press 2,
To insert a record to any table press 3,
To delete a record from any table press 4,
To exit the program press 6.
*****
Please make your choice:2
Enter the table's name that you want to delete: a
Press a key...
█
```

That is for inserting a record to the existing table

```
b20421689@sl10:~/Desktop/serdarodev
File Edit View Terminal Tabs Help
*****
*****      MENU      *****
*****
To create a table press 1,
To delete a table press 2,
To insert a record to any table press 3,
To delete a record from any table press 4,
To exit the program press 6.
*****
Please make your choice:3
Enter the table's name where the record will be inserted:a
a: sdf
b: sdfnj
c: thj
d: sdf
e: nn
Press a key...
█
```

That is for terminating the program...

```
b20421689@sl10:~/Desktop/serdarodev
File Edit View Terminal Tabs Help
*****
*****      MENU      *****
*****
To create a table press 1,
To delete a table press 2,
To insert a record to any table press 3,
To delete a record from any table press 4,
To exit the program press 6.
*****
Please make your choice:6
Bye bye...:)
[b20421689@sl10 serdarodev]$ █
```

## **4.SOFTWARE TESTING NOTES**

### **4.1.BUGS AND SOFTWARE RELIABILITY**

While getting a record even it is a table name or a field name...etc if the user enters a string that contains 2 or more words that are seperated with a " " my program runs wrong.So user has to enter records only 1 word.If he wants to enter a record that contains more than 1 word he should enter them seperated with a "." or "," ...etc.

And I didn't do a sort function in the program.As you can see in the menu there is no option for the sort function for the table elements.

### **4.2.PERFORMANCE CONSIDERATIONS**

And with some little changes my program will be used in a lot of variable subjects.And with some modification I can use Bash commands it can be used in a lot of ways and also that I can make an automation system for students teachers and courses for some schools which work with the UNIX operating system..

### **4.3.COMMENTS**

At first I can say that this experiment was so useful for me.I remember the Linux Kernel (Bourne Again Shell a.k.a. bash) again.And also that it was a fun subject.But I have not enough time to make it excellent.Because of this I apologise to you.And I had another programming course named Bil341.Because of this I had a lot of difficulties while coping with this experiment.

And I just want you that if you think about these when giving the note for my source code and report I will be so appreciate to you...

## REFERENCES

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Bash Guide for Beginners / Machtelt Garrels  
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BASH Programming – Introduction HOW–TO / Mike G  
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And the websites I had visited

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