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CS-6360 Programming Assignment 2 – DavisBase

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DavisBase is a primary relational database system developed as part of Data Base Design course.

DavisBase supports only one database and one user which are set up by default. User can create multiple tables in the database. Supported commands are as follows.

- **SHOW TABLES;**
  - Displays all the tables in the database.
- **CREATE TABLE table_name (<column_name datatype>);**
  - Creates a new table in the database.
- **INSERT INTO table_name (column1, column2...) VALUES (value1, value2,..);**
  - Inserts a new record into the table.
- **SELECT * FROM table_name;**
  - Displays all records in the table.
- **SELECT * FROM table_name WHERE column_name operator value;**
  - Displays all the records of the table where the given condition is satisfied.
- **DROP TABLE table_name;**
  - Removes table data and its schema.
- **VERSION;**
  - Displays the program version.
- **HELP;**
  - Displays this help information.
- **EXIT;**
  - Exits from DavisBase.

All the commands are case insensitive. For demonstration, load the folder

Instructions for running DavisBase application:

- Extract the compressed folder downloaded from eLearning DavisBase_sxm190011.
- Import the folder into the Eclipse IDE / IntelliJ.
- Run the DavisBase.java to start the application.

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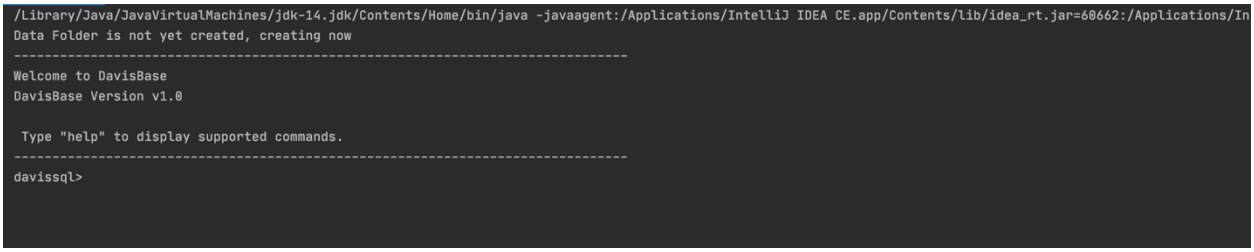
- Initially when the application is run it creates a directory **"data"** and creates files **"davisbase_tables.tbl"** and **"davisbase.columns.tbl"** with initial information.

From local terminal:

- Extract the compressed folder DavisBase_sxm190011.
- Open terminal or command prompt
- **`Java version: java 14`**
- Navigate to the path where the folder has been extracted.
- Change directory to the DavisBase\src\database in terminal and compile all files using the below command: **javac *.java**
- Change directory to parent directory (DavisBase\src)
- Run DavisBase.class file using the below command: **java database.DavisBase**

Command Formats and examples from the project:

1. Initial home page and davisbase_tables.tbl and davisbasecolumns.tbl files are created when we run application for the first time.



2. **Create table command** – create table <table_name> (column1 datatype, column2 datatype, …);
    a. Use spaces between each word.

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```
 Type "help" to display supported commands.
--------------------------------------------------------------------------------
davissql> create table employee (empid int , name string [notnull] , salary int);
Table employee created successfully.

davissql>
```

3. **Show tables command** – show tables; will display all the tables exists in the database.
    a. Davisbase_tables.tbl

```
davissql> show tables;
--------------------
table_name          |
--------------------
davisbase_tables    |
davisbase_columns   |
employee            |

davissql>
```

4. **Insert data command** – insert into <table_name> values (val1, val2, val3);

```
davissql> insert into employee values ( 1, vikas , 100000);
Inserted Successfully

davissql>
```

    a. If the column doesn't contain data provide null in the respective position.
    b. Null constraint and primary key constraints are implemented.

```
davissql> insert into employee values(1,meda,123123123);
Uniqueness constraint violation

davissql>
```

```
davissql> insert into employee values (1,null,1234);
NULL constraint violation
davissql>
```

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5. **Select command** – select * from <table_name>;

```
davissql> select * from davisbase_columns;
------------------------------------------------------------------------------------------
rowid   |table_name          |column_name        |data_type   |ordinal_position   |is_nullable   |
------------------------------------------------------------------------------------------
1       |davisbase_tables    |rowid              |INT         |1                  |NO            |
2       |davisbase_tables    |table_name         |TEXT        |2                  |NO            |
3       |davisbase_columns   |rowid              |INT         |1                  |NO            |
4       |davisbase_columns   |table_name         |TEXT        |2                  |NO            |
5       |davisbase_columns   |column_name        |TEXT        |3                  |NO            |
6       |davisbase_columns   |data_type          |TEXT        |4                  |NO            |
7       |davisbase_columns   |ordinal_position   |TINYINT     |5                  |NO            |
8       |davisbase_columns   |is_nullable        |TEXT        |6                  |NO            |
9       |employee            |empid              |INT         |1                  |YES           |
10      |employee            |name               |STRING      |2                  |NO            |
11      |employee            |salary             |INT         |3                  |YES           |


davissql>
```

   a. New row as been inserted into employee table;

```
davissql> select * from employee;
----------------------------
empid   |name       |salary    |
----------------------------
1       |vikas      |100000    |
2       |saivikas   |1200000   |
```

6. **Select command with conditions** – select * from <table_name> where condition1 ;

```
davissql> select * from employee where empid=1;
-------------------------
empid   |name    |salary   |
-------------------------
1       |vikas   |100000   |
```

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a. If the condition doesn't satisfy with any rows. No rows will be displayed.

```
davissql> select * from employee where empid=3;
---------------
empid|name|salary|
---------------
 now rows
```

7. B+ tree has been implemented. Employee has been inserted with 40 dummy data for proof.

```
davissql> select * from employee;
------------------------------
empid   |name       |salary      |
------------------------------
1       |vikas      |100000      |
2       |saivikas   |1200000     |
3       |meda       |1234        |
4       |qwerty     |54231       |
5       |asd        |54321       |
6       |dsa        |234234234   |
7       |qwe        |322432      |
8       |rty        |456         |
9       |cvb        |11111       |
10      |tyu        |4535        |
11      |ttt        |53446       |
12      |ttt        |53446       |
13      |ttt        |53446       |
14      |ttt        |53446       |
15      |ttt        |53446       |
16      |ttt        |53446       |
17      |ttt        |53446       |
18      |ttt        |53446       |
19      |ttt        |53446       |
20      |ttt        |53446       |
21      |ttt        |53446       |
22      |ttt        |53446       |
23      |ttt        |53446       |
24      |ttt        |53446       |
25      |ttt        |53446       |
26      |ttt        |53446       |
27      |ttt        |53446       |
28      |ttt        |53446       |
29      |ttt        |53446       |
30      |ttt        |53446       |
31      |ttt        |53446       |
32      |ttt        |53446       |
33      |ttt        |53446       |
34      |ttt        |53446       |
```