COP 6726 – Database System Implementation
Project 5 – Putting it all together

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1. Compilation and Execution steps

To compile and run tests:

i. To build the tests
>>make a5.out
ii. To run the tests
>>./a5.out

To compile and run gtests:

i. To build the gtests
>> make gtest.out
ii. To run the gtests
>>./ gtest.out

2. Implemented functions description:

i. a5main:
Query is taken as input by the main method and run() function of Execute class is called.

ii. run:
This function is called by a5main.cc. It creates the Queryops and QueryPlan objects. It takes the user input about action to be performed such as fire up the database, execute a cnf or close the database and calls the corresponding methods to perform the specified operation.

iii. createTable:
This function creates a table by taking attributes and type(sorted or heap) as input if it doesn't exist. If exists, it returns false else if table is created returns true.

iv. insertInto:
This function loads data into a table from the specified file. It bulk loads data.

v. dropTable:
This function removes the table and eliminate the binary file respectively.

vi. exists:
This function returns true if the relation exists, otherwise it returns false.

vii. setOutput:

This function in QueryPlan specifies the location where the result of operation is to be directed. It's usually one of STDOUT, 'file', NONE.

3. Results when queries are executed:

i. Query 1

```
dattavasireddy@dattavasireddy-VirtualBox:~/Downloads/pro5$ make a5.out
g++ -o a5.out Queryops.o Execute.o QueryPlan.o Statistics.o Record.o Comparison.o ComparisonEngine.o Schema.o File.o Pipe.o BigQ.o RelOp.o Fu
nction.o DBFile.o HeapFile.o SortedFile.o yyfunc.tab.o lex.yyfunc.o y.tab.o lex.yy.o a5main.o -lfl -lpthread
dattavasireddy@dattavasireddy-VirtualBox:~/Downloads/pro5$ make
make: Nothing to be done for 'all'.
dattavasireddy@dattavasireddy-VirtualBox:~/Downloads/pro5$ ./a5.out
1: FiredUp the Database
2: Enter your CNF
3: Close Database
1
*********DATABASE FIREDUP**********
1: FiredUp the Database
2: Enter your CNF
3: Close Database
2
Enter your CNF(add a ';' to miss syntax error):
SELECT n.n_nationkey
FROM nation AS n
WHERE (n.n_name = 'UNITED STATES');
------------------------------------------------------------
24|
1: FiredUp the Database
2: Enter your CNF
3: Close Database
3
**********CLOSED DATABASE***********
```

ii. Query 2

```
1: FiredUp the Database
2: Enter your CNF
3: Close Database
1
*********DATABASE FIREDUP**********
1: FiredUp the Database
2: Enter your CNF
3: Close Database
2
Enter your CNF(add a ';' to miss syntax error):
SELECT n.n_name
FROM nation AS n, region AS r
WHERE (n.n_regionkey = r.r_regionkey) AND (n.n_nationkey > 5);
------------------------------------------------------------------
KENYA|
MOROCCO|
MOZAMBIQUE|
PERU|
UNITED STATES|
INDIA|
INDONESIA|
JAPAN|
CHINA|
VIETNAM|
FRANCE|
GERMANY|
ROMANIA|
RUSSIA|
UNITED KINGDOM|
IRAN|
IRAQ|
JORDAN|
SAUDI ARABIA|
1: FiredUp the Database
2: Enter your CNF
3: Close Database
3
**********CLOSED DATABASE***********
```

iii. Query 3

```
*********DATABASE FIREDUP**********
1: FiredUp the Database
2: Enter your CNF
3: Close Database
2
Enter your CNF(add a ';' to miss syntax error):
SELECT SUM (n.n_nationkey)
FROM nation AS n, region AS r
WHERE (n.n_regionkey = r.r_regionkey) AND (n.n_name = 'UNITED STATES');
----------------------------------------------------------------
24|
1: FiredUp the Database
2: Enter your CNF
3: Close Database
3
**********CLOSED DATABASE**********
```

iv. Query 4

```
*********DATABASE FIREDUP**********
1: FiredUp the Database
2: Enter your CNF
3: Close Database
2
Enter your CNF(add a ';' to miss syntax error):
SELECT SUM (n.n_regionkey)
FROM nation AS n, region AS r
WHERE (n.n_regionkey = r.r_regionkey) AND (n.n_name = 'UNITED STATES')
GROUP BY n.n_regionkey;
----------------------------------------------------------------
1|1|
1: FiredUp the Database
2: Enter your CNF
3: Close Database
3
**********CLOSED DATABASE**********
```

v. Query 5

```
Enter your CNF(add a ';' to miss syntax error):
SELECT SUM (n.n_nationkey)
FROM nation AS n, region AS r
WHERE (n.n_regionkey = r.r_regionkey) AND (n.n_name = 'UNITED STATES');
-------------------------------------------------------------
24|
1: FiredUp the Database
2: Enter your CNF
3: Close Database
2
Enter your CNF(add a ';' to miss syntax error):
SELECT SUM (n.n_regionkey)
FROM nation AS n, region AS r
WHERE (n.n_regionkey = r.r_regionkey) AND (n.n_name = 'UNITED STATES')
GROUP BY n.n_regionkey;
-------------------------------------------------------------
1|1|
1: FiredUp the Database
2: Enter your CNF
3: Close Database
2
Enter your CNF(add a ';' to miss syntax error):
SELECT SUM DISTINCT (n.n_nationkey + r.r_regionkey)
FROM nation AS n, region AS r, customer AS c
WHERE (n.n_regionkey = r.r_regionkey) AND (n.n_nationkey = c.c_nationkey) AND (n.n_nationkey > 10)
GROUP BY r.r_regionkey;
-------------------------------------------------------------
2772|0|
2208|1|
3432|2|
4339|3|
3396|4|
1: FiredUp the Database
2: Enter your CNF
```

vi. Create table query

```
dattavasireddy@dattavasireddy-VirtualBox:~/Downloads/pro5$ ./a5.out
1: FiredUp the Database
2: Enter your CNF
3: Close Database
1
*********DATABASE FIREDUP**********
1: FiredUp the Database
2: Enter your CNF
3: Close Database
2
Enter your CNF(add a ';' to miss syntax error):
CREATE TABLE sql1(id INTEGER,name STRING) AS HEAP;
Created  sql1 Table;
1: FiredUp the Database
2: Enter your CNF
3: Close Database
3
**********CLOSED DATABASE**********
```

vii. Insert query

```
dattavasireddy@dattavasireddy-VirtualBox:~/Downloads/pro5$ ./a5.out
1: FiredUp the Database
2: Enter your CNF
3: Close Database
1
*********DATABASE FIREDUP**********
1: FiredUp the Database
2: Enter your CNF
3: Close Database
2
Enter your CNF(add a ';' to miss syntax error):
INSERT 'data.txt' INTO sql1;
Inserted into sql1
1: FiredUp the Database
2: Enter your CNF
3: Close Database
```

viii. Drop table query

```
dattavasireddy@dattavasireddy-VirtualBox:~/Downloads/pro5$ ./a5.out
1: FiredUp the Database
2: Enter your CNF
3: Close Database
1
*********DATABASE FIREDUP**********
1: FiredUp the Database
2: Enter your CNF
3: Close Database
2
Enter your CNF(add a ';' to miss syntax error):
DROP TABLE sql1;
Dropped table sql1 table
1: FiredUp the Database
2: Enter your CNF
3: Close Database
```

4. Gtest results:

i. TEST (CREATETEST, CREATETABLEPASS):
Google test to verify the successful table creation scenario.

ii. TEST (CREATETEST, CREATETABLEFAIL):
Google test to verify the table creation failure scenario.

iii. TEST (INSERTTEST, INSERTINTO):
Google test to verify the successful insertion into table scenario.

iv. TEST (DROPTEST, DROPTABLEPASS):
Google test to verify the successful table drop scenario.

v. TEST (DROPTEST, DROPTABLEFAIL):
Google test to verify the table drop failure scenario.

```
dattavasireddy@dattavasireddy-VirtualBox:~/Downloads/pro5$ make gtest.out
g++ -o gtest.out Queryops.o Execute.o QueryPlan.o Statistics.o Record.o Comparison.o ComparisonEngine.o Schema.o File.o Pipe.o BigQ.o RelOp.o
 Function.o DBFile.o HeapFile.o SortedFile.o yyfunc.tab.o lex.yyfunc.o y.tab.o lex.yy.o gtest.o -lfl -lpthread -lgtest
dattavasireddy@dattavasireddy-VirtualBox:~/Downloads/pro5$ ./gtest.out
[==========] Running 5 tests from 3 test suites.
[----------] Global test environment set-up.
[----------] 2 tests from CREATETEST
[ RUN      ] CREATETEST.CREATETABLEPASS
[       OK ] CREATETEST.CREATETABLEPASS (18 ms)
[ RUN      ] CREATETEST.CREATETABLEFAIL
[       OK ] CREATETEST.CREATETABLEFAIL (2 ms)
[----------] 2 tests from CREATETEST (21 ms total)

[----------] 1 test from INSERTTEST
[ RUN      ] INSERTTEST.INSERTINTO
[       OK ] INSERTTEST.INSERTINTO (4 ms)
[----------] 1 test from INSERTTEST (4 ms total)

[----------] 2 tests from DROPTEST
[ RUN      ] DROPTEST.DROPTABLEPASS
[       OK ] DROPTEST.DROPTABLEPASS (2 ms)
[ RUN      ] DROPTEST.DROPTABLEFAIL
[       OK ] DROPTEST.DROPTABLEFAIL (1 ms)
[----------] 2 tests from DROPTEST (4 ms total)

[----------] Global test environment tear-down
[==========] 5 tests from 3 test suites ran. (33 ms total)
[  PASSED  ] 5 tests.
dattavasireddy@dattavasireddy-VirtualBox:~/Downloads/pro5$
```