COP 6726 – Database System Implementation
Project 2_2: Sorted File Implementation Report (Part 2)

Group Members:

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Compilation and Execution:

To compile the code, run the following command:

```
>> make
```

To execute the test.cc code, change the directory to the specific folder (a2-2test) and run the following command:

```
>> ./test.out
```

To compile the gTest (gtest.cc) code, run the following command:

```
>> g++ -o gtest gtest.cc BigQ.cc DBFile.cc Schema.cc File.cc Record.cc
ComparisonEngine.cc Pipe.cc Comparison.cc -lgtest -lpthread
```

To execute the gTest (gtest.cc) code, run the following command:

```
>> ./gtest
```

Code Explanation (modified methods):

We have changed the class structure compared to the previous submission to accommodate SortedDBFile class. We have defined BaseDBFile class which consists of virtual functions that are common to both SortedDBFile and HeapDBFile class. SortedDBFile and HeapDBFile classes inherit BaseDBFile class. DBFile class will create an instance of BaseDBFile class. Depending upon the meta-data or the given input, HeapDBFile or SortedDBFile instance is created dynamically during runtime.

Filename: DBFile.cc

1. *SortedDBFile::Create(* f_path) method –*
   It creates the sorted DB file with specified path.

2. *SortedDBFile::Load(&f_schema, *loadpath) method –*
   Loads the sorted DB file with specified schema, bin file located at load path.

3. *SortedDBFile::Open(* f_path) method –*
   Opens the sorted DB file with specified path.

4. *SortedDBFile::MoveFirst() method –*
   Moves the current pointer to first record in the sorted DB file.

5. *SortedDBFile::Close() method –*
   Closes the sorted DB file.

6. *SortedDBFile::Add(rec) method –*
   Adds a record to the sorted DB file.

7. *SortedDBFile::GetNext(fetchRec) method –*
   Gets the next record from the sorted DB file.

8. *SortedDBFile::GetNext(fetchRec, cnf, literal) method –*
   Gets the next record from the sorted DB file with the specified CNF.

9. *SortedDBFile::MergeBigQToFile() method –*
   Merges the records of BigQ to the file.

10. *SortedDBFile::QueryOrderGenerator(query, order, cnf) method –*
    Generates query order based on the specified CNF.

11. *SortedDBFile::BinarySearch(fetchme, cnf, literal) method –*
    Searches/Scans the record based on CNF (Binary Search Algorithm).

12. *SortedDBFile::GetNextSequential(fetchme, cnf, literal) method –*
    Gets the next record sequentially based on the parameters.

13. *SortedDBFile::GetNextWithQuery(fetchme, cnf, literal) method –*
    Gets the next record sequentially based on the query provided.

14. *SortedDBFile::InitializeBigQ() method –*
    Initializes the BigQ object with input and output pipe and writing mode.

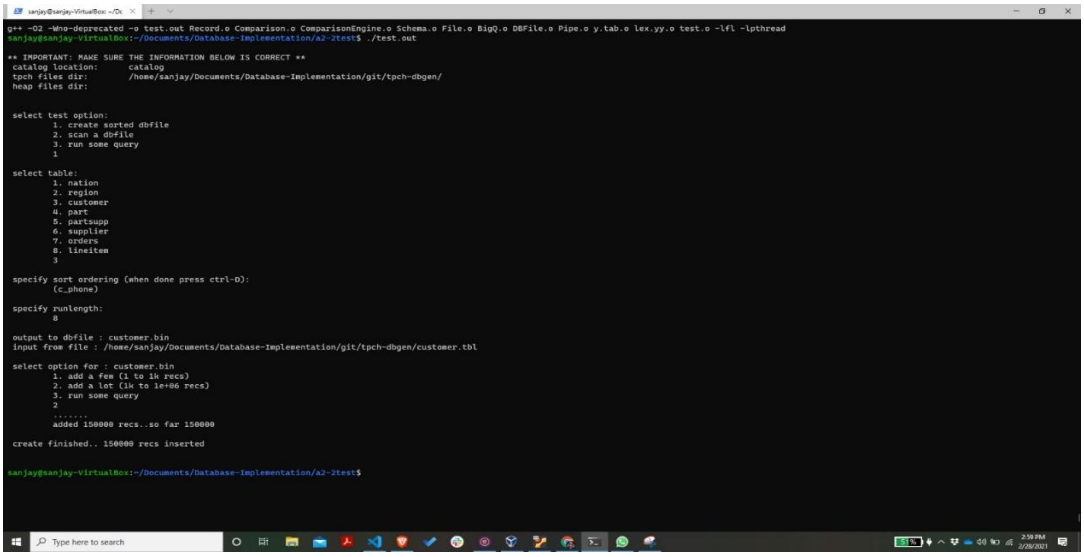
Filename: gtest.cc

```
TEST(Heap_DBFile_Test, ValidCreate) –
      Google test for valid heap DB file create scenario.
TEST(Heap_DBFile_Test, ValidOpen) –
      Google test for valid heap DB file open scenario.
TEST(Heap_DBFile_Test, ValidClose) –
      Google test for valid heap DB file close scenario.
TEST(Sorted_DBFile_Test, LoadTest) –
      Google test for valid sorted DB file load scenario.
TEST(Sorted_DBFile_Test, OrderTest) –
      Google test for valid sorted DB file order scenario.
```

Results for the Test Cases:

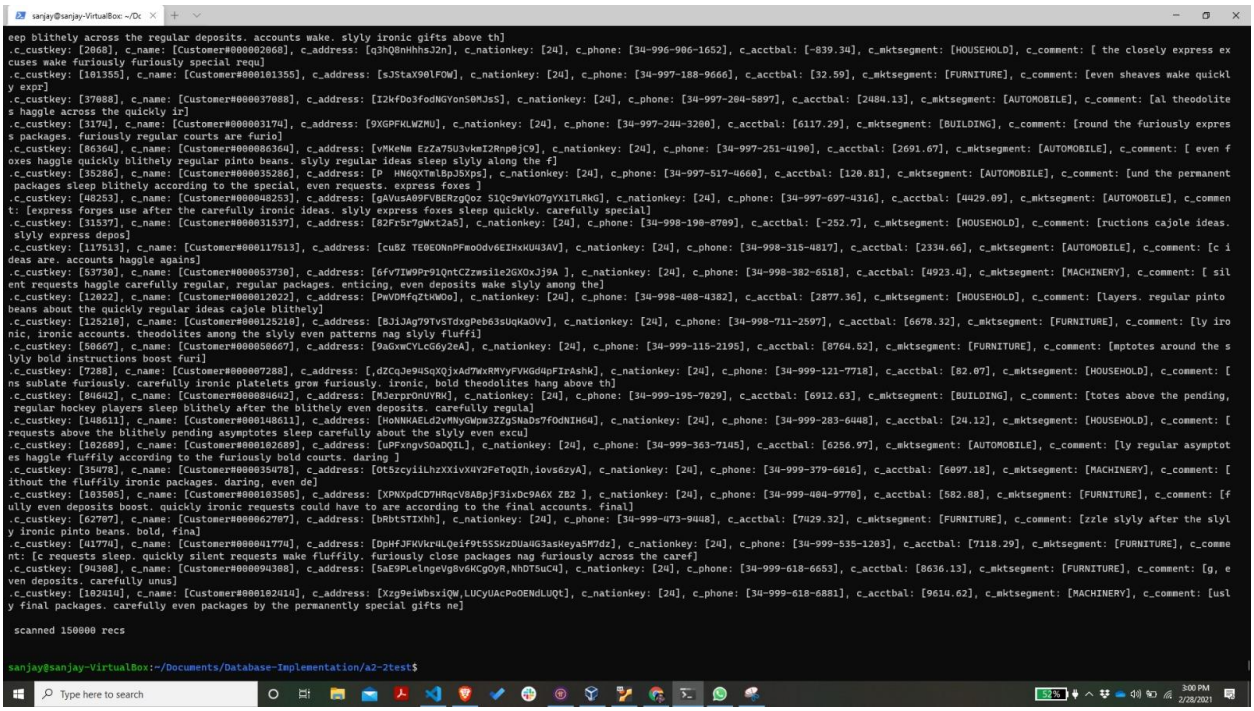
Test Case 1:

Input - 1; 3; (c_phone); 8; 2



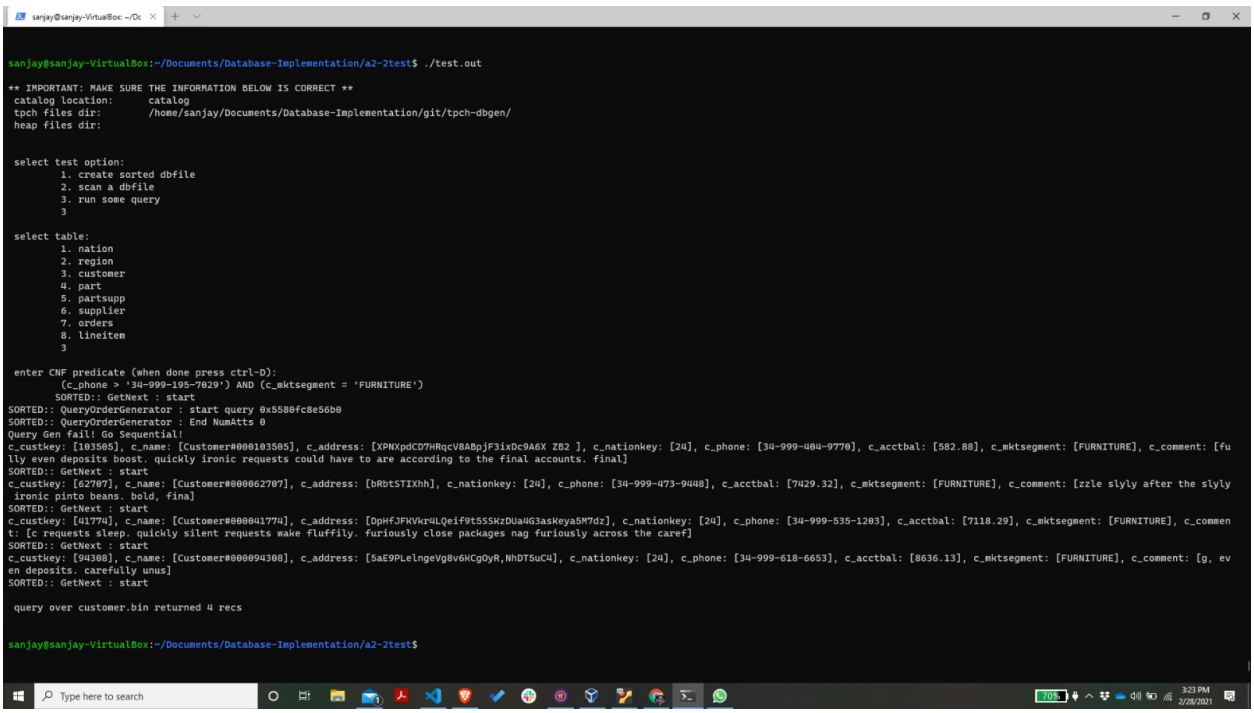
Test Case 2:

Input - 2; 3

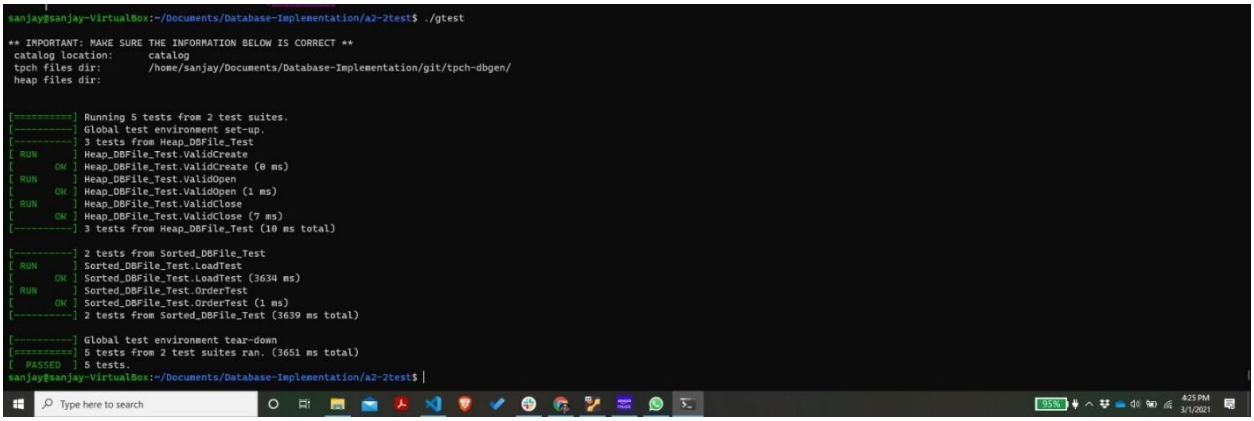


Test Case 3:

Input - 3; 3; (c_phone > '34-999-195-7029') AND (c_mktsegment = 'FURNITURE')



Results for gTests:


sanjay@sanjay-VirtualBox:~/Documents/Database-Implementation/a2-2test$ ./gtest
** IMPORTANT: MAKE SURE THE INFORMATION BELOW IS CORRECT **
catalog location: catalog
tpch files dir: /home/sanjay/Documents/Database-Implementation/git/tpch-dbgen/
heap files dir:
[==========] Running 5 tests from 2 test suites.
[----------] Global test environment set-up.
[----------] 3 tests from Heap_DBFile_Test
[RUN] Heap_DBFile_Test.ValidCreate
[OK] Heap_DBFile_Test.ValidCreate (0 ms)
[RUN] Heap_DBFile_Test.ValidOpen
[OK] Heap_DBFile_Test.ValidOpen (1 ms)
[RUN] Heap_DBFile_Test.ValidClose
[OK] Heap_DBFile_Test.ValidClose (7 ms)
[----------] 3 tests from Heap_DBFile_Test (10 ms total)
[----------] 2 tests from Sorted_DBFile_Test
[RUN] Sorted_DBFile_Test.LoadTest
[OK] Sorted_DBFile_Test.LoadTest (3634 ms)
[RUN] Sorted_DBFile_Test.OrderTest
[OK] Sorted_DBFile_Test.OrderTest (1 ms)
[----------] 2 tests from Sorted_DBFile_Test (3639 ms total)
[----------] Global test environment tear-down
[==========] 5 tests from 2 test suites ran. (3651 ms total)
[PASSED] 5 tests.
sanjay@sanjay-VirtualBox:~/Documents/Database-Implementation/a2-2test$
Type here to search
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3/1/2021