Heap File Implementation

Contributors:

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Steps to execute:
1] Unzip SiddharthJain_MeghaNagarmunoli_p1.zip

2] cd SiddharthJain_MeghaNagarmunoli_p1
Note: **SiddharthJain_MeghaNagarmunoli_p1** and **tpch-dbgen** should be in the same folder/level

3] To run the gTests,
   a) make gtests.out
   b) ./gtest.out

Output of gtests:

```
meghan@meghan-Inspiron-5584:~/Documents/gitWorkspace/database-systems-implementation$ make gtests.out
g++ -O2 -Wno-deprecated  -o gtests.out Record.o Comparison.o ComparisonEngine.o Schema.o File.o DBFile.o y.tab.o lex.yy.o gtests.o -lfl -lpthread -lgtest
meghan@meghan-Inspiron-5584:~/Documents/gitWorkspace/database-systems-implementation$
meghan@meghan-Inspiron-5584:~/Documents/gitWorkspace/database-systems-implementation$ ./gtests.out
[==========] Running 7 tests from 7 test cases.
[----------] Global test environment set-up.
[----------] 1 test from test_open
[ RUN      ] test_open.testingopen
[       OK ] test_open.testingopen (0 ms)
[----------] 1 test from test_open (0 ms total)

[----------] 1 test from test_open_empty_null
[ RUN      ] test_open_empty_null.testingopenemptynull
Path to create file is null!!!
Path to create file is null!!!
[       OK ] test_open_empty_null.testingopenemptynull (0 ms)
[----------] 1 test from test_open_empty_null (0 ms total)

[----------] 1 test from test_filetype_1
[ RUN      ] test_filetype_1.testfiletypesorted
Only heap file type supported!!!
[       OK ] test_filetype_1.testfiletypesorted (0 ms)
[----------] 1 test from test_filetype_1 (0 ms total)

[----------] 1 test from test_filetype_2
[ RUN      ] test_filetype_2.testfiletypetree
Only heap file type supported!!!
[       OK ] test_filetype_2.testfiletypetree (0 ms)
[----------] 1 test from test_filetype_2 (0 ms total)

[----------] 1 test from test_open_fail
[ RUN      ] test_open_fail.testfileopenfail
Empty file path!!!
[       OK ] test_open_fail.testfileopenfail (0 ms)
[----------] 1 test from test_open_fail (0 ms total)

[----------] 1 test from test_open_pass
[ RUN      ] test_open_pass.testfileopenpass
../bin/some.bin
[       OK ] test_open_pass.testfileopenpass (0 ms)
[----------] 1 test from test_open_pass (0 ms total)

[----------] 1 test from test_close_pass
[ RUN      ] test_close_pass.testfileclosepass
../bin/some.bin
[       OK ] test_close_pass.testfileclosepass (1 ms)
[----------] 1 test from test_close_pass (1 ms total)

[----------] Global test environment tear-down
[==========] 7 tests from 7 test cases ran. (1 ms total)
[  PASSED  ] 7 tests.
meghan@meghan-Inspiron-5584:~/Documents/gitWorkspace/database-systems-implementation$
> (gdb) Launch (database-systems-implementation)
```

4] To run tests.cc
   a) Make test.out
   b) ./test.out

The following are the results of various load, and scan and filter tests on nation, region and lineitem.

Q11 on lineitem returns 0 records for 10MB data

```
meghan@meghan-Inspiron-5584:~/Documents/gitWorkspace/database-systems-implementation$ ./test.out
catalog
** IMPORTANT: MAKE SURE THE INFORMATION BELOW IS CORRECT **
 catalog location:      catalog
 tpch files dir:        ../tpch-dbgen/
 heap files dir:        ../bin/


 select test:
         1. load file
         2. scan
         3. scan & filter
         3

 select table:
         1. nation
         2. region
         3. customer
         4. part
         5. partsupp
         6. orders
         7. lineitem
         7
 Filter with CNF for : lineitem
 Enter CNF predicate (when done press ctrl-D):
         (l_shipdate > '1994-01-01') AND
(l_shipdate < '1994-01-07') AND
(l_discount > 0.05) AND
(l_discount < 0.06) AND
(l_quantity = 4.0)
../bin/lineitem.bin
 selected 0 recs
```

Q12 on lineitem returns 35 records for 10MB data

File Edit Selection View Go Debug Terminal Help

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

4: bash

```
Number of records loaded :60175
meghan@meghan-Inspiron-5584:~/Documents/gitWorkspace/database-systems-implementation$ ./test.out
catalog
** IMPORTANT: MAKE SURE THE INFORMATION BELOW IS CORRECT **
 catalog location:      catalog
 tpch files dir:        ../tpch-dbgen/
 heap files dir:        ../bin/


select test:
        1. load file
        2. scan
        3. scan & filter
        3

select table:
        1. nation
        2. region
        3. customer
        4. part
        5. partsupp
        6. orders
        7. lineitem
        7
 Filter with CNF for : lineitem
 Enter CNF predicate (when done press ctrl-D):
        (l_orderkey > 100) AND
(l_orderkey < 1000) AND
(l_partkey > 100) AND
(l_partkey < 5000) AND
(l_shipmode = 'AIR') AND
(l_linestatus = 'F') AND
(l_tax < 0.07)
../bin/lineitem.bin
l_orderkey: [132], l_partkey: [281], l_suppkey: [63], l_linenumber: [4], l_quantity: [23], l_extendedprice: [27169.4], l_discount: [0.1], l_tax: [0], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1993-06-16], l_commitdate: [1993-08-27], l_receiptda
te: [1993-06-23], l_shipinstruct: [DELIVER IN PERSON], l_shipmode: [AIR], l_comment: [refully blithely bold acco]
l_orderkey: [164], l_partkey: [185], l_suppkey: [38], l_linenumber: [2], l_quantity: [24], l_extendedprice: [26044.3], l_discount: [0.05], l_tax: [0.05], l_returnflag: [R], l_linestatus: [F], l_shipdate: [1992-12-22], l_commitdate: [1992-11-27], l_recei
ptdate: [1993-01-06], l_shipinstruct: [NONE], l_shipmode: [AIR], l_comment: [side of the slyly unusual theodolites. f]
l_orderkey: [164], l_partkey: [1256], l_suppkey: [68], l_linenumber: [3], l_quantity: [38], l_extendedprice: [43975.5], l_discount: [0.03], l_tax: [0.06], l_returnflag: [R], l_linestatus: [F], l_shipdate: [1992-12-04], l_commitdate: [1992-11-23], l_rece
iptdate: [1993-01-02], l_shipinstruct: [TAKE BACK RETURN], l_shipmode: [AIR], l_comment: [counts cajole fluffily regular packages. b]
l_orderkey: [164], l_partkey: [1089], l_suppkey: [90], l_linenumber: [6], l_quantity: [27], l_extendedprice: [26732.2], l_discount: [0.1], l_tax: [0.04], l_returnflag: [R], l_linestatus: [F], l_shipdate: [1992-12-23], l_commitdate: [1993-01-16], l_recei
ptdate: [1993-01-10], l_shipinstruct: [DELIVER IN PERSON], l_shipmode: [AIR], l_comment: [ayers wake carefully a]
l_orderkey: [226], l_partkey: [407], l_suppkey: [95], l_linenumber: [4], l_quantity: [45], l_extendedprice: [58833], l_discount: [0.1], l_tax: [0.02], l_returnflag: [R], l_linestatus: [F], l_shipdate: [1993-04-17], l_commitdate: [1993-05-27], l_receiptd
ate: [1993-05-11], l_shipinstruct: [DELIVER IN PERSON], l_shipmode: [AIR], l_comment: [ carefully pending pi]
l_orderkey: [258], l_partkey: [1465], l_suppkey: [5], l_linenumber: [6], l_quantity: [36], l_extendedprice: [49192.6], l_discount: [0.09], l_tax: [0.04], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1994-01-11], l_commitdate: [1994-03-04], l_recei
ptdate: [1994-01-18], l_shipinstruct: [DELIVER IN PERSON], l_shipmode: [AIR], l_comment: [nic asymptotes. slyly silent r]
l_orderkey: [261], l_partkey: [1740], l_suppkey: [25], l_linenumber: [3], l_quantity: [28], l_extendedprice: [45968.7], l_discount: [0.08], l_tax: [0.03], l_returnflag: [R], l_linestatus: [F], l_shipdate: [1993-07-24], l_commitdate: [1993-08-20], l_rece
iptdate: [1993-08-05], l_shipinstruct: [COLLECT COD], l_shipmode: [AIR], l_comment: [ironic packages nag slyly. carefully fin]
l_orderkey: [261], l_partkey: [970], l_suppkey: [5], l_linenumber: [6], l_quantity: [20], l_extendedprice: [37419.4], l_discount: [0.06], l_tax: [0.06], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1993-10-15], l_commitdate: [1993-09-05], l_receip
tdate: [1993-11-07], l_shipinstruct: [NONE], l_shipmode: [AIR], l_comment: [ing to the special, ironic deposi]
l_orderkey: [294], l_partkey: [597], l_suppkey: [88], l_linenumber: [1], l_quantity: [31], l_extendedprice: [46425.3], l_discount: [0], l_tax: [0.01], l_returnflag: [R], l_linestatus: [F], l_shipdate: [1993-08-06], l_commitdate: [1993-08-19], l_receiptd
ate: [1993-08-13], l_shipinstruct: [TAKE BACK RETURN], l_shipmode: [AIR], l_comment: [le fluffily along the quick]
l_orderkey: [295], l_partkey: [914], l_suppkey: [17], l_linenumber: [2], l_quantity: [26], l_extendedprice: [47107.7], l_discount: [0.04], l_tax: [0.03], l_returnflag: [R], l_linestatus: [F], l_shipdate: [1994-12-13], l_commitdate: [1994-11-30], l_recei
ptdate: [1995-01-06], l_shipinstruct: [DELIVER IN PERSON], l_shipmode: [AIR], l_comment: [ts above the slyly regular requests x-ray q]
l_orderkey: [322], l_partkey: [1833], l_suppkey: [77], l_linenumber: [4], l_quantity: [10], l_extendedprice: [17348.3], l_discount: [0.06], l_tax: [0.03], l_returnflag: [R], l_linestatus: [F], l_shipdate: [1992-04-12], l_commitdate: [1992-05-13], l_rece
iptdate: [1992-04-14], l_shipinstruct: [DELIVER IN PERSON], l_shipmode: [AIR], l_comment: [ deposits grow slyly according to th]
l_orderkey: [322], l_partkey: [334], l_suppkey: [91], l_linenumber: [6], l_quantity: [3], l_extendedprice: [3702.99], l_discount: [0.08], l_tax: [0.05], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1992-07-03], l_commitdate: [1992-05-10], l_receip
tdate: [1992-07-28], l_shipinstruct: [NONE], l_shipmode: [AIR], l_comment: [ending, ironic deposits along the blith]
l_orderkey: [327], l_partkey: [418], l_suppkey: [48], l_linenumber: [2], l_quantity: [9], l_extendedprice: [11865.7], l_discount: [0.09], l_tax: [0.05], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1995-05-24], l_commitdate: [1995-07-11], l_receip
tdate: [1995-06-05], l_shipinstruct: [NONE], l_shipmode: [AIR], l_comment: [ asymptotes are fu]
l_orderkey: [353], l_partkey: [1194], l_suppkey: [67], l_linenumber: [1], l_quantity: [41], l_extendedprice: [44902.8], l_discount: [0], l_tax: [0.06], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1994-03-25], l_commitdate: [1994-03-31], l_receipt
date: [1994-03-30], l_shipinstruct: [DELIVER IN PERSON], l_shipmode: [AIR], l_comment: [refully final theodoli]
l_orderkey: [416], l_partkey: [1742], l_suppkey: [85], l_linenumber: [3], l_quantity: [25], l_extendedprice: [41093.5], l_discount: [0.07], l_tax: [0.01], l_returnflag: [R], l_linestatus: [F], l_shipdate: [1993-10-16], l_commitdate: [1993-12-03], l_rece
```

master* 0 61 0 0 (gdb) Launch (database-systems-implementation)   Ln 107, Col 1 (156 selected) Tab Size: 4 UTF-8 LF Plain Text

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l_orderkey: [226], l_partkey: [407], l_suppkey: [95], l_linenumber: [4], l_quantity: [45], l_extendedprice: [58833], l_discount: [0.1], l_tax: [0.02], l_returnflag: [R], l_linestatus: [F], l_shipdate: [1993-04-17], l_commitdate: [1993-05-27], l_receiptd
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iptdate: [1993-08-05], l_shipinstruct: [COLLECT COD], l_shipmode: [AIR], l_comment: [ironic packages nag slyly. carefully fin]
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l_orderkey: [294], l_partkey: [597], l_suppkey: [88], l_linenumber: [1], l_quantity: [31], l_extendedprice: [46425.3], l_discount: [0], l_tax: [0.01], l_returnflag: [R], l_linestatus: [F], l_shipdate: [1993-08-06], l_commitdate: [1993-08-19], l_receiptd
ate: [1993-08-13], l_shipinstruct: [TAKE BACK RETURN], l_shipmode: [AIR], l_comment: [le fluffily along the quick]
l_orderkey: [295], l_partkey: [914], l_suppkey: [17], l_linenumber: [2], l_quantity: [26], l_extendedprice: [47187.7], l_discount: [0.04], l_tax: [0.03], l_returnflag: [R], l_linestatus: [F], l_shipdate: [1994-12-13], l_commitdate: [1994-11-30], l_recei
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l_orderkey: [322], l_partkey: [1833], l_suppkey: [77], l_linenumber: [4], l_quantity: [10], l_extendedprice: [17348.3], l_discount: [0.06], l_tax: [0.03], l_returnflag: [R], l_linestatus: [F], l_shipdate: [1992-04-12], l_commitdate: [1992-05-13], l_rece
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tdate: [1992-07-28], l_shipinstruct: [NONE], l_shipmode: [AIR], l_comment: [ending, ironic deposits along the blith]
l_orderkey: [327], l_partkey: [418], l_suppkey: [48], l_linenumber: [2], l_quantity: [9], l_extendedprice: [11865.7], l_discount: [0.09], l_tax: [0.05], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1995-05-24], l_commitdate: [1995-07-11], l_receip
tdate: [1995-06-05], l_shipinstruct: [NONE], l_shipmode: [AIR], l_comment: [ asymptotes are fu]
l_orderkey: [353], l_partkey: [1194], l_suppkey: [67], l_linenumber: [1], l_quantity: [41], l_extendedprice: [44902.8], l_discount: [0], l_tax: [0.06], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1994-03-25], l_commitdate: [1994-03-31], l_receipt
date: [1994-03-30], l_shipinstruct: [DELIVER IN PERSON], l_shipmode: [AIR], l_comment: [refully final theodoli]
l_orderkey: [416], l_partkey: [1742], l_suppkey: [85], l_linenumber: [3], l_quantity: [25], l_extendedprice: [41093.5], l_discount: [0.07], l_tax: [0.01], l_returnflag: [R], l_linestatus: [F], l_shipdate: [1993-10-16], l_commitdate: [1993-12-03], l_rece
iptdate: [1993-10-29], l_shipinstruct: [NONE], l_shipmode: [AIR], l_comment: [ses boost after the bold requests.]
l_orderkey: [450], l_partkey: [781], l_suppkey: [82], l_linenumber: [5], l_quantity: [2], l_extendedprice: [3363.56], l_discount: [0.09], l_tax: [0], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1995-03-11], l_commitdate: [1995-05-21], l_receiptda
te: [1995-03-16], l_shipinstruct: [COLLECT COD], l_shipmode: [AIR], l_comment: [y even pinto beans; qui]
l_orderkey: [481], l_partkey: [207], l_suppkey: [8], l_linenumber: [2], l_quantity: [19], l_extendedprice: [21036.8], l_discount: [0.08], l_tax: [0.01], l_returnflag: [R], l_linestatus: [F], l_shipdate: [1993-01-09], l_commitdate: [1992-11-27], l_receip
tdate: [1993-01-14], l_shipinstruct: [TAKE BACK RETURN], l_shipmode: [AIR], l_comment: [p blithely after t]
l_orderkey: [481], l_partkey: [1120], l_suppkey: [93], l_linenumber: [5], l_quantity: [31], l_extendedprice: [31654.7], l_discount: [0.05], l_tax: [0.01], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1993-01-15], l_commitdate: [1992-12-31], l_rece
iptdate: [1993-01-21], l_shipinstruct: [DELIVER IN PERSON], l_shipmode: [AIR], l_comment: [usly final packages believe. quick]
l_orderkey: [548], l_partkey: [568], l_suppkey: [59], l_linenumber: [4], l_quantity: [21], l_extendedprice: [30839.8], l_discount: [0.08], l_tax: [0.03], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1994-10-27], l_commitdate: [1994-12-04], l_recei
ptdate: [1994-11-21], l_shipinstruct: [DELIVER IN PERSON], l_shipmode: [AIR], l_comment: [ engage quickly. regular theo]
l_orderkey: [549], l_partkey: [653], l_suppkey: [54], l_linenumber: [3], l_quantity: [36], l_extendedprice: [55931.4], l_discount: [0.08], l_tax: [0.04], l_returnflag: [R], l_linestatus: [F], l_shipdate: [1992-09-11], l_commitdate: [1992-10-11], l_recei
ptdate: [1992-09-12], l_shipinstruct: [DELIVER IN PERSON], l_shipmode: [AIR], l_comment: [ts against the ironic, even theodolites eng]
l_orderkey: [577], l_partkey: [259], l_suppkey: [14], l_linenumber: [1], l_quantity: [25], l_extendedprice: [28981.2], l_discount: [0.06], l_tax: [0.01], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1995-04-09], l_commitdate: [1995-02-20], l_recei
ptdate: [1995-05-09], l_shipinstruct: [TAKE BACK RETURN], l_shipmode: [AIR], l_comment: [ve slyly of the frets. careful]
l_orderkey: [677], l_partkey: [1497], l_suppkey: [15], l_linenumber: [5], l_quantity: [25], l_extendedprice: [34962.2], l_discount: [0], l_tax: [0.05], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1994-03-12], l_commitdate: [1994-02-02], l_receipt
date: [1994-03-20], l_shipinstruct: [DELIVER IN PERSON], l_shipmode: [AIR], l_comment: [ packages integrate blithely]
l_orderkey: [678], l_partkey: [975], l_suppkey: [76], l_linenumber: [5], l_quantity: [20], l_extendedprice: [30015.5], l_discount: [0.06], l_tax: [0.04], l_returnflag: [R], l_linestatus: [F], l_shipdate: [1993-03-09], l_commitdate: [1993-04-18], l_recei
ptdate: [1993-04-07], l_shipinstruct: [NONE], l_shipmode: [AIR], l_comment: [ about the ]
l_orderkey: [738], l_partkey: [1871], l_suppkey: [72], l_linenumber: [2], l_quantity: [4], l_extendedprice: [7091.48], l_discount: [0], l_tax: [0.03], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1993-06-20], l_commitdate: [1993-04-08], l_receiptd
ate: [1993-07-09], l_shipinstruct: [NONE], l_shipmode: [AIR], l_comment: [ar packages. fluffily bo]
l_orderkey: [738], l_partkey: [1749], l_suppkey: [34], l_linenumber: [5], l_quantity: [30], l_extendedprice: [49522.2], l_discount: [0.02], l_tax: [0], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1993-06-12], l_commitdate: [1993-05-29], l_receipt
date: [1993-06-25], l_shipinstruct: [NONE], l_shipmode: [AIR], l_comment: [ecial instructions haggle blithely regula]
l_orderkey: [742], l_partkey: [1919], l_suppkey: [64], l_linenumber: [4], l_quantity: [16], l_extendedprice: [29134.6], l_discount: [0.01], l_tax: [0.05], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1995-01-15], l_commitdate: [1995-02-25], l_rece
iptdate: [1995-01-24], l_shipinstruct: [COLLECT COD], l_shipmode: [AIR], l_comment: [eodolites haggle carefully regul]
l_orderkey: [769], l_partkey: [1751], l_suppkey: [94], l_linenumber: [1], l_quantity: [36], l_extendedprice: [59499], l_discount: [0.02], l_tax: [0.02], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1993-10-01], l_commitdate: [1993-08-07], l_receip
tdate: [1993-10-15], l_shipinstruct: [NONE], l_shipmode: [AIR], l_comment: [es. furiously iro]
l_orderkey: [772], l_partkey: [1799], l_suppkey: [26], l_linenumber: [4], l_quantity: [10], l_extendedprice: [17007.9], l_discount: [0.08], l_tax: [0.02], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1993-05-17], l_commitdate: [1993-06-09], l_rece
iptdate: [1993-05-29], l_shipinstruct: [COLLECT COD], l_shipmode: [AIR], l_comment: [ o the furiously final deposits. furi]
l_orderkey: [801], l_partkey: [947], l_suppkey: [16], l_linenumber: [2], l_quantity: [21], l_extendedprice: [38806.7], l_discount: [0.05], l_tax: [0.02], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1992-03-14], l_commitdate: [1992-04-01], l_recei
ptdate: [1992-04-05], l_shipinstruct: [COLLECT COD], l_shipmode: [AIR], l_comment: [wake silently furiously idle deposits. ]
l_orderkey: [802], l_partkey: [1328], l_suppkey: [29], l_linenumber: [2], l_quantity: [34], l_extendedprice: [41796.9], l_discount: [0.08], l_tax: [0.06], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1995-03-01], l_commitdate: [1995-03-15], l_rece
iptdate: [1995-03-12], l_shipinstruct: [COLLECT COD], l_shipmode: [AIR], l_comment: [instructions cajole carefully. quietl]
l_orderkey: [866], l_partkey: [1358], l_suppkey: [59], l_linenumber: [1], l_quantity: [5], l_extendedprice: [6296.75], l_discount: [0.08], l_tax: [0], l_returnflag: [R], l_linestatus: [F], l_shipdate: [1993-01-22], l_commitdate: [1993-01-14], l_receiptd
ate: [1993-02-07], l_shipinstruct: [TAKE BACK RETURN], l_shipmode: [AIR], l_comment: [tegrate fluffily. carefully f]
l_orderkey: [928], l_partkey: [104], l_suppkey: [31], l_linenumber: [7], l_quantity: [11], l_extendedprice: [11045.1], l_discount: [0], l_tax: [0.01], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1995-04-29], l_commitdate: [1995-04-16], l_receiptd
ate: [1995-04-30], l_shipinstruct: [NONE], l_shipmode: [AIR], l_comment: [longside of]
l_orderkey: [930], l_partkey: [173], l_suppkey: [52], l_linenumber: [2], l_quantity: [47], l_extendedprice: [50439], l_discount: [0.08], l_tax: [0], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1995-03-20], l_commitdate: [1995-02-04], l_receiptdat
e: [1995-04-04], l_shipinstruct: [DELIVER IN PERSON], l_shipmode: [AIR], l_comment: [ackages. fluffily e]
l_orderkey: [933], l_partkey: [992], l_suppkey: [27], l_linenumber: [3], l_quantity: [26], l_extendedprice: [49217.7], l_discount: [0.05], l_tax: [0], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1992-11-09], l_commitdate: [1992-11-03], l_receiptd
ate: [1992-11-16], l_shipinstruct: [DELIVER IN PERSON], l_shipmode: [AIR], l_comment: [ the deposits affix slyly after t]
l_orderkey: [960], l_partkey: [1070], l_suppkey: [6], l_linenumber: [1], l_quantity: [1], l_extendedprice: [971.07], l_discount: [0.07], l_tax: [0], l_returnflag: [A], l_linestatus: [F], l_shipdate: [1994-12-24], l_commitdate: [1994-10-26], l_receiptdat
e: [1995-01-20], l_shipinstruct: [DELIVER IN PERSON], l_shipmode: [AIR], l_comment: [y ironic packages. quickly even ]
 selected 35 recs
```

Q12 on lineitem for 1GB file return 2 records

```
[siddharth@siddharth-pc P1]$ ./test.out
catalog
** IMPORTANT: MAKE SURE THE INFORMATION BELOW IS CORRECT **
 catalog location:      catalog
 tpch files dir:        ../tpch-dbgen/
 heap files dir:        ../bin/


select test:
        1. load file
        2. scan
        3. scan & filter
        3

select table:
        1. nation
        2. region
        3. customer
        4. part
        5. partsupp
        6. orders
        7. lineitem
        7
 Filter with CNF for : lineitem
 Enter CNF predicate (when done press ctrl-D):
        (l_orderkey > 100) AND
(l_orderkey < 1000) AND
(l_partkey > 100) AND
(l_partkey < 5000) AND
(l_shipmode = 'AIR') AND
(l_linestatus = 'F') AND
(l_tax < 0.07)
../bin/lineitem.bin
l_orderkey: [130], l_partkey: [1739], l_suppkey: [4240], l_linenumber: [2], l_quantity: [48], l_extendedprice: [78755], l_discount: [0.03], l_tax: [0.02]
, l_returnflag: [R], l_linestatus: [F], l_shipdate: [1992-07-01], l_commitdate: [1992-07-12], l_receiptdate: [1992-07-24], l_shipinstruct: [NONE], l_ship
mode: [AIR], l_comment: [lithely alongside of the regu]
l_orderkey: [194], l_partkey: [2594], l_suppkey: [5095], l_linenumber: [1], l_quantity: [17], l_extendedprice: [25442], l_discount: [0.05], l_tax: [0.04]
, l_returnflag: [R], l_linestatus: [F], l_shipdate: [1992-05-24], l_commitdate: [1992-05-22], l_receiptdate: [1992-05-30], l_shipinstruct: [COLLECT COD],
 l_shipmode: [AIR], l_comment: [ regular deposi]
 selected 2 recs
```

Q1 on region for 10MB data return 1 record

```
[siddharth@siddharth-pc P1]$ ./test.out
catalog
** IMPORTANT: MAKE SURE THE INFORMATION BELOW IS CORRECT **
 catalog location:      catalog
 tpch files dir:        ../tpch-dbgen/
 heap files dir:        ../bin/

select test:
        1. load file
        2. scan
        3. scan & filter
        1

select table:
        1. nation
        2. region
        3. customer
        4. part
        5. partsupp
        6. orders
        7. lineitem
        2
 DBFile will be created at ../bin/region.bin
 tpch file will be loaded from ../tpch-dbgen/region.tbl
 Number of records loaded :5
```

```
[siddharth@siddharth-pc P1]$ ./test.out
catalog
** IMPORTANT: MAKE SURE THE INFORMATION BELOW IS CORRECT **
 catalog location:      catalog
 tpch files dir:        ../tpch-dbgen/
 heap files dir:        ../bin/


select test:
        1. load file
        2. scan
        3. scan & filter
        3

select table:
        1. nation
        2. region
        3. customer
        4. part
        5. partsupp
        6. orders
        7. lineitem
        2
 Filter with CNF for : region
 Enter CNF predicate (when done press ctrl-D):
        (r_name = 'EUROPE')
../bin/region.bin
r_regionkey: [3], r_name: [EUROPE], r_comment: [ly final courts cajole furiously final excuse]
 selected 1 recs
```

Q2 on region for 10MB file returns 3 records

```
[siddharth@siddharth-pc P1]$ ./test.out
catalog
** IMPORTANT: MAKE SURE THE INFORMATION BELOW IS CORRECT **
 catalog location:      catalog
 tpch files dir:        ../tpch-dbgen/
 heap files dir:        ../bin/


 select test:
        1. load file
        2. scan
        3. scan & filter
        3

 select table:
        1. nation
        2. region
        3. customer
        4. part
        5. partsupp
        6. orders
        7. lineitem
        2
 Filter with CNF for : region
 Enter CNF predicate (when done press ctrl-D):
        (r_name < 'middle east') AND
(r_regionkey > 1)
../bin/region.bin
r_regionkey: [2], r_name: [ASIA], r_comment: [ges. thinly even pinto beans ca]
r_regionkey: [3], r_name: [EUROPE], r_comment: [ly final courts cajole furiously final excuse]
r_regionkey: [4], r_name: [MIDDLE EAST], r_comment: [uickly special accounts cajole carefully blithely close requests. carefully final asymptotes haggle
furiousl]
 selected 3 recs
```

Q3 on nation for 10MB data

```
[siddharth@siddharth-pc P1]$ ./test.out
catalog
** IMPORTANT: MAKE SURE THE INFORMATION BELOW IS CORRECT **
 catalog location:      catalog
 tpch files dir:        ../tpch-dbgen/
 heap files dir:        ../bin/


 select test:
        1. load file
        2. scan
        3. scan & filter
        1

 select table:
        1. nation
        2. region
        3. customer
        4. part
        5. partsupp
        6. orders
        7. lineitem
        1
 DBFile will be created at ../bin/nation.bin
 tpch file will be loaded from ../tpch-dbgen/nation.tbl
 Number of records loaded :25
```

```
[siddharth@siddharth-pc P1]$ ./test.out
catalog
** IMPORTANT: MAKE SURE THE INFORMATION BELOW IS CORRECT **
 catalog location:      catalog
 tpch files dir:        ../tpch-dbgen/
 heap files dir:        ../bin/


 select test:
         1. load file
         2. scan
         3. scan & filter
         3

 select table:
         1. nation
         2. region
         3. customer
         4. part
         5. partsupp
         6. orders
         7. lineitem
         1
 Filter with CNF for : nation
 Enter CNF predicate (when done press ctrl-D):
         (n_regionkey = 3) AND
(n_nationkey > 10) AND
(n_name > 'japan')
../bin/nation.bin
 selected 0 recs
```

Code Documentation

```
DBFile::DBFile () {
```

This is a constructor method for DBFile, it initializes the state variables required inside the objects.

```
DBFile::~DBFile ()
```

This is a destructor method for DBFile. It is used to free up any memory initialized during execution.

```
int DBFile::Create (const char *f_path, fType f_type, void *startup)
```

This method creates the file on the path **f_path**. For now, only supported file type is **heap**, otherwise the method returns 0. Parameter **startup** is not implemented in this assignment.

```
void DBFile::MoveFirst ()
```

This method moves the pointer to the beginning of the file. It means that, it flushes out the data in the current **page** object and reads the first page from the file and stores in the **page** object.

```
void DBFile::Add (Record &rec)
```

This method is used to add **record** objects to the **page** object inside the DBFile. If the addition to the page method returns 0, then this method adds the current **page** object to the file object (which writes the data to the file on the disk) and flushes out the data in the **page** object, so that new records can be added to it. This method is not stateless, i.e. it depends on the state of the **page** object inside DBFile. This method only adds the **page** to the **file** if the page is full. Hence, it won't add the last page back to the file. You would have to manually do it.

```
int DBFile::Open (const char *f_path)
```

This method checks the path and calls **open** method of the **file** object.

```
void DBFile::Load (Schema &f_schema, const char *loadpath)
```

The main task of this method is to read the **.tbl** file and load the **bin** file with its contents. This method accepts a schema given in the catalog and the location to load the data.
It reads a single **record** from the file and calls the **Add** method for the read record (which adds it to the page and when page is full, it is appended to the file on disk), until it reaches the end of file.

```
int DBFile::GetNext (Record &fetchme)
```

This method reads the current state of **page** object and returns the and saves its reference in **fetchme** input parameter. If the retrieval was successful then the method return 1 otherwise 0. If the page object doesn't have any records, a new **page** is read from the file object and then its first **record** is returned.

```
int DBFile::GetNext (Record &fetchme, CNF &cnf, Record &literal)
```

This method reads the current state of **page** object and retrieves the **record** object from it. If If the page object doesn't have any records, a new **page** is read from the file object and then its first **record** is retrieved. Then the **cnf** parameter is applied the record, if the retrieved record matches the **cnf**, its reference is saved in **fetchme** with the returned int value as 1. If the retrieved record does not match **cnf**, 0 is returned.

```
int DBFile::Close ()
```

This function simply closes the file.