

# Project -1 Report

**(a) Group member:** Shibani Mahapatra (UFID: 7184-3505)

**(b) instructions on how to compile and run the code as well as a brief explanation of each method and how it works.**

Compile and run instructions:

```
make clean
make
make test.out
./test.out
```

For query q1:

Select option 1(load file) and then option 2(region)

Run

```
./test.out
```

again

Select option 3 and enter the query to get the result

Similarly do for other queries accordingly.

For running gTest:

```
make gtest.out
./gtest.out
```

Select from options accordingly

Brief explanations of the methods:

DBFile::Create()

Tells the type of the file, currently it works with heap. Returns 1 on success

DBFile:: Load()

Loads DBFile instance from a text file and appends new data to it using SuckNextRecord() function from Record.h

DBFile::Open()

Returns 1 if file exist and opens the file

DBFile::MoveFirst()

Moves pointer to the given record

DBFile::Close()

Closes the file. Returns 1 for success

DBFile::Add()

Appends records to the file

DBFile::GetNext(Record &fetchMe)

Points to current record. Increments after every call.

DBFile::GetNext(Record &fetchMe, CNF &applyMe, Record &literal)

Uses CNF to find the next record in the file

Gtest::TEST()

Testcases for expected output for an given input

### (c) Screenshots of queries (One in each page)

q1 (r\_name = 'EUROPE')

```
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')
selected 0 rows
(base) Shibani-MBP:PI 2 shibanimahapatra$ ./test.out

** IMPORTANT: MAKE SURE THE INFORMATION BELOW IS CORRECT **
catalog location: catalog
tpch files dir: /Users/shibanimahapatra/Documents/Graduate - UFL/Sem 2 Spring 2020/DB1/Project/PI 2/
heap files dir:

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 region.bin
tpch file will be loaded from /Users/shibanimahapatra/Documents/Graduate - UFL/Sem 2 Spring 2020/DB1/Project/PI 2/region.tbl
(base) Shibani-MBP:PI 2 shibanimahapatra$ ./test.out

** IMPORTANT: MAKE SURE THE INFORMATION BELOW IS CORRECT **
catalog location: catalog
tpch files dir: /Users/shibanimahapatra/Documents/Graduate - UFL/Sem 2 Spring 2020/DB1/Project/PI 2/
heap files dir:

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')
r_regionkey: [3], r_name: [EUROPE], r_comment: [ly final courts cajole furiously final excuse]
selected 1 rows
(base) Shibani-MBP:PI 2 shibanimahapatra$
```

## q2 (r\_name < 'middle east') AND (r\_regionkey > 1)

```
tech file will be loaded from /Users/shibanimahapatra/Documents/Graduate - UFL/Sem 2 Spring 2020/DB1/Project/P1 2/region.tbl
(base) Shibanis-MBP:P1 2 shibanimahapatra$ ./test.out

** IMPORTANT: MAKE SURE THE INFORMATION BELOW IS CORRECT **
catalog location:    catalog
tpch files dir:      /Users/shibanimahapatra/Documents/Graduate - UFL/Sem 2 Spring 2020/DB1/Project/P1 2/
heap files dir:

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')
r_regionkey: [3], r_name: [EUROPE], r_comment: [ly final courts cajole furiously final excuse]
selected 1 recs
(base) Shibanis-MBP:P1 2 shibanimahapatra$ ./test.out

** IMPORTANT: MAKE SURE THE INFORMATION BELOW IS CORRECT **
catalog location:    catalog
tpch files dir:      /Users/shibanimahapatra/Documents/Graduate - UFL/Sem 2 Spring 2020/DB1/Project/P1 2/
heap files dir:

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)
r_regionkey: [2], r_name: [ASIA], r_comment: [ges. thinly even pinto beans co]
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 haggie furiousl]
selected 3 recs
(base) Shibanis-MBP:P1 2 shibanimahapatra$ █
```

q3 (n\_regionkey = 3) AND (n\_nationkey > 10) AND (n\_name > 'japan')

```
delete s, p, ps, n, li, r, o, c;
^
7 warnings generated.
g++ -O2 -Wno-deprecated -o test.out Record.o ComparisonEngine.o Schema.o File.o DBFile.o y.tab.o lex.yy.o test.o -ll
(base) Shibanis-MBP:P1 2 shibanimahapatra$ make test.out
make: 'test.out' is up to date.
(base) Shibanis-MBP:P1 2 shibanimahapatra$ ./test.out

** IMPORTANT: MAKE SURE THE INFORMATION BELOW IS CORRECT **
catalog location:    catalog
tpch files dir:      /Users/shibanimahapatra/Documents/Graduate - UFL/Sem 2 Spring 2020/DBI/Project/P1 2/
heap files dir:

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 nation.bin
tpch file will be loaded from /Users/shibanimahapatra/Documents/Graduate - UFL/Sem 2 Spring 2020/DBI/Project/P1 2/nation.tbl
(base) Shibanis-MBP:P1 2 shibanimahapatra$ ./test.out

** IMPORTANT: MAKE SURE THE INFORMATION BELOW IS CORRECT **
catalog location:    catalog
tpch files dir:      /Users/shibanimahapatra/Documents/Graduate - UFL/Sem 2 Spring 2020/DBI/Project/P1 2/
heap files dir:

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')
selected 0 rows
(base) Shibanis-MBP:P1 2 shibanimahapatra$
```

q11

(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)

```
r_regionkey: [2], r_name: [ASIA], r_comment: [ges. thinly even pisto beans co]
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
(base) Shibanis-MBP:P1 2 shibanimahapatra$ ./test.out

** IMPORTANT: MAKE SURE THE INFORMATION BELOW IS CORRECT **
catalog location:    catalog
tpch files dir:     /Users/shibanimahapatra/Documents/Graduate - UFL/Sem 2 Spring 2020/DBI/Project/P1 2/
heap files dir:

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
  7
DBfile will be created at lineitem bin
tpch file will be loaded from /Users/shibanimahapatra/Documents/Graduate - UFL/Sem 2 Spring 2020/DBI/Project/P1 2/lineitem.tbl
(base) Shibanis-MBP:P1 2 shibanimahapatra$ ./test.out

** IMPORTANT: MAKE SURE THE INFORMATION BELOW IS CORRECT **
catalog location:    catalog
tpch files dir:     /Users/shibanimahapatra/Documents/Graduate - UFL/Sem 2 Spring 2020/DBI/Project/P1 2/
heap files dir:

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)
selected 0 recs
(base) Shibanis-MBP:P1 2 shibanimahapatra$
```

```
(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)
```

```

(0ase) Shibanis-MBP:PI 2 shibanahapatras /test/oc
** IMPORTANT: MAKE SURE THE INFORMATION BELOW IS CORRECT **
catalog location: catalog
tch files dir: /Users/shibanahapatras/Documents/Graduate - UFL/Sem 2 Spring 2020/D61/Project/PI 2/
heap files dir:

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.portkey > 100) AND
(L.portkey < 5000) AND
(L.shipmode = 'AIR') AND
(L.linestatus = 'F') AND
(L.ttax < 0.07)

L.orderkey: [332], L.portkey: [281], L.suppkey: [63], L.linenumber: [4], L.quantity: [23], L.extendedprice: [27269.4], L.discount: [0.1], L.ttax: [0], L.returnflag: [A], L.linestatus: [F], L.shipdate: [1993-06-16], L.committedate: [1993-06-16]
L.orderkey: [185], L.suppkey: [38], L.linenumber: [2], L.quantity: [24], L.extendedprice: [26044.3], L.discount: [0.05], L.ttax: [0.05], L.returnflag: [X], L.linestatus: [F], L.shipdate: [1992-12-22], L.committedate: [1992-12-22]
L.orderkey: [11-27], L.orderprice: [1993-01-06], L.shipinstruct: [NONE], L.shipmode: [AIR], L.comment: [side of the silyly unusual theodolites. f]
L.orderkey: [164], L.suppkey: [1256], L.suppkey: [68], L.linenumber: [3], L.quantity: [38], L.extendedprice: [43975.5], L.discount: [0.3], L.ttax: [0.06], L.returnflag: [X], L.linestatus: [F], L.shipdate: [1992-12-04], L.committedate: [1992-12-04]
L.orderkey: [11-23], L.orderprice: [1993-01-02], L.shipinstruct: [TAKE BACK RETURN], L.shipmode: [AIR], L.comment: [counts cable fluffy regular packages. b]
L.orderkey: [164], L.suppkey: [1809], L.suppkey: [90], L.linenumber: [6], L.quantity: [27], L.extendedprice: [26732.2], L.discount: [0.1], L.ttax: [0.04], L.returnflag: [X], L.linestatus: [F], L.shipdate: [1992-12-23], L.committedate: [1992-12-23]
L.orderkey: [01-16], L.orderprice: [1993-01-10], L.shipinstruct: [DELIVER IN PERSON], L.shipmode: [AIR], L.comment: [cays wide carefully q]
L.orderkey: [226], L.suppkey: [407], L.suppkey: [95], L.linenumber: [4], L.quantity: [45], L.extendedprice: [58833], L.discount: [0.1], L.ttax: [0.02], L.returnflag: [X], L.linestatus: [F], L.shipdate: [1993-04-17], L.committedate: [1993-04-17]
L.orderkey: [27], L.orderprice: [1993-05-11], L.shipinstruct: [DELIVER IN PERSON], L.shipmode: [AIR], L.comment: [caefully pending pi]
L.orderkey: [258], L.suppkey: [1465], L.suppkey: [5], L.linenumber: [6], L.quantity: [36], L.extendedprice: [43932.6], L.discount: [0.09], L.ttax: [0.03], L.returnflag: [A], L.linestatus: [F], L.shipdate: [1994-01-11], L.committedate: [1994-01-11]
L.orderkey: [83-04], L.orderprice: [1994-01-05], L.shipinstruct: [DELIVER IN PERSON], L.shipmode: [AIR], L.comment: [nic asymptotes, silyly silent p]
L.orderkey: [261], L.suppkey: [1740], L.suppkey: [13], L.linenumber: [3], L.quantity: [28], L.extendedprice: [49684.7], L.discount: [0.08], L.ttax: [0.03], L.returnflag: [X], L.linestatus: [F], L.shipdate: [1993-07-24], L.committedate: [1993-07-24]
L.orderkey: [8-20], L.orderprice: [1993-08-05], L.shipinstruct: [COLLECT COO], L.shipmode: [AIR], L.comment: [ironic packages now silyly carefully fin]
L.orderkey: [261], L.suppkey: [700], L.suppkey: [5], L.linenumber: [6], L.quantity: [20], L.extendedprice: [37419.4], L.discount: [0.06], L.ttax: [0.06], L.returnflag: [A], L.linestatus: [F], L.shipdate: [1993-10-15], L.committedate: [1993-10-15]
L.orderkey: [9-05], L.orderprice: [1993-11-07], L.shipinstruct: [NONE], L.shipmode: [AIR], L.comment: [ing to the special, ironic deposit]
L.orderkey: [19], L.orderprice: [1993-08-13], L.shipinstruct: [TAKE BACK RETURN], L.shipmode: [AIR], L.comment: [le fluffy along the quik]
L.orderkey: [295], L.suppkey: [914], L.suppkey: [17], L.linenumber: [2], L.quantity: [26], L.extendedprice: [47187.7], L.discount: [0.04], L.ttax: [0.03], L.returnflag: [X], L.linestatus: [F], L.shipdate: [1994-12-13], L.committedate: [1994-12-13]
L.orderkey: [11-30], L.orderprice: [1995-01-06], L.shipinstruct: [DELIVER IN PERSON], L.shipmode: [AIR], L.comment: [ts above the silyly regular requests x-ray a]
L.orderkey: [322], L.suppkey: [1833], L.suppkey: [77], L.linenumber: [4], L.quantity: [18], L.extendedprice: [17548.3], L.discount: [0.00], L.ttax: [0.03], L.returnflag: [X], L.linestatus: [F], L.shipdate: [1992-04-12], L.committedate: [1992-04-12]
L.orderkey: [322], L.suppkey: [334], L.suppkey: [91], L.linenumber: [6], L.quantity: [3], L.extendedprice: [3702.99], L.discount: [0.08], L.ttax: [0.05], L.returnflag: [A], L.linestatus: [F], L.shipdate: [1992-07-03], L.committedate: [1992-07-03]
L.orderkey: [5-10], L.orderprice: [1992-07-28], L.shipinstruct: [NONE], L.shipmode: [AIR], L.comment: [ending, ironic deposits along the blith]
L.orderkey: [327], L.suppkey: [418], L.suppkey: [48], L.linenumber: [2], L.quantity: [9], L.extendedprice: [11855.7], L.discount: [0.09], L.ttax: [0.05], L.returnflag: [A], L.linestatus: [F], L.shipdate: [1995-05-24], L.committedate: [1995-05-24]
L.orderkey: [7-11], L.orderprice: [1995-06-05], L.shipinstruct: [NONE], L.shipmode: [AIR], L.comment: [asymptotes are fu]
L.orderkey: [261], L.suppkey: [1740], L.suppkey: [13], L.linenumber: [3], L.quantity: [28], L.extendedprice: [49684.8], L.discount: [0.08], L.ttax: [0.03], L.returnflag: [X], L.linestatus: [F], L.shipdate: [1993-07-24], L.committedate: [1993-07-24]
L.orderkey: [8-20], L.orderprice: [1993-08-05], L.shipinstruct: [COLLECT COO], L.shipmode: [AIR], L.comment: [ironic packages now silyly carefully fin]
L.orderkey: [261], L.suppkey: [700], L.suppkey: [5], L.linenumber: [6], L.quantity: [20], L.extendedprice: [37419.4], L.discount: [0.06], L.ttax: [0.06], L.returnflag: [A], L.linestatus: [F], L.shipdate: [1993-10-15], L.committedate: [1993-10-15]
L.orderkey: [9-05], L.orderprice: [1993-11-07], L.shipinstruct: [NONE], L.shipmode: [AIR], L.comment: [ing to the special, ironic deposit]
L.orderkey: [19], L.orderprice: [1993-08-13], L.shipinstruct: [TAKE BACK RETURN], L.shipmode: [AIR], L.comment: [le fluffy along the quik]
L.orderkey: [295], L.suppkey: [914], L.suppkey: [17], L.linenumber: [2], L.quantity: [26], L.extendedprice: [47187.7], L.discount: [0.04], L.ttax: [0.03], L.returnflag: [X], L.linestatus: [F], L.shipdate: [1994-12-13], L.committedate: [1994-12-13]
L.orderkey: [11-30], L.orderprice: [1995-01-06], L.shipinstruct: [DELIVER IN PERSON], L.shipmode: [AIR], L.comment: [ts above the silyly regular requests x-ray a]
L.orderkey: [322], L.suppkey: [1833], L.suppkey: [77], L.linenumber: [4], L.quantity: [18], L.extendedprice: [17548.3], L.discount: [0.00], L.ttax: [0.03], L.returnflag: [X], L.linestatus: [F], L.shipdate: [1992-04-12], L.committedate: [1992-04-12]
L.orderkey: [83-13], L.orderprice: [1992-04-14], L.shipinstruct: [DELIVER IN PERSON], L.shipmode: [AIR], L.comment: [deposits grow silyly according to q]
L.orderkey: [322], L.suppkey: [334], L.suppkey: [91], L.linenumber: [6], L.quantity: [3], L.extendedprice: [3702.99], L.discount: [0.08], L.ttax: [0.05], L.returnflag: [A], L.linestatus: [F], L.shipdate: [1992-07-03], L.committedate: [1992-07-03]
L.orderkey: [5-10], L.orderprice: [1992-07-28], L.shipinstruct: [NONE], L.shipmode: [AIR], L.comment: [ending, ironic deposits along the blith]
L.orderkey: [327], L.suppkey: [418], L.suppkey: [48], L.linenumber: [2], L.quantity: [9], L.extendedprice: [11855.7], L.discount: [0.09], L.ttax: [0.05], L.returnflag: [A], L.linestatus: [F], L.shipdate: [1995-05-24], L.committedate: [1995-05-24]
L.orderkey: [7-11], L.orderprice: [1995-06-05], L.shipinstruct: [NONE], L.shipmode: [AIR], L.comment: [asymptotes are fu]
L.orderkey: [261], L.suppkey: [1740], L.suppkey: [13], L.linenumber: [3], L.quantity: [28], L.extendedprice: [49684.8], L.discount: [0.08], L.ttax: [0.03], L.returnflag: [X], L.linestatus: [F], L.shipdate: [1993-07-24], L.committedate: [1993-07-24]
L.orderkey: [8-20], L.orderprice: [1993-08-05], L.shipinstruct: [COLLECT COO], L.shipmode: [AIR], L.comment: [ironic packages now silyly carefully fin]
L.orderkey: [261], L.suppkey: [700], L.suppkey: [5], L.linenumber: [6], L.quantity: [20], L.extendedprice: [37419.4], L.discount: [0.06], L.ttax: [0.06], L.returnflag: [A], L.linestatus: [F], L.shipdate: [1993-10-15], L.committedate: [1993-10-15]
L.orderkey: [9-05], L.orderprice: [1993-11-07], L.shipinstruct: [NONE], L.shipmode: [AIR], L.comment: [ing to the special, ironic deposit]
L.orderkey: [19], L.orderprice: [1993-08-13], L.shipinstruct: [TAKE BACK RETURN], L.shipmode: [AIR], L.comment: [le fluffy along the quik]
L.orderkey: [295], L.suppkey: [914], L.suppkey: [17], L.linenumber: [2], L.quantity: [26], L.extendedprice: [47187.7], L.discount: [0.04], L.ttax: [0.03], L.returnflag: [X], L.linestatus: [F], L.shipdate: [1994-12-13], L.committedate: [1994-12-13]
L.orderkey: [11-30], L.orderprice: [1995-01-06], L.shipinstruct: [DELIVER IN PERSON], L.shipmode: [AIR], L.comment: [ts above the silyly regular requests x-ray a]
L.orderkey: [
```

## (d) Screenshot gTest results:

```
Select the table to test:
1.Nation
2.Region
3.Customer
4.Part
5.Partsupp
6.Orders
7.Lineitem
1
[=====] Running 3 tests from 1 test suite.
[-----] Global test environment set-up.
[-----] 3 tests from DBFileTest
[ RUN      ] DBFileTest.Create
BAD! Open did not work for bin/nation.bin
(base) Shibanis-MacBook-Pro:PI 2 shibanimahapatra$ ./gtest.out

** IMPORTANT: MAKE SURE THE INFORMATION BELOW IS CORRECT **
catalog location:    catalog
tpch files dir:      tpch-dbggen/
heap files dir:      bin/

Select the table to test:
1.Nation
2.Region
3.Customer
4.Part
5.Partsupp
6.Orders
7.Lineitem
2
[=====] Running 3 tests from 1 test suite.
[-----] Global test environment set-up.
[-----] 3 tests from DBFileTest
[ RUN      ] DBFileTest.Create
BAD! Open did not work for bin/region.bin
(base) Shibanis-MacBook-Pro:PI 2 shibanimahapatra$ ./gtest.out

** IMPORTANT: MAKE SURE THE INFORMATION BELOW IS CORRECT **
catalog location:    catalog
tpch files dir:      tpch-dbggen/
heap files dir:      bin/

Select the table to test:
1.Nation
2.Region
3.Customer
4.Part
5.Partsupp
6.Orders
7.Lineitem
7
[=====] Running 3 tests from 1 test suite.
[-----] Global test environment set-up.
[-----] 3 tests from DBFileTest
[ RUN      ] DBFileTest.Create
BAD! Open did not work for bin/lineitem.bin
(base) Shibanis-MacBook-Pro:PI 2 shibanimahapatra$
```