

Project Report

Group members:

Name- Shubham Saoji

Ufid- 26364957

Name: Rohit Karumuri

UFID: 90971158

How to run project:

Change the addresses of the tbl files in test.h

`make clean` //to remove compiled files

`make` //to compile all files

`make test.out` //to compile test.out

`cat ./output.txt` //to view output file

`make gtest` //to compile google test cases

`./gtest` to run test cases

BigQ Class and Methods:

BigQ Class consists of class members:

- `in` – For input pipe
- `out` – For output pipe
- `sortorder` – keeps sorting rule
- `runlen` – number of pages in each run

Other Helper Classes:

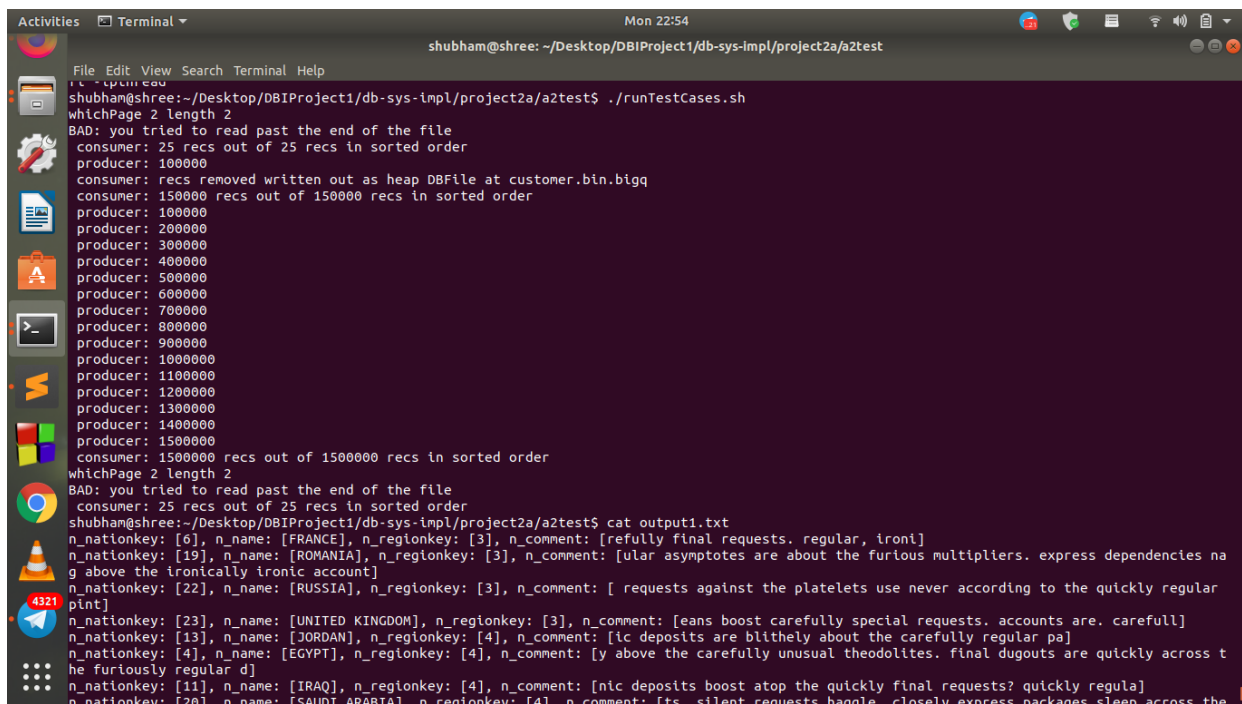
- `RecordTracker` – to track record and pages
- `ThreadData` – Passes pipe, sortorder and runlength data in threads

Methods implementing BigQ:

- `compareHeap` – This method is used to compare 2 records. Returns true if `arg1` is greater else false.
- `compareRecord` – Used to compare two Records. Returns true if the Record passed in `argument1` is less than the Record passed in `argument 2` else returns false.
- `mergingProcessOnPages` – We use `compareHeap` and implements a vector on each run and merges the records using the vector

- eSorting – This is the main logic for sorting of the process. It contains pipeFilled which checks if data is present in the pipeline. It uses compareRecord to compare the records. This function also takes pages to temporary.bin for a short period and then these pages are taken to be sorted

Screenshots of output.txt on 1Gb data:



```

shubham@shree:~/Desktop/DBIPProject1/db-sys-impl/project2a/a2test$ ./runTestCases.sh
whichPage 2 length 2
BAD: you tried to read past the end of the file
consumer: 25 recs out of 25 recs in sorted order
producer: 100000
consumer: recs removed written out as heap DBFile at customer.bin.big
consumer: 150000 recs out of 150000 recs in sorted order
producer: 100000
producer: 200000
producer: 300000
producer: 400000
producer: 500000
producer: 600000
producer: 700000
producer: 800000
producer: 900000
producer: 1000000
producer: 1100000
producer: 1200000
producer: 1300000
producer: 1400000
producer: 1500000
consumer: 1500000 recs out of 1500000 recs in sorted order
whichPage 2 length 2
BAD: you tried to read past the end of the file
consumer: 25 recs out of 25 recs in sorted order
shubham@shree:~/Desktop/DBIPProject1/db-sys-impl/project2a/a2test$ cat output1.txt
n_nationkey: [6], n_name: [FRANCE], n_regionkey: [3], n_comment: [refully final requests. regular, ironl]
n_nationkey: [19], n_name: [ROMANIA], n_regionkey: [3], n_comment: [ular asymptotes are about the furlous multipliers. express dependencies na
g above the ironically ironic account]
n_nationkey: [22], n_name: [RUSSIA], n_regionkey: [3], n_comment: [ requests against the platelets use never according to the quickly regular
pint]
n_nationkey: [23], n_name: [UNITED KINGDOM], n_regionkey: [3], n_comment: [eans boost carefully special requests. accounts are. carefull]
n_nationkey: [13], n_name: [JORDAN], n_regionkey: [4], n_comment: [ic deposits are blithely about the carefully regular pa]
n_nationkey: [4], n_name: [EGYPT], n_regionkey: [4], n_comment: [y above the carefully unusual theodolites. final dugouts are quickly across t
he furtiously regular d]
n_nationkey: [11], n_name: [IRAQ], n_regionkey: [4], n_comment: [nic deposits boost atop the quickly final requests? quickly regula]
n_nationkey: [20], n_name: [SAUDI ARABIA], n_regionkey: [4], n_comment: [ts. silent requests handle. closely express packages sleep across the

```

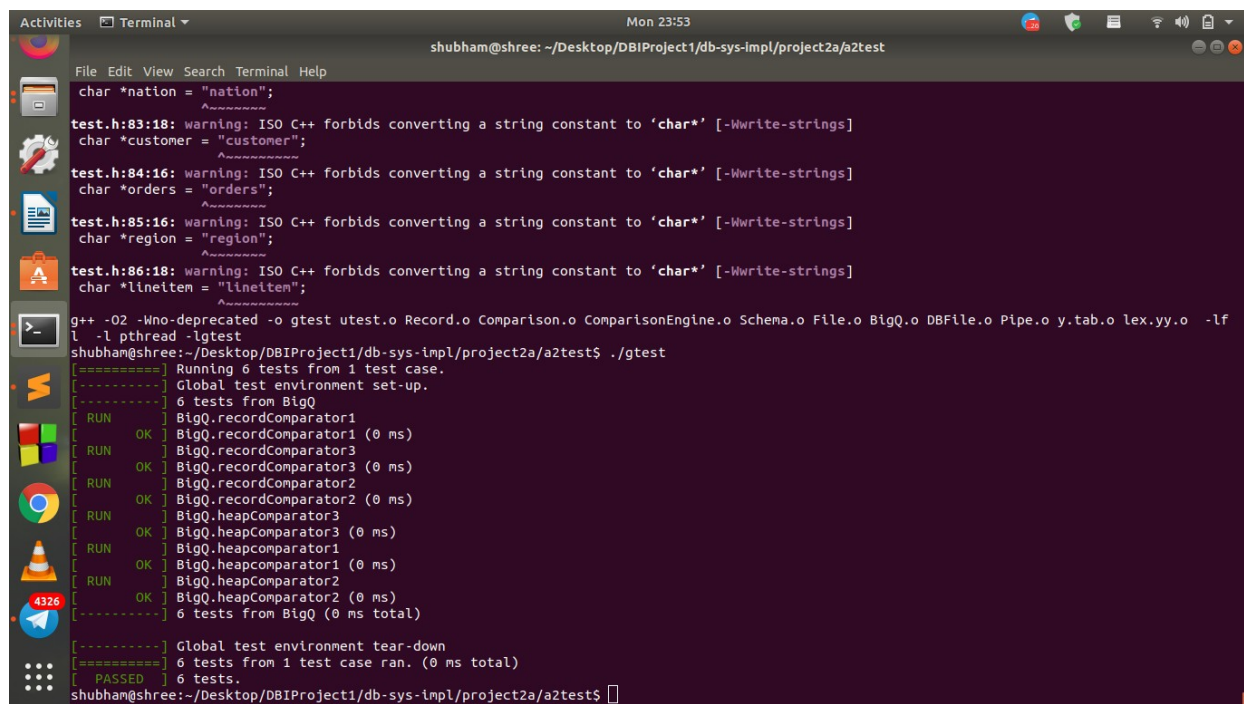
```
Activities Terminal Mon 22:54
shubham@shree: ~/Desktop/DBIProject1/db-sys-impl/project2a/a2test

File Edit View Search Terminal Help
shubham@shree:~/Desktop/DBIProject1/db-sys-impl/project2a/a2test$ cat output.txt
n_nationkey: [6], n_name: [FRANCE], n_regionkey: [3], n_comment: [refully final requests. regular, ironi]
n_nationkey: [19], n_name: [ROMANIA], n_regionkey: [3], n_comment: [ular asymptotes are about the furious multipliers. express dependencies na
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n_nationkey: [22], n_name: [RUSSIA], n_regionkey: [3], n_comment: [ requests against the platelets use never according to the quickly regular
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n_nationkey: [11], n_name: [IRAQ], n_regionkey: [4], n_comment: [nic deposits boost atop the quickly final requests? quickly regula]
n_nationkey: [20], n_name: [SAUDI ARABIA], n_regionkey: [4], n_comment: [ts. silent requests haggle. closely express packages sleep across the
blithely]
n_nationkey: [10], n_name: [IRAN], n_regionkey: [4], n_comment: [efully alongside of the slyly final dependencies. ]
consumer: removed 25 recs from the pipe
*****
producer: opened DBFile customer.bin
producer: inserted 150000 recs into the pipe
consumer: removed 150000 recs from the pipe
*****
o_orderkey: [4515876], o_custkey: [100685], o_orderstatus: [F], o_totalprice: [510062], o_orderdate: [1993-11-02], o_orderpriority: [4-NOT SPE
CIFIED], o_clerk: [Clerk#000000105], o_shippriority: [0], o_comment: [carefully accounts: slyly ironic pinto beans detect. brave somas a]
o_orderkey: [2185667], o_custkey: [51796], o_orderstatus: [F], o_totalprice: [511360], o_orderdate: [1992-10-08], o_orderpriority: [1-URGENT],
o_clerk: [Clerk#000000574], o_shippriority: [0], o_comment: [, deposits wake quickly unusual deposits. express dependencies wake. ]
o_orderkey: [2199712], o_custkey: [66790], o_orderstatus: [0], o_totalprice: [515532], o_orderdate: [1996-09-30], o_orderpriority: [2-HIGH], o
_clerk: [Clerk#000000650], o_shippriority: [0], o_comment: [ the final, ironic deposits inte]
o_orderkey: [3586919], o_custkey: [24049], o_orderstatus: [F], o_totalprice: [522644], o_orderdate: [1992-11-07], o_orderpriority: [1-URGENT],
o_clerk: [Clerk#000000924], o_shippriority: [0], o_comment: [are alongside of the pending deposits. quick]
o_orderkey: [2232932], o_custkey: [13940], o_orderstatus: [0], o_totalprice: [522721], o_orderdate: [1997-04-13], o_orderpriority: [2-HIGH], o
_clerk: [Clerk#000000245], o_shippriority: [0], o_comment: [lithely stealthy accounts are slyly against the pend]
o_orderkey: [4576548], o_custkey: [108931], o_orderstatus: [0], o_totalprice: [525591], o_orderdate: [1997-12-26], o_orderpriority: [1-URGENT]
, o_clerk: [Clerk#000000336], o_shippriority: [0], o_comment: [he slyly ironic requests. regular, bold deposits cajol]
o_orderkey: [3043270], o_custkey: [144617], o_orderstatus: [0], o_totalprice: [530604], o_orderdate: [1997-02-12], o_orderpriority: [5-LOW], o
_clerk: [Clerk#000000699], o_shippriority: [0], o_comment: [riously final deposits? ]
o_orderkey: [4722021], o_custkey: [128120], o_orderstatus: [F], o_totalprice: [544089], o_orderdate: [1994-04-07], o_orderpriority: [1-URGENT]
, o_clerk: [Clerk#000000230], o_shippriority: [0], o_comment: [al, express pinto beans are after the careful]
o_orderkey: [1750466], o_custkey: [21433], o_orderstatus: [F], o_totalprice: [555285], o_orderdate: [1992-11-30], o_orderpriority: [4-NOT SPEC
IFIED], o_clerk: [Clerk#00000040], o_shippriority: [0], o_comment: [ ironic packages. even notornis integrate. fluffily regular foxes snooze
furi]
consumer: removed 150000 recs from the pipe
*****
n_nationkey: [7], n_name: [GERMANY], n_regionkey: [3], n_comment: [l platelets. regular accounts x-ray: unusual, regular acco]
n_nationkey: [19], n_name: [ROMANIA], n_regionkey: [3], n_comment: [ular asymptotes are about the furious multipliers. express dependencies na
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n_nationkey: [22], n_name: [RUSSIA], n_regionkey: [3], n_comment: [ requests against the platelets use never according to the quickly regular
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n_nationkey: [23], n_name: [UNITED KINGDOM], n_regionkey: [3], n_comment: [eans boost carefully special requests. accounts are. carefull]
n_nationkey: [10], n_name: [IRAN], n_regionkey: [4], n_comment: [efully alongside of the slyly final dependencies. ]
n_nationkey: [11], n_name: [IRAQ], n_regionkey: [4], n_comment: [nic deposits boost atop the quickly final requests? quickly regula]
n_nationkey: [13], n_name: [JORDAN], n_regionkey: [4], n_comment: [ic deposits are blithely about the carefully regular pa]
n_nationkey: [20], n_name: [SAUDI ARABIA], n_regionkey: [4], n_comment: [ts. silent requests haggle. closely express packages sleep across the
blithely]
consumer: removed 25 recs from the pipe
shubham@shree:~/Desktop/DBIProject1/db-sys-impl/project2a/a2test$
```

```
Activities Terminal Mon 22:54
shubham@shree: ~/Desktop/DBIProject1/db-sys-impl/project2a/a2test

File Edit View Search Terminal Help
*****
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n_nationkey: [23], n_name: [UNITED KINGDOM], n_regionkey: [3], n_comment: [eans boost carefully special requests. accounts are. carefull]
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blithely]
consumer: removed 25 recs from the pipe
shubham@shree:~/Desktop/DBIProject1/db-sys-impl/project2a/a2test$
```

Screenshot of gTests:



```
Activities Terminal Mon 23:53
shubham@shree: ~/Desktop/DBIPProject1/db-sys-impl/project2a/a2test

File Edit View Search Terminal Help
char *nation = "nation";
test.h:83:18: warning: ISO C++ forbids converting a string constant to 'char*' [-Wwrite-strings]
char *customer = "customer";
test.h:84:16: warning: ISO C++ forbids converting a string constant to 'char*' [-Wwrite-strings]
char *orders = "orders";
test.h:85:16: warning: ISO C++ forbids converting a string constant to 'char*' [-Wwrite-strings]
char *region = "region";
test.h:86:18: warning: ISO C++ forbids converting a string constant to 'char*' [-Wwrite-strings]
char *lineltem = "lineltem";

g++ -O2 -Wno-deprecated -o gtest utest.o Record.o Comparison.o ComparisonEngine.o Schema.o File.o BigQ.o DBFile.o Pipe.o y.tab.o lex.yy.o -lpthread -lgtest
shubham@shree:~/Desktop/DBIPProject1/db-sys-impl/project2a/a2test$ ./gtest
[=====] Running 6 tests from 1 test case.
[-----] Global test environment set-up.
[-----] 6 tests from BigQ
[ RUN ] BigQ.recordComparator1
[ OK ] BigQ.recordComparator1 (0 ms)
[ RUN ] BigQ.recordComparator3
[ OK ] BigQ.recordComparator3 (0 ms)
[ RUN ] BigQ.recordComparator2
[ OK ] BigQ.recordComparator2 (0 ms)
[ RUN ] BigQ.heapComparator3
[ OK ] BigQ.heapComparator3 (0 ms)
[ RUN ] BigQ.heapComparator1
[ OK ] BigQ.heapComparator1 (0 ms)
[ RUN ] BigQ.heapComparator2
[ OK ] BigQ.heapComparator2 (0 ms)
[-----] 6 tests from BigQ (0 ms total)

[-----] Global test environment tear-down
[=====] 6 tests from 1 test case ran. (0 ms total)
[ PASSED ] 6 tests.
shubham@shree:~/Desktop/DBIPProject1/db-sys-impl/project2a/a2test$
```