# COP6726 DATABASE SYSTEM IMPLEMENTATION PROJECT 2 MILESTONE I REPORT

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## To run the code:
- Compile the test.cc using the command make test.cc and then run it using ./test.out. We will get a menu of three options:
  a)Sort: which sorts the records and dumps them to the output pipe.
  b)Sort+display:Sorts, dumps and then it displays the results.
  c)sort+write: Sort, dumps to the output file and writes in a ".bigq" file
- Compile the gTest.cc using the command make gTest.out and run it using ./gTest.out. It runs the following testcases for createTest, closeTest, openTest and passes all the test cases successfully.
- Compile the shell script which consists of four test cases using sh runTestCases.sh. Run them using ./runTestCases.sh

## Output.txt:
Output file is generated after execution:
n_nationkey: [7], n_name: [GERMANY], n_regionkey: [3], n_comment: [l platelets. regular accounts x-ray: unusual, regular acco]
n_nationkey: [6], n_name: [FRANCE], n_regionkey: [3], n_comment: [refully final requests. regular, ironi]
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: [11], n_name: [IRAQ], n_regionkey: [4], n_comment: [nic deposits boost atop the quickly final requests? quickly regula]
n_nationkey: [10], n_name: [IRAN], n_regionkey: [4], n_comment: [efully alongside of the slyly final dependencies. ]
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]
n_nationkey: [4], n_name: [EGYPT], n_regionkey: [4], n_comment: [y above the carefully unusual theodolites. final dugouts are quickly across the furiously regular d]
 consumer: removed 25 recs from the pipe

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********************************************************************
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 producer: opened DBFile customer.bin
 producer: inserted 1500 recs into the pipe
 consumer: removed 1500 recs from the pipe
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o_orderkey: [39620], o_custkey: [1279], o_orderstatus: [F], o_totalprice: [406938],
o_orderdate: [1994-10-05], o_orderpriority: [2-HIGH], o_clerk: [Clerk#000000457],
o_shippriority: [0], o_comment: [nic packages sleep quickly regular excuses. busy packages
nag finally! package]
o_orderkey: [17571], o_custkey: [358], o_orderstatus: [F], o_totalprice: [408346],
o_orderdate: [1992-03-16], o_orderpriority: [4-NOT SPECIFIED], o_clerk:
[Clerk#000000503], o_shippriority: [0], o_comment: [ckages. blithely silent requests use
quickly final packages. somas mainta]
o_orderkey: [39456], o_custkey: [1016], o_orderstatus: [O], o_totalprice: [409771],
o_orderdate: [1998-02-16], o_orderpriority: [2-HIGH], o_clerk: [Clerk#000000972],
o_shippriority: [0], o_comment: [ts sleep final requests. carefully b]
o_orderkey: [57376], o_custkey: [676], o_orderstatus: [O], o_totalprice: [411255],
o_orderdate: [1995-06-20], o_orderpriority: [1-URGENT], o_clerk: [Clerk#000000618],
o_shippriority: [0], o_comment: [ular Tiresias after the furiously regular requests sha]
o_orderkey: [6882], o_custkey: [178], o_orderstatus: [O], o_totalprice: [422360],
o_orderdate: [1997-04-09], o_orderpriority: [1-URGENT], o_clerk: [Clerk#000000974],
o_shippriority: [0], o_comment: [y dolphins. furiously ironic asymptotes s]
o_orderkey: [59106], o_custkey: [953], o_orderstatus: [O], o_totalprice: [430620],
o_orderdate: [1996-10-24], o_orderpriority: [4-NOT SPECIFIED], o_clerk:
[Clerk#000000344], o_shippriority: [0], o_comment: [y above the slyly final deposits.
furiously regular pinto beans use s]
o_orderkey: [44707], o_custkey: [1013], o_orderstatus: [O], o_totalprice: [431772],
o_orderdate: [1997-08-14], o_orderpriority: [1-URGENT], o_clerk: [Clerk#000000313],
o_shippriority: [0], o_comment: [ly fluffily special ideas.]
o_orderkey: [29158], o_custkey: [667], o_orderstatus: [O], o_totalprice: [439687],
o_orderdate: [1995-10-21], o_orderpriority: [2-HIGH], o_clerk: [Clerk#000000525],
o_shippriority: [0], o_comment: [lessly quiet deposits across the furiously ironi]
o_orderkey: [52965], o_custkey: [676], o_orderstatus: [O], o_totalprice: [466001],
o_orderdate: [1996-09-22], o_orderpriority: [3-MEDIUM], o_clerk: [Clerk#000000103],
o_shippriority: [0], o_comment: [thless pinto beans use about the blithe]
 consumer: removed 15000 recs from the pipe
********************************************************************
********************************************************************
******************************
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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 nag 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: [4], n_name: [EGYPT], n_regionkey: [4], n_comment: [y above the carefully unusual theodolites. final dugouts are quickly across the furiously regular d]

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


# OUTPUTS OF THE TESTCASES:

**TEST CASE1:**

**Input:**

2

1

16

(n_regionkey)

**Output:**

```
nikhil@DESKTOP-G3LL7I1:/mnt/c/Users/Dhanjay/Desktop/a2-2test$ ./test.out

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


select test option:
        1. sort
        2. sort + display
        3. sort + write
        2

select dbfile to use:
        1. nation
        2. region
        3. customer
        4. part
        5. partsupp
        6. orders
        7. lineitem
        1

specify runlength:
        16

specify sort ordering (when done press ctrl-D):
        (n_regionkey)

producer: opened DBFile nation.bin
producer: inserted 25 recs into the pipe
n_nationkey: [0], n_name: [ALGERIA], n_regionkey: [0], n_comment: [ haggle. carefully final deposits detect slyly agai]
n_nationkey: [5], n_name: [ETHIOPIA], n_regionkey: [0], n_comment: [ven packages wake quickly. regu]
n_nationkey: [14], n_name: [KENYA], n_regionkey: [0], n_comment: [ pending excuses haggle furiously deposits. pending, express pinto beans wake fluffily past t]
n_nationkey: [15], n_name: [MOROCCO], n_regionkey: [0], n_comment: [rns. blithely bold courts among the closely regular packages use furiously bold platelets?]
n_nationkey: [16], n_name: [MOZAMBIQUE], n_regionkey: [0], n_comment: [s. ironic, unusual asymptotes wake blithely r]
n_nationkey: [1], n_name: [ARGENTINA], n_regionkey: [1], n_comment: [al foxes promise slyly according to the regular accounts. bold requests alon]
n_nationkey: [2], n_name: [BRAZIL], n_regionkey: [1], n_comment: [y alongside of the pending deposits. carefully special packages are about the ironic forges. slyly special ]
n_nationkey: [3], n_name: [CANADA], n_regionkey: [1], n_comment: [eas hang ironic, silent packages. slyly regular packages are furiously over the tithes. fluffily bold]
n_nationkey: [17], n_name: [PERU], n_regionkey: [1], n_comment: [platelets. blithely pending dependencies use fluffily across the even pinto beans. carefully silent accoun]
n_nationkey: [24], n_name: [UNITED STATES], n_regionkey: [1], n_comment: [y final packages. slow foxes cajole quickly. quickly silent platelets breach ironic accounts. unusual pinto be]
n_nationkey: [21], n_name: [VIETNAM], n_regionkey: [2], n_comment: [hely enticingly express accounts. even, final ]
n_nationkey: [9], n_name: [INDONESIA], n_regionkey: [2], n_comment: [ slyly express asymptotes. regular deposits haggle slyly. carefully ironic hockey players sleep blithely. carefull]
n_nationkey: [12], n_name: [JAPAN], n_regionkey: [2], n_comment: [ously. final, express gifts cajole a]
n_nationkey: [18], n_name: [CHINA], n_regionkey: [2], n_comment: [c dependencies. furiously express notornis sleep slyly regular accounts. ideas sleep. depos]
n_nationkey: [8], n_name: [INDIA], n_regionkey: [2], n_comment: [ss excuses cajole slyly across the packages. deposits print aroun]
n_nationkey: [19], n_name: [ROMANIA], n_regionkey: [3], n_comment: [ular asymptotes are about the furious multipliers. express dependencies nag above the ironically ironic account]
n_nationkey: [7], n_name: [GERMANY], n_regionkey: [3], n_comment: [l platelets. regular accounts x-ray: unusual, regular acco]
n_nationkey: [6], n_name: [FRANCE], n_regionkey: [3], n_comment: [refully final requests. regular, ironi]
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: [11], n_name: [IRAQ], n_regionkey: [4], n_comment: [nic deposits boost atop the quickly final requests? quickly regula]
n_nationkey: [10], n_name: [IRAN], n_regionkey: [4], n_comment: [efully alongside of the slyly final dependencies. ]
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]
n_nationkey: [4], n_name: [EGYPT], n_regionkey: [4], n_comment: [y above the carefully unusual theodolites. final dugouts are quickly across the furiously regular d]
consumer: removed 25 recs from the pipe
consumer: 25 recs out of 25 recs in sorted order
```

**TEST CASE 2:**
**Input:**3
3
16
(c_phone) AND (c_custkey)

**Output:**

```
nikhil@DESKTOP-G3LL7I1:/mnt/c/Users/Dhanjay/Desktop/a2-2test$ ./test.out

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


 select test option:
         1. sort
         2. sort + display
         3. sort + write
         3

 select dbfile to use:
         1. nation
         2. region
         3. customer
         4. part
         5. partsupp
         6. orders
         7. lineitem
         3

 specify runlength:
         16

 specify sort ordering (when done press ctrl-D):
         (c_phone) AND (c_custkey)

 producer: opened DBFile customer.bin
 producer: inserted 1500 recs into the pipe
 consumer: removed 1500 recs from the pipe
 consumer: recs removed written out as heap DBFile at customer.bin.bigq
 consumer: 1500 recs out of 1500 recs in sorted order
```

**TEST CASE 3:**
**Input:**
2
6

128
(o_totalprice) AND (o_custkey)
**Output:**





**TEST CASE 4:**
**Input:**
2

1
8
(n_regionkey) AND (n_name)

**Output:**



**SHELL SCRIPT:**



**GTEST:**

```
nikhil@DESKTOP-G3LL7I1:/mnt/c/Users/Dhanjay/Desktop/a2-2test$ ./gTest.out
[==========] Running 3 tests from 1 test suite.
[----------] Global test environment set-up.
[----------] 3 tests from DBFileTest
[ RUN      ] DBFileTest.CreateTest
[       OK ] DBFileTest.CreateTest (68 ms)
[ RUN      ] DBFileTest.CloseTest
[       OK ] DBFileTest.CloseTest (85 ms)
[ RUN      ] DBFileTest.OpenTest
[       OK ] DBFileTest.OpenTest (68 ms)
[----------] 3 tests from DBFileTest (221 ms total)

[----------] Global test environment tear-down
[==========] 3 tests from 1 test suite ran. (221 ms total)
[  PASSED  ] 3 tests.
nikhil@DESKTOP-G3LL7I1:/mnt/c/Users/Dhanjay/Desktop/a2-2test$
```

## CONCLUSION

We have created a bigq file and inserted the records into the pipe, sorted them and stored in
.bigq files. We used pthreads to achieve multithreading and performed all the required
testcases to determine the performance. In the next milestone we can implement the sorted
file system.