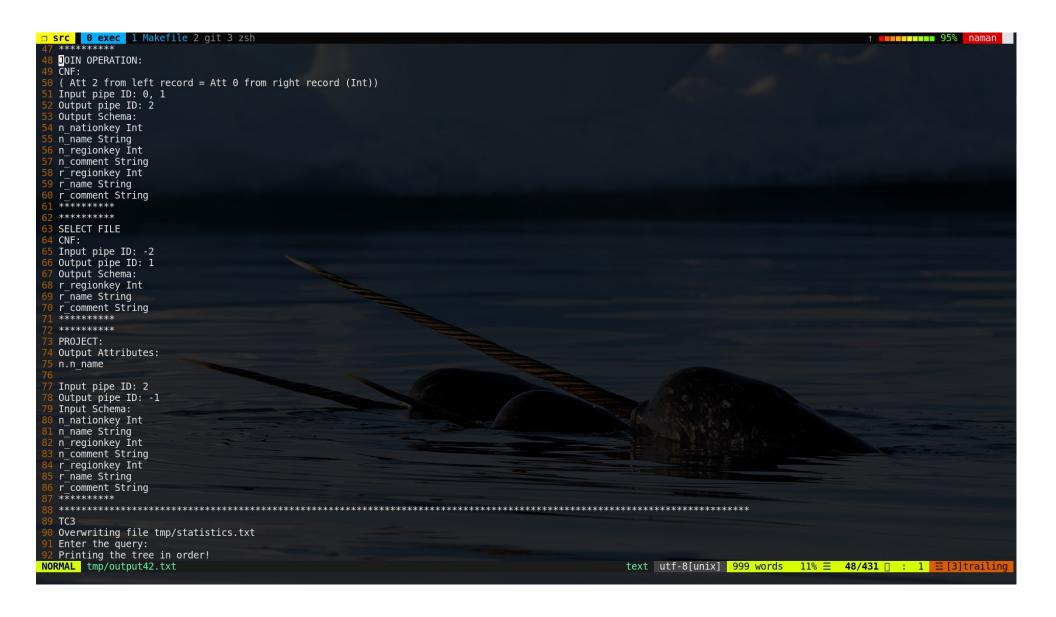
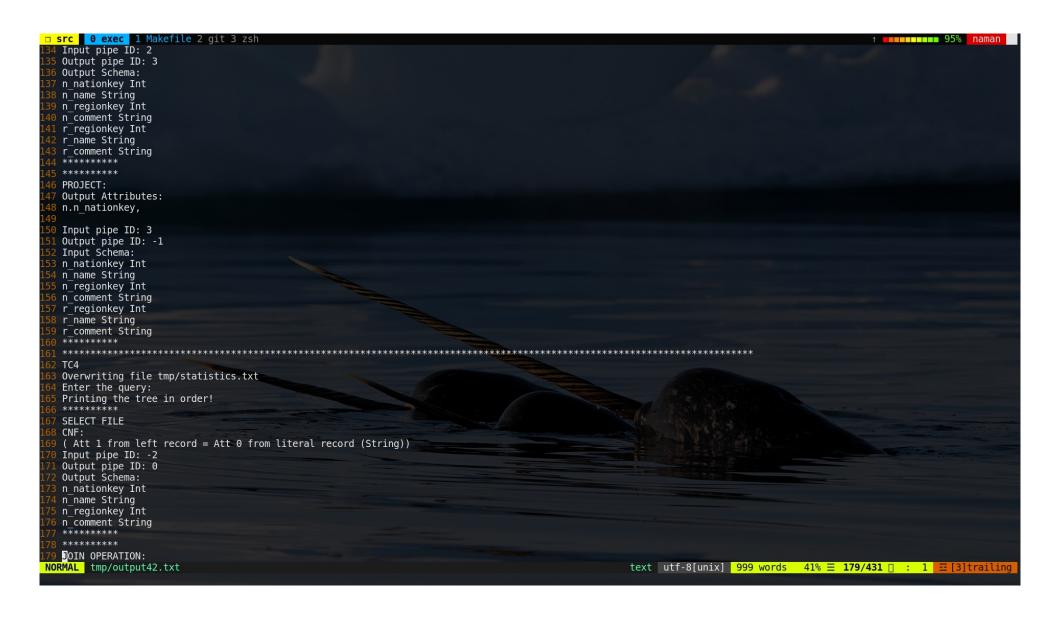
Outputs:

```
□ src 0 exec 1 Makefile 2 git 3 zsh
                                                                                                                             1 95% naman
   C1
   Overwriting file tmp/statistics.txt
   Enter the query:
   Printing the tree in order!
   *******
   SELECT FILE
   ( Att 1 from left record = Att 0 from literal record (String))
   Input pipe ID: -2
   Output pipe ID: 0
   Output Schema:
   n nationkey Int
  n name String
 4 n regionkey Int
 .5 n_comment String
.6 ********
   PROJECT:
   Output Attributes:
   n.n nationkey
   Input pipe ID: 0
   Output pipe ID: -1
   Input Schema:
   n nationkey Int
   n name String
   n regionkey Int
   n comment String
   ********
   Overwriting file tmp/statistics.txt
   Enter the query:
   Printing the tree in order!
   ******
   SELECT FILE
   ( Att 0 from left record > Att 0 from literal record (Int))
   Input pipe ID: -2
   Output pipe ID: 0
   Output Schema:
   n nationkey Int
   n name String
  n regionkey Int
   n comment String
  *******
NORMAL tmp/output42.txt
                                                                                         text utf-8[unix] 999 words 0% ≡ 1/431 [ : 1 ≡
"tmp/output42.txt" 431L, 7451C
```



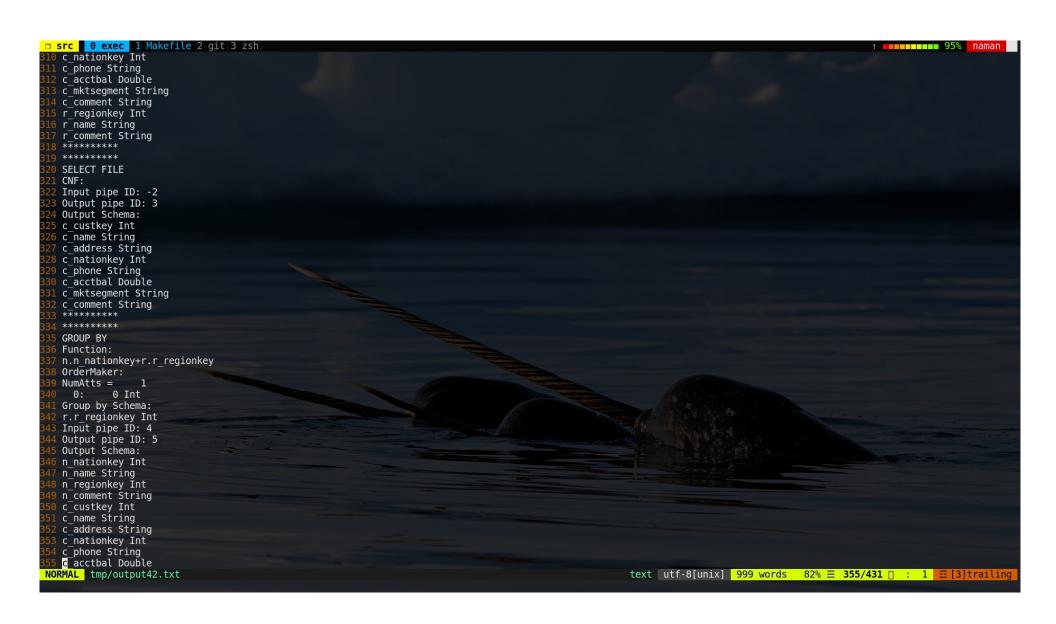
```
□ src 0 exec 1 Makefile 2 git 3 zsh
                                                                                                                                                  ↑ •••••••••• 95% naman
   Overwriting file tmp/statistics.txt
   Enter the query:
   Printing the tree in order!
   ******
   SELECT FILE
   CNF:
   ( Att 1 from left record = Att 0 from literal record (String))
   Input pipe ID: -2
   Output pipe ID: 0
Output Schema:
  n_nationkey Int
   n name String
   n_regionkey Int
   n_comment String
*********
   JOIN OPERATION:
   CNF:
   ( Att 2 from left record = Att 0 from right record (Int))
   Input pipe ID: 0, 1
   Output pipe ID: 2
   Output Schema:
   n nationkey Int
   n name String
   n regionkey Int
   n_comment String
   r_regionkey Int
   r name String
   r comment String
   *******
   SELECT FILE
   CNF:
   Input pipe ID: -2
   Output pipe ID: 1
   Output Schema:
   r regionkey Int
   r name String
   r comment String
   ********
   ******
   SUM
   Function:
   n.n nationkey
   Input pipe ID: 2
   Qutput pipe ID: 3
NORMAL tmp/output42.txt
                                                                                                       text utf-8[unix] 999 words 31% ≡ 135/431 [ : 1 ≡ [3]trailing
```

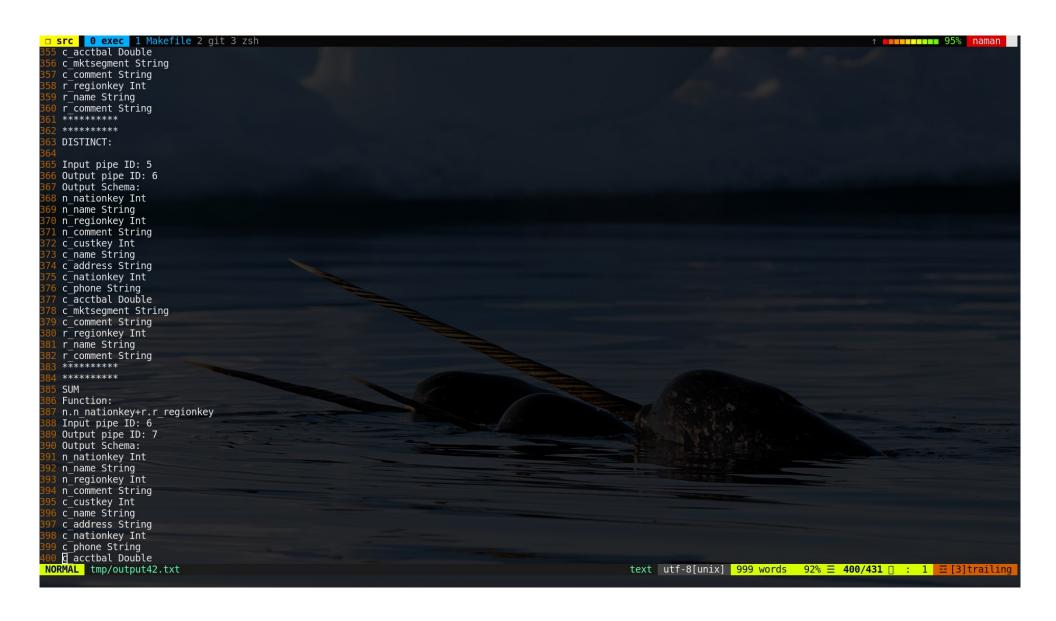


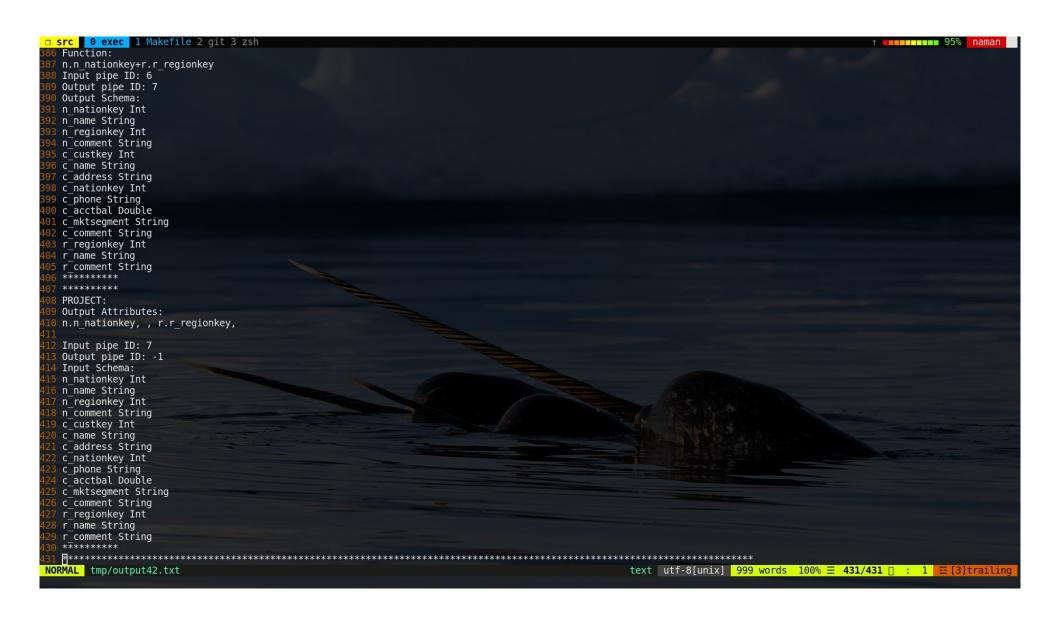
```
1 95% naman
   JOIN OPERATION:
   CNF:
   ( Att 2 from left record = Att 0 from right record (Int))
   Input pipe ID: 0, 1
   Output pipe ID: 2
Output Schema:
   n nationkey Int
   n_name String
   n_regionkey Int
   n_comment String
  r_regionkey Int
  r name String
 1 r_comment String
   SELECT FILE
   CNF:
   Input pipe ID: -2
   Output pipe ID: 1
Output Schema:
   r_regionkey Int
   r name String
   r_comment String
   GROUP BY
   Function:
   n.n regionkey
   OrderMaker:
   NumAtts =
           0 Int
   Group by Schema:
   n.n regionkey Int
   Input pipe ID: 2
   Output pipe ID: 3
Output Schema:
   n_nationkey Int
   n_name String
   n regionkey Int
   n comment String
   r_regionkey Int
   r name String
   r comment String
   ********
   *******
                                                                                                   text utf-8[unix] 999 words 51% ≡ 223/431 [ : 1 ≡ [3]trai
NORMAL tmp/output42.txt
```

```
↑ ••••••••••• 95% <u>naman</u>
□ src 0 exec 1 Makefile 2 git 3 zsh
  r_comment String
  ******
  SUM
  Function:
  n.n regionkey
  Input pipe ID: 3
Output pipe ID: 4
  Output Schema:
  n_nationkey Int
  n_name String
  n regionkey Int
  n comment String
 4 r_regionkey Int
  r name String
 6 r_comment String
7 *********
  ******
  PROJECT:
  Output Attributes:
  n.n regionkey,
   Input pipe ID: 4
  Output pipe ID: -1
  Input Schema:
  n nationkey Int
  n name String
  n_regionkey Int
  n comment String
  r_regionkey Int
  r_name String
  r comment String
  Overwriting file tmp/statistics.txt
  Enter the query:
  Printing the tree in order!
  ******
  SELECT FILE
   ( Att 0 from left record > Att 0 from literal record (Int))
  Input pipe ID: -2
  Output pipe ID: 0
  Output Schema:
  n nationkey Int
                                                                                             text utf-8[unix] 999 words 61\% \equiv 266/431 \, \square : 1 \equiv [3] train
NORMAL tmp/output42.txt
```

```
□ src 0 exec 1 Makefile 2 git 3 zsh
                                                                                                                                                    1 95% naman
 6 n_nationkey Int
   n_name String
   n regionkey Int
   n comment String
   ********
   JOIN OPERATION:
   ( Att 2 from left record = Att 0 from right record (Int))
   Input pipe ID: 0, 1
   Output pipe ID: 2
   Output Schema:
   n nationkey Int
   n name String
  n regionkey Int
 1 n comment String
  2 r_regionkey Int
  3 r name String
  4 r comment String
   ********
   ******
   SELECT FILE
   CNF:
   Input pipe ID: -2
   Output pipe ID: 1
Output Schema:
   r regionkey Int
   r name String
   r comment String
   *******
   JOIN OPERATION:
   ( Att 0 from left record = Att 3 from right record (Int))
   Input pipe ID: 2, 3
   Output pipe ID: 4
Output Schema:
   n nationkey Int
   n_name String
   n regionkey Int
   n comment String
   c_custkey Int
   c name String
   c address String
   c nationkey Int
  1 c phone String
NORMAL tmp/output42.txt
                                                                                                         text utf-8[unix] 999 words 72\% \equiv 311/431 \square : 1 \equiv [3]trai
```







GTest

```
□ src 0 exec 1 Makefile 2 git 3 zsh
                                                                                                                                           1 96% naman
[naman@Oxblad3]-(~/git/database-from-scratch/src/submit)-[git://proj4 2 x]-
l<sub>></sub> ls
bigq.cc
                    comparison.h function.cc lexer func.l parse tree.h
                                                                              record.cc
                                                                                           runTestCases42.sh stat helper.cc tournament.cc
bigq.h
                                 function.h
                                              lexer.l
                                                                                                                            tournament.h
                    dbfile.cc
                                                            pipe.cc
                                                                              record.h
                                                                                           schema.cc
                                                                                                             statistics.cc
catalog
                    dbfile.h
                                              Makefile
                                                            pipe.h
                                                                                           schema.h
                                                                                                             statistics.h
                                                                                                                            tpch-dbgen
                                 gtest.cc
                                                                              run gen.cc
                                                                                                                            two_way_list.cc
two_way_list.h
comparison.cc
                    defs.h
                                                            qp tree.cc
                                                                              run gen.h
                                                                                           sorted.cc
                                  gtest.out
                                              parse func.h
                                                                                                             test.cc
comparison engine.cc file.cc
                                  heap.cc
                                              parser func.y qp tree.h
                                                                              run merge.cc sorted.h
                                                                                                             test.h
comparison engine.h file.h
                                                            qp tree helper.cc run merge.h sort helper.cc
                                 heap.h
                                              parser.y
 [naman⊕0xblad3]-(~/git/database-from-scratch/src/submit)-[git://proj4 2 x]-
 > ./gtest.out
 =======] Running 2 tests from 1 test case.
            Global test environment set-up.
           2 tests from QTREETEST
 RUN
           QTREETEST.pipecount
File [
            OK ] QTREETEST.pipecount (0 ms)
 RUN
            QTREETEST.selops
       OK ] QTREETEST.selops (0 ms)
  -----] 2 tests from QTREETEST (0 ms total)
 =======] 2 tests from 1 test case ran. (0 ms total)
  PASSED ] 2 tests.
  naman@0xblad3]-(~/git/database-from-scratch/src/submit)-[git://proj4 2 x]-
```