

```
In [3]: 1 import glob
```

```
In [30]: 1 import traceback  
2 import datetime
```

```
In [2]: 1 # presto-test.py  
2 # simple python script to run a query on a presto cluster and display the result set  
3 from sqlalchemy import *  
4 from sqlalchemy.engine import create_engine  
5 from sqlalchemy.schema import *  
6 engine = create_engine("presto://localhost:8080/ahana_hive", connect_args={'protocol': 'http'})  
7  
8 with engine.connect() as con:  
9     rs = con.execute('SELECT now()')  
10     for row in rs:  
11         print(row)
```

```
('2021-10-21 02:18:16.614 UTC',)
```

```
In [1]: 1 !pwd
```

```
/home/wengong/projects/py4kids/lesson-14-db/presto
```

```
In [4]: 1 sql_files = glob.glob("./benchmark/tpcds/*.sql")
```

```
In [5]: 1 len(sql_files)
```

```
Out[5]: 103
```

```
In [7]: 1 sorted(sql_files)
```

```
Out[7]: ['./benchmark/tpcds/q01.sql',  
          './benchmark/tpcds/q02.sql',  
          './benchmark/tpcds/q03.sql',  
          './benchmark/tpcds/q04.sql',  
          './benchmark/tpcds/q05.sql',  
          './benchmark/tpcds/q06.sql',  
          './benchmark/tpcds/q07.sql',  
          './benchmark/tpcds/q08.sql',  
          './benchmark/tpcds/q09.sql',  
          './benchmark/tpcds/q10.sql',  
          './benchmark/tpcds/q11.sql',  
          './benchmark/tpcds/q12.sql',  
          './benchmark/tpcds/q13.sql',  
          './benchmark/tpcds/q14_1.sql',  
          './benchmark/tpcds/q14_2.sql',  
          './benchmark/tpcds/q15.sql',  
          './benchmark/tpcds/q16.sql',  
          './benchmark/tpcds/q17.sql',  
          './benchmark/tpcds/q18.sql',  
          './benchmark/tpcds/q19.sql']
```

```
In [ ]: 1
```

```
In [18]: 1 database,schema,table = "tpcds.tiny.customer".split(".")
```

```
In [19]: 1 database,schema,table
```

```
Out[19]: ('tpcds', 'tiny', 'customer')
```

```
In [20]: 1 sql = f"""  
2 describe {database}.{schema}.{table}  
3 """  
4  
5 columns = []  
6 with engine.connect() as con:  
7     rs = con.execute(sql)  
8     for row in rs:  
9         columns.append(row)
```

```
In [21]: 1 len(columns), columns
```

```
Out[21]: (18,  
[('c_customer_sk', 'bigint', '', ''),  
 ('c_customer_id', 'char(16)', '', ''),  
 ('c_current_demo_sk', 'bigint', '', ''),  
 ('c_current_hdemo_sk', 'bigint', '', ''),  
 ('c_current_addr_sk', 'bigint', '', ''),  
 ('c_first_ship_to_date_sk', 'bigint', '', ''),  
 ('c_first_sales_date_sk', 'bigint', '', ''),  
 ('c_salutation', 'char(10)', '', ''),  
 ('c_first_name', 'char(20)', '', ''),  
 ('c_last_name', 'char(30)', '', ''),  
 ('c_preferred_cust_flag', 'char(1)', '', ''),  
 ('c_birth_day', 'integer', '', ''),  
 ('c_birth_month', 'integer', '', ''),  
 ('c_birth_year', 'integer', '', ''),  
 ('c_birth_country', 'varchar(20)', '', ''),  
 ('c_login', 'char(13)', '', ''),  
 ('c_email_address', 'char(50)', '', ''),  
 ('c_last_review_date_sk', 'bigint', '', '')])
```

```
In [15]: 1 sql = f"""  
2 select * from {catalog}.{schema}.{table} limit 10  
3 """  
4  
5 results = []  
6 with engine.connect() as con:  
7     rs = con.execute(sql)  
8     for row in rs:  
9         results.append(row)
```

```
In [16]: 1 len(results)
```

```
Out[16]: 10
```

```
In [22]: 1 len(results[0])
```

```
Out[22]: 18
```

```
In [24]: 1 sql = "select * from ${database}.${schema}.customer limit 2"
```

```
In [25]: 1 sql.replace("$", "").format(database=database, schema=schema)
```

```
Out[25]: 'select * from tpcds.tiny.customer limit 2'
```

```
In [31]: 1 conn = engine.connect()
```

```

In [35]: 1 i = 0
2 for file_sql in sorted(sql_files):
3     # if i > 1: break
4
5     print(f"\n\nSQL name: {file_sql}...\n=====")
6     sql = open(file_sql).read().replace("$", "").format(database=database, schema=schema)
7     print(sql)
8     print("\n")
9
10    results = []
11    start = datetime.datetime.now()
12    try:
13        rs = conn.execute(sql)
14        stop = datetime.datetime.now()
15        for row in rs:
16            results.append(row)
17
18        print(f"Results: completed in {(stop - start).seconds} sec\n+++++")
19    except Exception:
20        print(traceback.format_exc())
21
22    i += 1
23

```

SQL name: ./benchmark/tpcds/q01.sql...

=====

WITH

```

    customer_total_return AS (
        SELECT
            "sr_customer_sk" "ctr_customer_sk"
            , "sr_store_sk" "ctr_store_sk"
            , "sum"("sr_return_amt") "ctr_total_return"
        FROM
            tpcds.tiny.store_returns
            , tpcds.tiny.date_dim
        WHERE ("sr_returned_date_sk" = "d_date_sk")
            AND ("d_year" = 2000)
        GROUP BY "sr_customer_sk", "sr_store_sk"
    )
SELECT "c_customer_id"

```

```

FROM
    customer_total_return ctr1
, tpcds.tiny.store
, tpcds.tiny.customer
WHERE ("ctr1"."ctr_total_return" > (
    SELECT ("avg"("ctr_total_return") * DECIMAL '1.2')
    FROM
        customer_total_return ctr2
    WHERE ("ctr1"."ctr_store_sk" = "ctr2"."ctr_store_sk")
))
AND ("s_store_sk" = "ctr1"."ctr_store_sk")
AND ("s_state" = 'TN')
AND ("ctr1"."ctr_customer_sk" = "c_customer_sk")
ORDER BY "c_customer_id" ASC
LIMIT 100

```

Results: completed in 1 sec

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```

[('AAAAAAAAAACAAAA',), ('AAAAAAAAAADAAAA',), ('AAAAAAAAACAAAA',), ('AAAAAAAAADDAAAA',), ('AAAA
AAAAEAAAA',)]

```

SQL name: ./benchmark/tpcds/q02.sql...

=====

```

WITH
    wscs AS (
        SELECT
            "sold_date_sk"
        , "sales_price"
        FROM
            (
                SELECT
                    "ws_sold_date_sk" "sold_date_sk"
                , "ws_ext_sales_price" "sales_price"
                FROM
                    tpcds.tiny.web_sales
            )
    )
UNION ALL (
    SELECT
        "cs_sold_date_sk" "sold_date_sk"
    , "cs_ext_sales_price" "sales_price"

```

```

        FROM
            tpcds.tiny.catalog_sales
    ) )
, wswscs AS (
    SELECT
        "d_week_seq"
        , "sum"((CASE WHEN ("d_day_name" = 'Sunday') THEN "sales_price" ELSE null END)) "sun_sales"
        , "sum"((CASE WHEN ("d_day_name" = 'Monday') THEN "sales_price" ELSE null END)) "mon_sales"
        , "sum"((CASE WHEN ("d_day_name" = 'Tuesday') THEN "sales_price" ELSE null END)) "tue_sales"
        , "sum"((CASE WHEN ("d_day_name" = 'Wednesday') THEN "sales_price" ELSE null END)) "wed_sales"
        , "sum"((CASE WHEN ("d_day_name" = 'Thursday') THEN "sales_price" ELSE null END)) "thu_sales"
        , "sum"((CASE WHEN ("d_day_name" = 'Friday') THEN "sales_price" ELSE null END)) "fri_sales"
        , "sum"((CASE WHEN ("d_day_name" = 'Saturday') THEN "sales_price" ELSE null END)) "sat_sales"
    FROM
        wscs
        , tpcds.tiny.date_dim
    WHERE ("d_date_sk" = "sold_date_sk")
    GROUP BY "d_week_seq"
)
SELECT
    "d_week_seq1"
    , "round"(("sun_sales1" / "sun_sales2"), 2)
    , "round"(("mon_sales1" / "mon_sales2"), 2)
    , "round"(("tue_sales1" / "tue_sales2"), 2)
    , "round"(("wed_sales1" / "wed_sales2"), 2)
    , "round"(("thu_sales1" / "thu_sales2"), 2)
    , "round"(("fri_sales1" / "fri_sales2"), 2)
    , "round"(("sat_sales1" / "sat_sales2"), 2)
FROM
    (
        SELECT
            "wswscs"."d_week_seq" "d_week_seq1"
            , "sun_sales" "sun_sales1"
            , "mon_sales" "mon_sales1"
            , "tue_sales" "tue_sales1"
            , "wed_sales" "wed_sales1"
            , "thu_sales" "thu_sales1"
            , "fri_sales" "fri_sales1"
            , "sat_sales" "sat_sales1"
        FROM
            wswscs
            , tpcds.tiny.date_dim
        WHERE ("date_dim"."d_week_seq" = "wswscs"."d_week_seq")
    )

```

```

        AND ("d_year" = 2001)
    ) y
, (
    SELECT
        "wswscs"."d_week_seq" "d_week_seq2"
    , "sun_sales" "sun_sales2"
    , "mon_sales" "mon_sales2"
    , "tue_sales" "tue_sales2"
    , "wed_sales" "wed_sales2"
    , "thu_sales" "thu_sales2"
    , "fri_sales" "fri_sales2"
    , "sat_sales" "sat_sales2"
    FROM
        wswscs
    , tpcds.tiny.date_dim
    WHERE ("date_dim"."d_week_seq" = "wswscs"."d_week_seq")
        AND ("d_year" = (2001 + 1))
    ) z
WHERE ("d_week_seq1" = ("d_week_seq2" - 53))
ORDER BY "d_week_seq1" ASC

```

Results: completed in 2 sec

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```

[(5270, '6.05', '1.12', '3.93', '1.24', '1.22', '5.52', '3.90'), (5270, '6.05', '1.12', '3.93', '1.
24', '1.22', '5.52', '3.90'), (5270, '6.05', '1.12', '3.93', '1.24', '1.22', '5.52', '3.90'), (527
0, '6.05', '1.12', '3.93', '1.24', '1.22', '5.52', '3.90'), (5270, '6.05', '1.12', '3.93', '1.24',
'1.22', '5.52', '3.90')]

```

SQL name: ./benchmark/tpcds/q03.sql...

=====

```

SELECT
    "dt"."d_year"
, "item"."i_brand_id" "brand_id"
, "item"."i_brand" "brand"
, "sum"("ss_ext_sales_price") "sum_agg"
FROM
    tpcds.tiny.date_dim dt
, tpcds.tiny.store_sales
, tpcds.tiny.item
WHERE ("dt"."d_date_sk" = "store_sales"."ss_sold_date_sk")

```



```

AND ("store_sales"."ss_item_sk" = "item"."i_item_sk")
AND ("item"."i_manufact_id" = 128)
AND ("dt"."d_moy" = 11)
GROUP BY "dt"."d_year", "item"."i_brand", "item"."i_brand_id"
ORDER BY "dt"."d_year" ASC, "sum_agg" DESC, "brand_id" ASC
LIMIT 100

```

Results: completed in 2 sec

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```

[(1998, 7007010, 'brandbrand #10', '14247.33'), (1998, 3001001,
'amalgexporti #1', '8134.69'), (1998, 1004001, 'edu packamalg #1
', '2206.52'), (1998, 6004008, 'edu packcorp #8', '984.85'), (19
99, 3001001, 'amalgexporti #1', '7830.78')]

```

SQL name: ./benchmark/tpcds/q04.sql...

=====

WITH

```

year_total AS (
  SELECT
    "c_customer_id" "customer_id"
    , "c_first_name" "customer_first_name"
    , "c_last_name" "customer_last_name"
    , "c_preferred_cust_flag" "customer_preferred_cust_flag"
    , "c_birth_country" "customer_birth_country"
    , "c_login" "customer_login"
    , "c_email_address" "customer_email_address"
    , "d_year" "dyear"
    , "sum"((((("ss_ext_list_price" - "ss_ext_wholesale_cost") - "ss_ext_discount_amt") + "ss_ext_sale
les_price") / 2)) "year_total"
    , 's' "sale_type"
  FROM
    tpcds.tiny.customer
    , tpcds.tiny.store_sales
    , tpcds.tiny.date_dim
  WHERE ("c_customer_sk" = "ss_customer_sk")
    AND ("ss_sold_date_sk" = "d_date_sk")
  GROUP BY "c_customer_id", "c_first_name", "c_last_name", "c_preferred_cust_flag", "c_birth_count
ry", "c_login", "c_email_address", "d_year"
UNION ALL
  SELECT
    "c_customer_id" "customer_id"

```

```

    , "c_first_name" "customer_first_name"
    , "c_last_name" "customer_last_name"
    , "c_preferred_cust_flag" "customer_preferred_cust_flag"
    , "c_birth_country" "customer_birth_country"
    , "c_login" "customer_login"
    , "c_email_address" "customer_email_address"
    , "d_year" "dyear"
    , "sum"((((("cs_ext_list_price" - "cs_ext_wholesale_cost") - "cs_ext_discount_amt") + "cs_ext_sales_price") / 2)) "year_total"
    , 'c' "sale_type"
FROM
    tpcds.tiny.customer
    , tpcds.tiny.catalog_sales
    , tpcds.tiny.date_dim
WHERE ("c_customer_sk" = "cs_bill_customer_sk")
    AND ("cs_sold_date_sk" = "d_date_sk")
GROUP BY "c_customer_id", "c_first_name", "c_last_name", "c_preferred_cust_flag", "c_birth_country", "c_login", "c_email_address", "d_year"
UNION ALL
    SELECT
        "c_customer_id" "customer_id"
        , "c_first_name" "customer_first_name"
        , "c_last_name" "customer_last_name"
        , "c_preferred_cust_flag" "customer_preferred_cust_flag"
        , "c_birth_country" "customer_birth_country"
        , "c_login" "customer_login"
        , "c_email_address" "customer_email_address"
        , "d_year" "dyear"
        , "sum"((((("ws_ext_list_price" - "ws_ext_wholesale_cost") - "ws_ext_discount_amt") + "ws_ext_sales_price") / 2)) "year_total"
        , 'w' "sale_type"
    FROM
        tpcds.tiny.customer
        , tpcds.tiny.web_sales
        , tpcds.tiny.date_dim
    WHERE ("c_customer_sk" = "ws_bill_customer_sk")
        AND ("ws_sold_date_sk" = "d_date_sk")
    GROUP BY "c_customer_id", "c_first_name", "c_last_name", "c_preferred_cust_flag", "c_birth_country", "c_login", "c_email_address", "d_year"
)
SELECT
    "t_s_secyear"."customer_id"
    , "t_s_secyear"."customer_first_name"
    , "t_s_secyear"."customer_last_name"

```

```

, "t_s_secyear"."customer_preferred_cust_flag"
FROM
  year_total t_s_firstyear
, year_total t_s_secyear
, year_total t_c_firstyear
, year_total t_c_secyear
, year_total t_w_firstyear
, year_total t_w_secyear
WHERE ("t_s_secyear"."customer_id" = "t_s_firstyear"."customer_id")
  AND ("t_s_firstyear"."customer_id" = "t_c_secyear"."customer_id")
  AND ("t_s_firstyear"."customer_id" = "t_c_firstyear"."customer_id")
  AND ("t_s_firstyear"."customer_id" = "t_w_firstyear"."customer_id")
  AND ("t_s_firstyear"."customer_id" = "t_w_secyear"."customer_id")
  AND ("t_s_firstyear"."sale_type" = 's')
  AND ("t_c_firstyear"."sale_type" = 'c')
  AND ("t_w_firstyear"."sale_type" = 'w')
  AND ("t_s_secyear"."sale_type" = 's')
  AND ("t_c_secyear"."sale_type" = 'c')
  AND ("t_w_secyear"."sale_type" = 'w')
  AND ("t_s_firstyear"."dyear" = 2001)
  AND ("t_s_secyear"."dyear" = (2001 + 1))
  AND ("t_c_firstyear"."dyear" = 2001)
  AND ("t_c_secyear"."dyear" = (2001 + 1))
  AND ("t_w_firstyear"."dyear" = 2001)
  AND ("t_w_secyear"."dyear" = (2001 + 1))
  AND ("t_s_firstyear"."year_total" > 0)
  AND ("t_c_firstyear"."year_total" > 0)
  AND ("t_w_firstyear"."year_total" > 0)
  AND ((CASE WHEN ("t_c_firstyear"."year_total" > 0) THEN ("t_c_secyear"."year_total" / "t_c_first
year"."year_total") ELSE null END) > (CASE WHEN ("t_s_firstyear"."year_total" > 0) THEN ("t_s_secye
ar"."year_total" / "t_s_firstyear"."year_total") ELSE null END))
  AND ((CASE WHEN ("t_c_firstyear"."year_total" > 0) THEN ("t_c_secyear"."year_total" / "t_c_first
year"."year_total") ELSE null END) > (CASE WHEN ("t_w_firstyear"."year_total" > 0) THEN ("t_w_secye
ar"."year_total" / "t_w_firstyear"."year_total") ELSE null END))
ORDER BY "t_s_secyear"."customer_id" ASC, "t_s_secyear"."customer_first_name" ASC, "t_s_secyear"."c
ustomer_last_name" ASC, "t_s_secyear"."customer_preferred_cust_flag" ASC
LIMIT 100

```

Results: completed in 2 sec

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```
[('AAAAAAAADOCAAAAA', 'Joy', 'Baker', 'Y'), ('AAAAAAAHHMB
AAAAA', 'Eunice', 'Shaw', 'N'), ('AAAAAAAIIICAAAAA', 'Sherr
i', 'Tyler', 'Y'), ('AAAAAAAJCIAAAAAA', 'Maxine
', 'Carlson', 'N'), ('AAAAAAAJGBAAAAA', 'Bonnie', 'Harrison
', 'Y')]
```

SQL name: ./benchmark/tpcds/q05.sql...

=====

WITH

```
    ssr AS (
      SELECT
        "s_store_id"
      , "sum"("sales_price") "sales"
      , "sum"("profit") "profit"
      , "sum"("return_amt") "returns"
      , "sum"("net_loss") "profit_loss"
      FROM
        (
          SELECT
            "ss_store_sk" "store_sk"
          , "ss_sold_date_sk" "date_sk"
          , "ss_ext_sales_price" "sales_price"
          , "ss_net_profit" "profit"
          , CAST(0 AS DECIMAL(7,2)) "return_amt"
          , CAST(0 AS DECIMAL(7,2)) "net_loss"
          FROM
            tpcds.tiny.store_sales
        UNION ALL
          SELECT
            "sr_store_sk" "store_sk"
          , "sr_returned_date_sk" "date_sk"
          , CAST(0 AS DECIMAL(7,2)) "sales_price"
          , CAST(0 AS DECIMAL(7,2)) "profit"
          , "sr_return_amt" "return_amt"
          , "sr_net_loss" "net_loss"
          FROM
            tpcds.tiny.store_returns
        ) salesreturns
      , tpcds.tiny.date_dim
      , tpcds.tiny.store
      WHERE ("date_sk" = "d_date_sk")
        AND ("d_date" BETWEEN CAST('2000-08-23' AS DATE) AND (CAST('2000-08-23' AS DATE) + INTERVAL
'14' DAY))
```

```

        AND ("store_sk" = "s_store_sk")
    GROUP BY "s_store_id"
)
, csr AS (
    SELECT
        "cp_catalog_page_id"
        , "sum"("sales_price") "sales"
        , "sum"("profit") "profit"
        , "sum"("return_amt") "returns"
        , "sum"("net_loss") "profit_loss"
    FROM
        (
            SELECT
                "cs_catalog_page_sk" "page_sk"
                , "cs_sold_date_sk" "date_sk"
                , "cs_ext_sales_price" "sales_price"
                , "cs_net_profit" "profit"
                , CAST(0 AS DECIMAL(7,2)) "return_amt"
                , CAST(0 AS DECIMAL(7,2)) "net_loss"
            FROM
                tpcds.tiny.catalog_sales
        UNION ALL
            SELECT
                "cr_catalog_page_sk" "page_sk"
                , "cr_returned_date_sk" "date_sk"
                , CAST(0 AS DECIMAL(7,2)) "sales_price"
                , CAST(0 AS DECIMAL(7,2)) "profit"
                , "cr_return_amount" "return_amt"
                , "cr_net_loss" "net_loss"
            FROM
                tpcds.tiny.catalog_returns
        ) salesreturns
        , tpcds.tiny.date_dim
        , tpcds.tiny.catalog_page
    WHERE ("date_sk" = "d_date_sk")
        AND ("d_date" BETWEEN CAST('2000-08-23' AS DATE) AND (CAST('2000-08-23' AS DATE) + INTERVAL
'14' DAY))
        AND ("page_sk" = "cp_catalog_page_sk")
    GROUP BY "cp_catalog_page_id"
)
, wsr AS (
    SELECT
        "web_site_id"
        , "sum"("sales_price") "sales"

```

```

, "sum"("profit") "profit"
, "sum"("return_amt") "returns"
, "sum"("net_loss") "profit_loss"
FROM
(
  SELECT
    "ws_web_site_sk" "wsr_web_site_sk"
  , "ws_sold_date_sk" "date_sk"
  , "ws_ext_sales_price" "sales_price"
  , "ws_net_profit" "profit"
  , CAST(0 AS DECIMAL(7,2)) "return_amt"
  , CAST(0 AS DECIMAL(7,2)) "net_loss"
  FROM
    tpcds.tiny.web_sales
UNION ALL
  SELECT
    "ws_web_site_sk" "wsr_web_site_sk"
  , "wr_returned_date_sk" "date_sk"
  , CAST(0 AS DECIMAL(7,2)) "sales_price"
  , CAST(0 AS DECIMAL(7,2)) "profit"
  , "wr_return_amt" "return_amt"
  , "wr_net_loss" "net_loss"
  FROM
    (tpcds.tiny.web_returns
  LEFT JOIN tpcds.tiny.web_sales ON ("wr_item_sk" = "ws_item_sk")
    AND ("wr_order_number" = "ws_order_number"))
) salesreturns
, tpcds.tiny.date_dim
, tpcds.tiny.web_site
WHERE ("date_sk" = "d_date_sk")
  AND ("d_date" BETWEEN CAST('2000-08-23' AS DATE) AND (CAST('2000-08-23' AS DATE) + INTERVAL
'14' DAY))
  AND ("wsr_web_site_sk" = "web_site_sk")
GROUP BY "web_site_id"
)
SELECT
  "channel"
, "id"
, "sum"("sales") "sales"
, "sum"("returns") "returns"
, "sum"("profit") "profit"
FROM
(
  SELECT

```

```

        'tpcds.tiny.store channel' "channel"
      , "concat"('store', "s_store_id") "id"
      , "sales"
      , "returns"
      , ("profit" - "profit_loss") "profit"
    FROM
      ssr
  UNION ALL
    SELECT
      'catalog channel' "channel"
      , "concat"('catalog_page', "cp_catalog_page_id") "id"
      , "sales"
      , "returns"
      , ("profit" - "profit_loss") "profit"
    FROM
      csr
  UNION ALL
    SELECT
      'web channel' "channel"
      , "concat"('web_site', "web_site_id") "id"
      , "sales"
      , "returns"
      , ("profit" - "profit_loss") "profit"
    FROM
      wsr
  ) x
GROUP BY ROLLUP (channel, id)
ORDER BY "channel" ASC, "id" ASC
LIMIT 100

```

Results: completed in 2 sec

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```

[('catalog channel', 'catalog_pageAAAAAAAAAABAAAA', '3565.53', '0.00', '-7892.57'), ('catalog chan
nel', 'catalog_pageAAAAAAAAABABAAAA', '17651.76', '0.00', '4226.70'), ('catalog channel', 'catalog_
pageAAAAAAAAADCBAAAA', '8320.65', '0.00', '-944.83'), ('catalog channel', 'catalog_pageAAAAAAAEEAB
AAAA', '6839.68', '0.00', '1031.84'), ('catalog channel', 'catalog_pageAAAAAAAEECBAAAA', '19248.5
8', '0.00', '277.31')]

```

SQL name: ./benchmark/tpcds/q06.sql...

=====

```

SELECT
  "a"."ca_state" "STATE"

```

```

, "count"(*) "cnt"
FROM
  tpcds.tiny.customer_address a
, tpcds.tiny.customer c
, tpcds.tiny.store_sales s
, tpcds.tiny.date_dim d
, tpcds.tiny.item i
WHERE ("a"."ca_address_sk" = "c"."c_current_addr_sk")
  AND ("c"."c_customer_sk" = "s"."ss_customer_sk")
  AND ("s"."ss_sold_date_sk" = "d"."d_date_sk")
  AND ("s"."ss_item_sk" = "i"."i_item_sk")
  AND ("d"."d_month_seq" = (
    SELECT DISTINCT "d_month_seq"
    FROM
      tpcds.tiny.date_dim
    WHERE ("d_year" = 2001)
      AND ("d_moy" = 1)
  ))
  AND ("i"."i_current_price" > (DECIMAL '1.2' * (
    SELECT "avg"("j"."i_current_price")
    FROM
      tpcds.tiny.item j
    WHERE ("j"."i_category" = "i"."i_category")
  )))
GROUP BY "a"."ca_state"
HAVING ("count"(*) >= 10)
ORDER BY "cnt" ASC, "a"."ca_state" ASC
LIMIT 100

```

Results: completed in 2 sec

```

+++++
[('TX', 10)]

```

SQL name: ./benchmark/tpcds/q07.sql...

=====

```

SELECT
  "i_item_id"
, "avg"("ss_quantity") "agg1"
, "avg"("ss_list_price") "agg2"
, "avg"("ss_coupon_amt") "agg3"

```



```

, "avg"("ss_sales_price") "agg4"
FROM
  tpcds.tiny.store_sales
, tpcds.tiny.customer_demographics
, tpcds.tiny.date_dim
, tpcds.tiny.item
, tpcds.tiny.promotion
WHERE ("ss_sold_date_sk" = "d_date_sk")
  AND ("ss_item_sk" = "i_item_sk")
  AND ("ss_cdemo_sk" = "cd_demo_sk")
  AND ("ss_promo_sk" = "p_promo_sk")
  AND ("cd_gender" = 'M')
  AND ("cd_marital_status" = 'S')
  AND ("cd_education_status" = 'College')
  AND (("p_channel_email" = 'N')
    OR ("p_channel_event" = 'N'))
  AND ("d_year" = 2000)
GROUP BY "i_item_id"
ORDER BY "i_item_id" ASC
LIMIT 100

```

Results: completed in 2 sec

```

+++++
[('AAAAAAAAAFAAAAA', 71.0, '49.34', '0.00', '35.94'), ('AAAAAAAAABEAAAAA', 78.5, '41.97', '0.21',
'16.70'), ('AAAAAAAAABGAAAAA', 47.0, '4.34', '0.00', '0.78'), ('AAAAAAAAACCAAAAA', 56.0, '122.37',
'0.00', '83.21'), ('AAAAAAAAADFAAAAA', 5.0, '92.80', '0.00', '56.60')]

```

SQL name: ./benchmark/tpcds/q08.sql...

```

=====
SELECT
  "s_store_name"
, "sum"("ss_net_profit")
FROM
  tpcds.tiny.store_sales
, tpcds.tiny.date_dim
, tpcds.tiny.store
, (
  SELECT "ca_zip"
  FROM
    (

```

(

```
SELECT "substr"("ca_zip", 1, 5) "ca_zip"
FROM
    tpcds.tiny.customer_address
WHERE ("substr"("ca_zip", 1, 5) IN (
    '24128'
    , '57834'
    , '13354'
    , '15734'
    , '78668'
    , '76232'
    , '62878'
    , '45375'
    , '63435'
    , '22245'
    , '65084'
    , '49130'
    , '40558'
    , '25733'
    , '15798'
    , '87816'
    , '81096'
    , '56458'
    , '35474'
    , '27156'
    , '83926'
    , '18840'
    , '28286'
    , '24676'
    , '37930'
    , '77556'
    , '27700'
    , '45266'
    , '94627'
    , '62971'
    , '20548'
    , '23470'
    , '47305'
    , '53535'
    , '21337'
    , '26231'
    , '50412'
    , '69399'
```

, '17879'
, '51622'
, '43848'
, '21195'
, '83921'
, '15559'
, '67853'
, '15126'
, '16021'
, '26233'
, '53268'
, '10567'
, '91137'
, '76107'
, '11101'
, '59166'
, '38415'
, '61265'
, '71954'
, '15371'
, '11928'
, '15455'
, '98294'
, '68309'
, '69913'
, '59402'
, '58263'
, '25782'
, '18119'
, '35942'
, '33282'
, '42029'
, '17920'
, '98359'
, '15882'
, '45721'
, '60279'
, '18426'
, '64544'
, '25631'
, '43933'
, '37125'
, '98235'

, '10336'
, '24610'
, '68101'
, '56240'
, '40081'
, '86379'
, '44165'
, '33515'
, '88190'
, '84093'
, '27068'
, '99076'
, '36634'
, '50308'
, '28577'
, '39736'
, '33786'
, '71286'
, '26859'
, '55565'
, '98569'
, '70738'
, '19736'
, '64457'
, '17183'
, '28915'
, '26653'
, '58058'
, '89091'
, '54601'
, '24206'
, '14328'
, '55253'
, '82136'
, '67897'
, '56529'
, '72305'
, '67473'
, '62377'
, '22752'
, '57647'
, '62496'
, '41918'

, '36233'
, '86284'
, '54917'
, '22152'
, '19515'
, '63837'
, '18376'
, '42961'
, '10144'
, '36495'
, '58078'
, '38607'
, '91110'
, '64147'
, '19430'
, '17043'
, '45200'
, '63981'
, '48425'
, '22351'
, '30010'
, '21756'
, '14922'
, '14663'
, '77191'
, '60099'
, '29741'
, '36420'
, '21076'
, '91393'
, '28810'
, '96765'
, '23006'
, '18799'
, '49156'
, '98025'
, '23932'
, '67467'
, '30450'
, '50298'
, '29178'
, '89360'
, '32754'

, '63089'
, '87501'
, '87343'
, '29839'
, '30903'
, '81019'
, '18652'
, '73273'
, '25989'
, '20260'
, '68893'
, '53179'
, '30469'
, '28898'
, '31671'
, '24996'
, '18767'
, '64034'
, '91068'
, '51798'
, '51200'
, '63193'
, '39516'
, '72550'
, '72325'
, '51211'
, '23968'
, '86057'
, '10390'
, '85816'
, '45692'
, '65164'
, '21309'
, '18845'
, '68621'
, '92712'
, '68880'
, '90257'
, '47770'
, '13955'
, '70466'
, '21286'
, '67875'

, '82636'
, '36446'
, '79994'
, '72823'
, '40162'
, '41367'
, '41766'
, '22437'
, '58470'
, '11356'
, '76638'
, '68806'
, '25280'
, '67301'
, '73650'
, '86198'
, '16725'
, '38935'
, '13394'
, '61810'
, '81312'
, '15146'
, '71791'
, '31016'
, '72013'
, '37126'
, '22744'
, '73134'
, '70372'
, '30431'
, '39192'
, '35850'
, '56571'
, '67030'
, '22461'
, '88424'
, '88086'
, '14060'
, '40604'
, '19512'
, '72175'
, '51649'
, '19505'

, '24317'
, '13375'
, '81426'
, '18270'
, '72425'
, '45748'
, '55307'
, '53672'
, '52867'
, '56575'
, '39127'
, '30625'
, '10445'
, '39972'
, '74351'
, '26065'
, '83849'
, '42666'
, '96976'
, '68786'
, '77721'
, '68908'
, '66864'
, '63792'
, '51650'
, '31029'
, '26689'
, '66708'
, '11376'
, '20004'
, '31880'
, '96451'
, '41248'
, '94898'
, '18383'
, '60576'
, '38193'
, '48583'
, '13595'
, '76614'
, '24671'
, '46820'
, '82276'

, '10516'
, '11634'
, '45549'
, '88885'
, '18842'
, '90225'
, '18906'
, '13376'
, '84935'
, '78890'
, '58943'
, '15765'
, '50016'
, '69035'
, '49448'
, '39371'
, '41368'
, '33123'
, '83144'
, '14089'
, '94945'
, '73241'
, '19769'
, '47537'
, '38122'
, '28587'
, '76698'
, '22927'
, '56616'
, '34425'
, '96576'
, '78567'
, '97789'
, '94983'
, '79077'
, '57855'
, '97189'
, '46081'
, '48033'
, '19849'
, '28488'
, '28545'
, '72151'

, '69952'
, '43285'
, '26105'
, '76231'
, '15723'
, '25486'
, '39861'
, '83933'
, '75691'
, '46136'
, '61547'
, '66162'
, '25858'
, '22246'
, '51949'
, '27385'
, '77610'
, '34322'
, '51061'
, '68100'
, '61860'
, '13695'
, '44438'
, '90578'
, '96888'
, '58048'
, '99543'
, '73171'
, '56691'
, '64528'
, '56910'
, '83444'
, '30122'
, '68014'
, '14171'
, '16807'
, '83041'
, '34102'
, '51103'
, '79777'
, '17871'
, '12305'
, '22685'

```

        , '94167'
        , '28709'
        , '35258'
        , '57665'
        , '71256'
        , '57047'
        , '11489'
        , '31387'
        , '68341'
        , '78451'
        , '14867'
        , '25103'
        , '35458'
        , '25003'
        , '54364'
        , '73520'
        , '32213'
        , '35576'))
    ) INTERSECT (
    SELECT "ca_zip"
    FROM
    (
    SELECT
        "substr"("ca_zip", 1, 5) "ca_zip"
        , "count"(*) "cnt"
    FROM
        tpcds.tiny.customer_address
        , tpcds.tiny.customer
    WHERE ("ca_address_sk" = "c_current_addr_sk")
        AND ("c_preferred_cust_flag" = 'Y')
    GROUP BY "ca_zip"
    HAVING ("count"(*) > 10)
    ) a1
    ) a2
) v1
WHERE ("ss_store_sk" = "s_store_sk")
    AND ("ss_sold_date_sk" = "d_date_sk")
    AND ("d_qoy" = 2)
    AND ("d_year" = 1998)
    AND ("substr"("s_zip", 1, 2) = "substr"("v1"."ca_zip", 1, 2))
GROUP BY "s_store_name"
ORDER BY "s_store_name" ASC
LIMIT 100

```

Results: completed in 2 sec

+++++

[]

SQL name: ./benchmark/tpcds/q09.sql...

=====

```
SELECT
  (CASE WHEN ((
    SELECT "count"(*)
    FROM
      tpcds.tiny.store_sales
    WHERE ("ss_quantity" BETWEEN 1 AND 20)
  ) > 74129) THEN (
    SELECT "avg"("ss_ext_discount_amt")
    FROM
      tpcds.tiny.store_sales
    WHERE ("ss_quantity" BETWEEN 1 AND 20)
  ) ELSE (
    SELECT "avg"("ss_net_paid")
    FROM
      tpcds.tiny.store_sales
    WHERE ("ss_quantity" BETWEEN 1 AND 20)
  ) END) "bucket1"
, (CASE WHEN ((
    SELECT "count"(*)
    FROM
      tpcds.tiny.store_sales
    WHERE ("ss_quantity" BETWEEN 21 AND 40)
  ) > 122840) THEN (
    SELECT "avg"("ss_ext_discount_amt")
    FROM
      tpcds.tiny.store_sales
    WHERE ("ss_quantity" BETWEEN 21 AND 40)
  ) ELSE (
    SELECT "avg"("ss_net_paid")
    FROM
      tpcds.tiny.store_sales
    WHERE ("ss_quantity" BETWEEN 21 AND 40)
```

```

) END) "bucket2"
, (CASE WHEN ((
    SELECT "count"(*)
    FROM
        tpcds.tiny.store_sales
    WHERE ("ss_quantity" BETWEEN 41 AND 60)
) > 56580) THEN (
    SELECT "avg"("ss_ext_discount_amt")
    FROM
        tpcds.tiny.store_sales
    WHERE ("ss_quantity" BETWEEN 41 AND 60)
) ELSE (
    SELECT "avg"("ss_net_paid")
    FROM
        tpcds.tiny.store_sales
    WHERE ("ss_quantity" BETWEEN 41 AND 60)
) END) "bucket3"
, (CASE WHEN ((
    SELECT "count"(*)
    FROM
        tpcds.tiny.store_sales
    WHERE ("ss_quantity" BETWEEN 61 AND 80)
) > 10097) THEN (
    SELECT "avg"("ss_ext_discount_amt")
    FROM
        tpcds.tiny.store_sales
    WHERE ("ss_quantity" BETWEEN 61 AND 80)
) ELSE (
    SELECT "avg"("ss_net_paid")
    FROM
        tpcds.tiny.store_sales
    WHERE ("ss_quantity" BETWEEN 61 AND 80)
) END) "bucket4"
, (CASE WHEN ((
    SELECT "count"(*)
    FROM
        tpcds.tiny.store_sales
    WHERE ("ss_quantity" BETWEEN 81 AND 100)
) > 165306) THEN (
    SELECT "avg"("ss_ext_discount_amt")
    FROM
        tpcds.tiny.store_sales
    WHERE ("ss_quantity" BETWEEN 81 AND 100)

```

```

) ELSE (
  SELECT "avg"("ss_net_paid")
  FROM
    tpcds.tiny.store_sales
  WHERE ("ss_quantity" BETWEEN 81 AND 100)
) END) "bucket5"
FROM
  tpcds.tiny.reason
WHERE ("r_reason_sk" = 1)

```

Results: completed in 2 sec

+++++

[('357.51', '1022.51', '1733.56', '262.32', '3077.37')]

SQL name: ./benchmark/tpcds/q10.sql...

=====

```

SELECT
  "cd_gender"
, "cd_marital_status"
, "cd_education_status"
, "count"(*) "cnt1"
, "cd_purchase_estimate"
, "count"(*) "cnt2"
, "cd_credit_rating"
, "count"(*) "cnt3"
, "cd_dep_count"
, "count"(*) "cnt4"
, "cd_dep_employed_count"
, "count"(*) "cnt5"
, "cd_dep_college_count"
, "count"(*) "cnt6"
FROM
  tpcds.tiny.customer c
, tpcds.tiny.customer_address ca
, tpcds.tiny.customer_demographics
WHERE ("c"."c_current_addr_sk" = "ca"."ca_address_sk")
  AND ("ca_county" IN ('Rush County', 'Toole County', 'Jefferson County', 'Dona Ana County', 'La P
orte County'))
  AND ("cd_demo_sk" = "c"."c_current_demo_sk")
  AND (EXISTS (

```

```

SELECT *
FROM
    tpcds.tiny.store_sales
, tpcds.tiny.date_dim
WHERE ("c"."c_customer_sk" = "ss_customer_sk")
    AND ("ss_sold_date_sk" = "d_date_sk")
    AND ("d_year" = 2002)
    AND ("d_moy" BETWEEN 1 AND (1 + 3))
))
AND ((EXISTS (
    SELECT *
    FROM
        tpcds.tiny.web_sales
    , tpcds.tiny.date_dim
    WHERE ("c"."c_customer_sk" = "ws_bill_customer_sk")
        AND ("ws_sold_date_sk" = "d_date_sk")
        AND ("d_year" = 2002)
        AND ("d_moy" BETWEEN 1 AND (1 + 3))
    ))
OR (EXISTS (
    SELECT *
    FROM
        tpcds.tiny.catalog_sales
    , tpcds.tiny.date_dim
    WHERE ("c"."c_customer_sk" = "cs_ship_customer_sk")
        AND ("cs_sold_date_sk" = "d_date_sk")
        AND ("d_year" = 2002)
        AND ("d_moy" BETWEEN 1 AND (1 + 3))
    )))
GROUP BY "cd_gender", "cd_marital_status", "cd_education_status", "cd_purchase_estimate", "cd_credit_rating", "cd_dep_count", "cd_dep_employed_count", "cd_dep_college_count"
ORDER BY "cd_gender" ASC, "cd_marital_status" ASC, "cd_education_status" ASC, "cd_purchase_estimate" ASC, "cd_credit_rating" ASC, "cd_dep_count" ASC, "cd_dep_employed_count" ASC, "cd_dep_college_count" ASC
LIMIT 100

```

Traceback (most recent call last):

File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.py", line 955, in fetchone

row = dbapi_cursor.fetchone()

File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 106,

```

in fetchone
    self._fetch_while(lambda: not self._data and self._state != self._STATE_FINISHED)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 46, i
n _fetch_while
    self._fetch_more()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 308,
in _fetch_more
    self._process_response(self._requests_session.get(self._nextUri, **self._requests_kwargs))
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 349,
in _process_response
    raise DatabaseError(response_json['error'])
pyhive.exc.DatabaseError: {'message': 'Query exceeded per-node user memory limit of 102.40MB [Alloc
ated: 102.40MB, Delta: 30.34kB, Top Consumers: {HashBuilderOperator=102.40MB, PartitionedOutputOper
ator=7.17MB, ScanFilterAndProjectOperator=5.02MB}, Details: [{"taskId":"3.0.0","reservation":"100.3
9MB","topConsumers":[{"type":"HashBuilderOperator","planNodeId":"4","reservations":["6.51MB","6.33M
B","6.28MB","6.28MB","6.27MB","6.27MB","6.26MB","6.26MB","6.25MB","6.25MB","6.25MB","6.24MB","6.24M
B","6.24MB","6.23MB","6.22MB"],"total":"100.39MB","info":"INNER;PARTITIONED;"}]},{taskId":"7.0.
0","reservation":"7.51MB","topConsumers":[{"type":"PartitionedOutputOperator","planNodeId":"234
5","reservations":["1.25MB","1.25MB","1.25MB","1.25MB"],"total":"5.01MB"},{"type":"ScanFilterAndPro
jectOperator","planNodeId":"2345","reservations":["1.25MB","1.25MB","1.58kB","1.58kB"],"total":"2.5
1MB"}]},{taskId":"9.0.0","reservation":"2.33MB","topConsumers":[{"type":"ScanFilterAndProjectOpera
tor","planNodeId":"2347","reservations":["1.25MB"],"total":"1.25MB"},{"type":"PartitionedOutputOper
ator","planNodeId":"2347","reservations":["1.08MB"],"total":"1.08MB"}]}}', 'errorCode': 131079, 'e
rrorName': 'EXCEEDED_LOCAL_MEMORY_LIMIT', 'errorType': 'INSUFFICIENT_RESOURCES', 'boolean': False,
'failureInfo': {'type': 'com.facebook.presto.ExceededMemoryLimitException', 'message': 'Query excee
ded per-node user memory limit of 102.40MB [Allocated: 102.40MB, Delta: 30.34kB, Top Consumers: {Ha
shBuilderOperator=102.40MB, PartitionedOutputOperator=7.17MB, ScanFilterAndProjectOperator=5.02MB},
Details: [{"taskId":"3.0.0","reservation":"100.39MB","topConsumers":[{"type":"HashBuilderOperato
r","planNodeId":"4","reservations":["6.51MB","6.33MB","6.28MB","6.28MB","6.27MB","6.27MB","6.26M
B","6.26MB","6.25MB","6.25MB","6.25MB","6.24MB","6.24MB","6.24MB","6.23MB","6.22MB"],"total":"100.3
9MB","info":"INNER;PARTITIONED;"}]},{taskId":"7.0.0","reservation":"7.51MB","topConsumers":[{"typ
e":"PartitionedOutputOperator","planNodeId":"2345","reservations":["1.25MB","1.25MB","1.25MB","1.25
MB"],"total":"5.01MB"},{"type":"ScanFilterAndProjectOperator","planNodeId":"2345","reservations":
["1.25MB","1.25MB","1.58kB","1.58kB"],"total":"2.51MB"}]},{taskId":"9.0.0","reservation":"2.33M
B","topConsumers":[{"type":"ScanFilterAndProjectOperator","planNodeId":"2347","reservations":["1.25
MB"],"total":"1.25MB"},{"type":"PartitionedOutputOperator","planNodeId":"2347","reservations":["1.0
8MB"],"total":"1.08MB"}]}}', 'suppressed': [], 'stack': ['com.facebook.presto.ExceededMemoryLimitE
xception.exceededLocalUserMemoryLimit(ExceededMemoryLimitException.java:49)', 'com.facebook.presto.
memory.QueryContext.enforceUserMemoryLimit(QueryContext.java:496)', 'com.facebook.presto.memory.Que
ryContext.updateUserMemory(QueryContext.java:192)', 'com.facebook.presto.memory.QueryContext$QueryM
emoryReservationHandler.reserveMemory(QueryContext.java:462)', 'com.facebook.presto.memory.context.
RootAggregatedMemoryContext.updateBytes(RootAggregatedMemoryContext.java:37)', 'com.facebook.prest
o.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)',

```



```
'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.SimpleLocalMemoryContext.setBytes(SimpleLocalMemoryContext.java:82)', 'com.facebook.presto.operator.OperatorContext$InternalLocalMemoryContext.setBytes(OperatorContext.java:672)', 'com.facebook.presto.operator.HashBuilderOperator.updateIndex(HashBuilderOperator.java:358)', 'com.facebook.presto.operator.HashBuilderOperator.addInput(HashBuilderOperator.java:345)', 'com.facebook.presto.operator.Driver.processInternal(Driver.java:428)', 'com.facebook.presto.operator.Driver.lambda$processFor$9(Driver.java:301)', 'com.facebook.presto.operator.Driver.tryWithLock(Driver.java:722)', 'com.facebook.presto.operator.Driver.processFor(Driver.java:294)', 'com.facebook.presto.execution.SqlTaskExecution$DriverSplitRunner.processFor(SqlTaskExecution.java:1077)', 'com.facebook.presto.execution.executor.PrioritizedSplitRunner.process(PrioritizedSplitRunner.java:162)', 'com.facebook.presto.execution.executor.TaskExecutor$TaskRunner.run(TaskExecutor.java:599)', 'com.facebook.presto.$gen.Presto_0_263_b9fdfd4____20211010_164639_1.run(Unknown Source)', 'java.base/java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1128)', 'java.base/java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:628)', 'java.base/java.lang.Thread.run(Thread.java:829)']}]}
```

The above exception was the direct cause of the following exception:

Traceback (most recent call last):

```
File "/tmp/ipykernel_394536/722970930.py", line 15, in <module>
    for row in rs:
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/result.py", line 381, in iterrows
    for row in self._fetchiter_impl():
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.py", line 1788, in _fetchiter_impl
    row = fetchone(self, self.cursor)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.py", line 960, in fetchone
    self.handle_exception(result, dbapi_cursor, e)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.py", line 941, in handle_exception
    result.connection._handle_dbapi_exception(
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py", line 2023, in _handle_dbapi_exception
    util.raise_(
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/util/compat.py", line 207, in raise_
    raise exception
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.py", line 955, in fetchone
```

```

        row = dbapi_cursor.fetchone()
    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 106,
in fetchone
        self._fetch_while(lambda: not self._data and self._state != self._STATE_FINISHED)
    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 46, i
n _fetch_while
        self._fetch_more()
    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 308,
in _fetch_more
        self._process_response(self._requests_session.get(self._nextUri, **self._requests_kwargs))
    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 349,
in _process_response
        raise DatabaseError(response_json['error'])
sqlalchemy.exc.DatabaseError: (pyhive.exc.DatabaseError) {'message': 'Query exceeded per-node user
memory limit of 102.40MB [Allocated: 102.40MB, Delta: 30.34kB, Top Consumers: {HashBuilderOperator=
102.40MB, PartitionedOutputOperator=7.17MB, ScanFilterAndProjectOperator=5.02MB}, Details: [{"taskI
d":"3.0.0","reservation":"100.39MB","topConsumers":[{"type":"HashBuilderOperator","planNodeI
d":"4","reservations":["6.51MB","6.33MB","6.28MB","6.28MB","6.27MB","6.27MB","6.26MB","6.26MB","6.2
5MB","6.25MB","6.25MB","6.24MB","6.24MB","6.24MB","6.23MB","6.22MB"],"total":"100.39MB","info":"INN
ER;PARTITIONED;"}]},{ "taskId":"7.0.0","reservation":"7.51MB","topConsumers":[{"type":"PartitionedOu
tputOperator","planNodeId":"2345","reservations":["1.25MB","1.25MB","1.25MB","1.25MB"],"total":"5.0
1MB"}, {"type":"ScanFilterAndProjectOperator","planNodeId":"2345","reservations":["1.25MB","1.25M
B","1.58kB","1.58kB"],"total":"2.51MB"}]},{ "taskId":"9.0.0","reservation":"2.33MB","topConsumers":
[{"type":"ScanFilterAndProjectOperator","planNodeId":"2347","reservations":["1.25MB"],"total":"1.25
MB"}, {"type":"PartitionedOutputOperator","planNodeId":"2347","reservations":["1.08MB"],"total":"1.0
8MB"}]}]}', 'errorCode': 131079, 'errorName': 'EXCEEDED_LOCAL_MEMORY_LIMIT', 'errorType': 'INSUFFIC
IENT_RESOURCES', 'boolean': False, 'failureInfo': {'type': 'com.facebook.presto.ExceededMemoryLimit
Exception', 'message': 'Query exceeded per-node user memory limit of 102.40MB [Allocated: 102.40MB,
Delta: 30.34kB, Top Consumers: {HashBuilderOperator=102.40MB, PartitionedOutputOperator=7.17MB, Sca
nFilterAndProjectOperator=5.02MB}, Details: [{"taskId":"3.0.0","reservation":"100.39MB","topConsume
rs":[{"type":"HashBuilderOperator","planNodeId":"4","reservations":["6.51MB","6.33MB","6.28MB","6.2
8MB","6.27MB","6.27MB","6.26MB","6.26MB","6.25MB","6.25MB","6.25MB","6.24MB","6.24MB","6.24MB","6.2
3MB","6.22MB"],"total":"100.39MB","info":"INNER;PARTITIONED;"}]},{ "taskId":"7.0.0","reservatio
n":"7.51MB","topConsumers":[{"type":"PartitionedOutputOperator","planNodeId":"2345","reservations":
["1.25MB","1.25MB","1.25MB","1.25MB"],"total":"5.01MB"}, {"type":"ScanFilterAndProjectOperator","pla
nNodeId":"2345","reservations":["1.25MB","1.25MB","1.58kB","1.58kB"],"total":"2.51MB"}]},{ "taskI
d":"9.0.0","reservation":"2.33MB","topConsumers":[{"type":"ScanFilterAndProjectOperator","planNodeI
d":"2347","reservations":["1.25MB"],"total":"1.25MB"}, {"type":"PartitionedOutputOperator","planNode
Id":"2347","reservations":["1.08MB"],"total":"1.08MB"}]}]}', 'suppressed': [], 'stack': ['com.faceb
ook.presto.ExceededMemoryLimitException.exceededLocalUserMemoryLimit(ExceededMemoryLimitException.j
ava:49)', 'com.facebook.presto.memory.QueryContext.enforceUserMemoryLimit(QueryContext.java:496)',
'com.facebook.presto.memory.QueryContext.updateUserMemory(QueryContext.java:192)', 'com.facebook.pr
esto.memory.QueryContext$QueryMemoryReservationHandler.reserveMemory(QueryContext.java:462)', 'com.

```



```

WHERE ("c_customer_sk" = "ss_customer_sk")
      AND ("ss_sold_date_sk" = "d_date_sk")
GROUP BY "c_customer_id", "c_first_name", "c_last_name", "c_preferred_cust_flag", "c_birth_count
ry", "c_login", "c_email_address", "d_year"
UNION ALL      SELECT
      "c_customer_id" "customer_id"
      , "c_first_name" "customer_first_name"
      , "c_last_name" "customer_last_name"
      , "c_preferred_cust_flag" "customer_preferred_cust_flag"
      , "c_birth_country" "customer_birth_country"
      , "c_login" "customer_login"
      , "c_email_address" "customer_email_address"
      , "d_year" "dyear"
      , "sum" (("ws_ext_list_price" - "ws_ext_discount_amt")) "year_total"
      , 'w' "sale_type"
FROM
      tpcds.tiny.customer
      , tpcds.tiny.web_sales
      , tpcds.tiny.date_dim
WHERE ("c_customer_sk" = "ws_bill_customer_sk")
      AND ("ws_sold_date_sk" = "d_date_sk")
GROUP BY "c_customer_id", "c_first_name", "c_last_name", "c_preferred_cust_flag", "c_birth_count
ry", "c_login", "c_email_address", "d_year"
)
SELECT
      "t_s_secyear"."customer_id"
      , "t_s_secyear"."customer_first_name"
      , "t_s_secyear"."customer_last_name"
      , "t_s_secyear"."customer_preferred_cust_flag"
      , "t_s_secyear"."customer_birth_country"
      , "t_s_secyear"."customer_login"
FROM
      year_total t_s_firstyear
      , year_total t_s_secyear
      , year_total t_w_firstyear
      , year_total t_w_secyear
WHERE ("t_s_secyear"."customer_id" = "t_s_firstyear"."customer_id")
      AND ("t_s_firstyear"."customer_id" = "t_w_secyear"."customer_id")
      AND ("t_s_firstyear"."customer_id" = "t_w_firstyear"."customer_id")
      AND ("t_s_firstyear"."sale_type" = 's')
      AND ("t_w_firstyear"."sale_type" = 'w')
      AND ("t_s_secyear"."sale_type" = 's')
      AND ("t_w_secyear"."sale_type" = 'w')

```

```

AND ("t_s_firstyear"."dyear" = 2001)
AND ("t_s_secyear"."dyear" = (2001 + 1))
AND ("t_w_firstyear"."dyear" = 2001)
AND ("t_w_secyear"."dyear" = (2001 + 1))
AND ("t_s_firstyear"."year_total" > 0)
AND ("t_w_firstyear"."year_total" > 0)
AND ((CASE WHEN ("t_w_firstyear"."year_total" > 0) THEN ("t_w_secyear"."year_total" / "t_w_first
year"."year_total") ELSE DECIMAL '0.0' END) > (CASE WHEN ("t_s_firstyear"."year_total" > 0) THEN
("t_s_secyear"."year_total" / "t_s_firstyear"."year_total") ELSE DECIMAL '0.0' END))
ORDER BY "t_s_secyear"."customer_id" ASC, "t_s_secyear"."customer_first_name" ASC, "t_s_secyear"."c
ustomer_last_name" ASC, "t_s_secyear"."customer_preferred_cust_flag" ASC
LIMIT 100

```

Results: completed in 2 sec

```

+++++
[('AAAAAAAABMDAAAA', 'Jose', 'Guzman', 'N', 'MARSHALL ISLA
NDS', None), ('AAAAAAAFLAAAA', 'Joseph', 'Riley', 'N', 'B
ELIZE', None), ('AAAAAAAFNCAAAAA', 'Jennifer', 'Fitzpatrick', 'N',
'UNITED ARAB EMIRATES', None), ('AAAAAAAJCAAAAA', 'Maxine', 'Carlson
', 'N', 'ISLE OF MAN', None), ('AAAAAAAJGBAAAA', 'Bonnie', 'Harrison
', 'Y', 'EL SALVADOR', None)]

```

SQL name: ./benchmark/tpcds/q12.sql...

=====

```

SELECT
  "i_item_id"
, "i_item_desc"
, "i_category"
, "i_class"
, "i_current_price"
, "sum"("ws_ext_sales_price") "tpcds.tiny.itemrevenue"
, ((("sum"("ws_ext_sales_price") * 100) / "sum"("sum"("ws_ext_sales_price"))) OVER (PARTITION BY "i_c
lass")) "revenueration"
FROM
  tpcds.tiny.web_sales
, tpcds.tiny.item
, tpcds.tiny.date_dim
WHERE ("ws_item_sk" = "i_item_sk")
  AND ("i_category" IN ('Sports', 'Books', 'Home'))

```

```

        AND ("ws_sold_date_sk" = "d_date_sk")
        AND (CAST("d_date" AS DATE) BETWEEN CAST('1999-02-22' AS DATE) AND (CAST('1999-02-22' AS DATE) +
INTERVAL '30' DAY))
GROUP BY "i_item_id", "i_item_desc", "i_category", "i_class", "i_current_price"
ORDER BY "i_category" ASC, "i_class" ASC, "i_item_id" ASC, "i_item_desc" ASC, "revenue_ratio" ASC
LIMIT 100

```

Traceback (most recent call last):

```

  File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py", line 1815, in _execute_context
    result = context._setup_result_proxy()
  File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/default.py", line 1409, in _setup_result_proxy
    result = self._setup_dml_or_text_result()
  File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/default.py", line 1491, in _setup_dml_or_text_result
    strategy.alternate_cursor_description or self.cursor.description
  File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 225, in description
    self._fetch_while(
  File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 46, in _fetch_while
    self._fetch_more()
  File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 308, in _fetch_more
    self._process_response(self._requests_session.get(self._nextUri, **self._requests_kwargs))
  File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 349, in _process_response
    raise DatabaseError(response_json['error'])
pyhive.exc.DatabaseError: {'message': 'Division by zero', 'errorCode': 8, 'errorName': 'DIVISION_BY_ZERO', 'errorType': 'USER_ERROR', 'boolean': False, 'failureInfo': {'type': 'com.facebook.presto.spi.PrestoException', 'message': 'Division by zero', 'suppressed': [], 'stack': ['com.facebook.presto.type.DecimalOperators.divideLongLongLong(DecimalOperators.java:414)', 'com.facebook.presto.$gen.PageProjectionWork_20211021_030205_308.evaluate(Unknown Source)', 'com.facebook.presto.$gen.PageProjectionWork_20211021_030205_308.process(Unknown Source)', 'com.facebook.presto.operator.project.PageProcessor$ProjectSelectedPositions.processBatch(PageProcessor.java:326)', 'com.facebook.presto.operator.project.PageProcessor$ProjectSelectedPositions.process(PageProcessor.java:197)', 'com.facebook.presto.operator.WorkProcessorUtils$ProcessWorkProcessor.process(WorkProcessorUtils.java:315)', 'com.facebook.presto.operator.WorkProcessorUtils$YieldingIterator.computeNext(WorkProcessorUtils.java:79)', 'com.facebook.presto.operator.WorkProcessorUtils$YieldingIterator.computeNext(WorkProcessorUtils.java:65)', 'com.google.common.collect.AbstractIterator.tryToComputeNext(AbstractIterator.java:

```

```
a:141)', 'com.google.common.collect.AbstractIterator.hasNext(AbstractIterator.java:136)', 'com.facebook.presto.operator.project.MergingPageOutput.getOutput(MergingPageOutput.java:113)', 'com.facebook.presto.operator.FilterAndProjectOperator.getOutput(FilterAndProjectOperator.java:102)', 'com.facebook.presto.operator.Driver.processInternal(Driver.java:418)', 'com.facebook.presto.operator.Driver.lambda$processFor$9(Driver.java:301)', 'com.facebook.presto.operator.Driver.tryWithLock(Driver.java:722)', 'com.facebook.presto.operator.Driver.processFor(Driver.java:294)', 'com.facebook.presto.execution.SqlTaskExecution$DriverSplitRunner.processFor(SqlTaskExecution.java:1077)', 'com.facebook.presto.execution.executor.PrioritizedSplitRunner.process(PrioritizedSplitRunner.java:162)', 'com.facebook.presto.execution.executor.TaskExecutor$TaskRunner.run(TaskExecutor.java:599)', 'com.facebook.presto.$gen.Presto_0_263_b9fd4d4_20211010_164639_1.run(Unknown Source)', 'java.base/java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1128)', 'java.base/java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:628)', 'java.base/java.lang.Thread.run(Thread.java:829)']}]}
```

The above exception was the direct cause of the following exception:

Traceback (most recent call last):

```
File "/tmp/ipykernel_394536/722970930.py", line 13, in <module>
    rs = conn.execute(sql)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py", line 1271, in execute
    return self._exec_driver_sql(
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py", line 1575, in _exec_driver_sql
    ret = self._execute_context(
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py", line 1842, in _execute_context
    self._handle_dbapi_exception(
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py", line 2023, in _handle_dbapi_exception
    util.raise_(
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/util/compat.py", line 207, in raise_
    raise exception
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py", line 1815, in _execute_context
    result = context._setup_result_proxy()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/default.py", line 1409, in _setup_result_proxy
    result = self._setup_dml_or_text_result()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/default.py", line 1491, in _setup_dml_or_text_result
    strategy.alternate_cursor_description or self.cursor.description
```

```

File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 225,
in description
    self._fetch_while(
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 46, i
n _fetch_while
    self._fetch_more()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 308,
in _fetch_more
    self._process_response(self._requests_session.get(self._nextUri, **self._requests_kwargs))
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 349,
in _process_response
    raise DatabaseError(response_json['error'])
sqlalchemy.exc.DatabaseError: (pyhive.exc.DatabaseError) {'message': 'Division by zero', 'errorCod
e': 8, 'errorName': 'DIVISION_BY_ZERO', 'errorType': 'USER_ERROR', 'boolean': False, 'failureInfo':
{'type': 'com.facebook.presto.spi.PrestoException', 'message': 'Division by zero', 'suppressed':
[], 'stack': ['com.facebook.presto.type.DecimalOperators.divideLongLongLong(DecimalOperators.java:4
14)', 'com.facebook.presto.$gen.PageProjectionWork_20211021_030205_308.evaluate(Unknown Source)',
'com.facebook.presto.$gen.PageProjectionWork_20211021_030205_308.process(Unknown Source)', 'com.fac
ebook.presto.operator.project.PageProcessor$ProjectSelectedPositions.processBatch(PageProcessor.jav
a:326)', 'com.facebook.presto.operator.project.PageProcessor$ProjectSelectedPositions.process(PageP
rocessor.java:197)', 'com.facebook.presto.operator.WorkProcessorUtils$ProcessWorkProcessor.process
(WorkProcessorUtils.java:315)', 'com.facebook.presto.operator.WorkProcessorUtils$YieldingIterator.c
omputeNext(WorkProcessorUtils.java:79)', 'com.facebook.presto.operator.WorkProcessorUtils$YieldingI
terator.computeNext(WorkProcessorUtils.java:65)', 'com.google.common.collect.AbstractIterator.tryTo
ComputeNext(AbstractIterator.java:141)', 'com.google.common.collect.AbstractIterator.hasNext(Abstra
ctIterator.java:136)', 'com.facebook.presto.operator.project.MergingPageOutput.getOutput(MergingPag
eOutput.java:113)', 'com.facebook.presto.operator.FilterAndProjectOperator.getOutput(FilterAndProje
ctOperator.java:102)', 'com.facebook.presto.operator.Driver.processInternal(Driver.java:418)', 'co
m.facebook.presto.operator.Driver.lambda$processFor$9(Driver.java:301)', 'com.facebook.presto.opera
tor.Driver.tryWithLock(Driver.java:722)', 'com.facebook.presto.operator.Driver.processFor(Driver.ja
va:294)', 'com.facebook.presto.execution.SqlTaskExecution$DriverSplitRunner.processFor(SqlTaskExecu
tion.java:1077)', 'com.facebook.presto.execution.executor.PrioritizedSplitRunner.process(Prioritize
dSplitRunner.java:162)', 'com.facebook.presto.execution.executor.TaskExecutor$TaskRunner.run(TaskEx
ecutor.java:599)', 'com.facebook.presto.$gen.Presto_0_263_b9fd4fd4_20211010_164639_1.run(Unknown
Source)', 'java.base/java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:112
8)', 'java.base/java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:628)',
'java.base/java.lang.Thread.run(Thread.java:829)']}
[SQL: SELECT
    "i_item_id"
, "i_item_desc"
, "i_category"
, "i_class"
, "i_current_price"

```



```

, "sum"("ws_ext_sales_price") "tpcds.tiny.itemrevenue"
, ((("sum"("ws_ext_sales_price") * 100) / "sum"("sum"("ws_ext_sales_price"))) OVER (PARTITION BY "i_c
lass")) "revenueration"
FROM
    tpcds.tiny.web_sales
, tpcds.tiny.item
, tpcds.tiny.date_dim
WHERE ("ws_item_sk" = "i_item_sk")
    AND ("i_category" IN ('Sports', 'Books', 'Home'))
    AND ("ws_sold_date_sk" = "d_date_sk")
    AND (CAST("d_date" AS DATE) BETWEEN CAST('1999-02-22' AS DATE) AND (CAST('1999-02-22' AS DATE) +
INTERVAL '30' DAY))
GROUP BY "i_item_id", "i_item_desc", "i_category", "i_class", "i_current_price"
ORDER BY "i_category" ASC, "i_class" ASC, "i_item_id" ASC, "i_item_desc" ASC, "revenueration" ASC
LIMIT 100
]

```

(Background on this error at: <https://sqlalche.me/e/14/4xp6>) (<https://sqlalche.me/e/14/4xp6>)

SQL name: ./benchmark/tpcds/q13.sql...

=====

```

SELECT
    "avg"("ss_quantity")
, "avg"("ss_ext_sales_price")
, "avg"("ss_ext_wholesale_cost")
, "sum"("ss_ext_wholesale_cost")
FROM
    tpcds.tiny.store_sales
, tpcds.tiny.store
, tpcds.tiny.customer_demographics
, tpcds.tiny.household_demographics
, tpcds.tiny.customer_address
, tpcds.tiny.date_dim
WHERE ("s_store_sk" = "ss_store_sk")
    AND ("ss_sold_date_sk" = "d_date_sk")
    AND ("d_year" = 2001)
    AND (((("ss_hdemo_sk" = "hd_demo_sk")
        AND ("cd_demo_sk" = "ss_cdemo_sk")
        AND ("cd_marital_status" = 'M')
        AND ("cd_education_status" = 'Advanced Degree')
        AND ("ss_sales_price" BETWEEN DECIMAL '100.00' AND DECIMAL '150.00')
        AND ("hd_dep_count" = 3))

```

```

OR (("ss_hdemo_sk" = "hd_demo_sk")
    AND ("cd_demo_sk" = "ss_cdemo_sk")
    AND ("cd_marital_status" = 'S')
    AND ("cd_education_status" = 'College')
    AND ("ss_sales_price" BETWEEN DECIMAL '50.00' AND DECIMAL '100.00')
    AND ("hd_dep_count" = 1))
OR (("ss_hdemo_sk" = "hd_demo_sk")
    AND ("cd_demo_sk" = "ss_cdemo_sk")
    AND ("cd_marital_status" = 'W')
    AND ("cd_education_status" = '2 yr Degree')
    AND ("ss_sales_price" BETWEEN DECIMAL '150.00' AND DECIMAL '200.00')
    AND ("hd_dep_count" = 1)))
AND (((("ss_addr_sk" = "ca_address_sk")
    AND ("ca_country" = 'United States')
    AND ("ca_state" IN ('TX' , 'OH' , 'TX'))
    AND ("ss_net_profit" BETWEEN 100 AND 200))
    OR (("ss_addr_sk" = "ca_address_sk")
    AND ("ca_country" = 'United States')
    AND ("ca_state" IN ('OR' , 'NM' , 'KY'))
    AND ("ss_net_profit" BETWEEN 150 AND 300))
    OR (("ss_addr_sk" = "ca_address_sk")
    AND ("ca_country" = 'United States')
    AND ("ca_state" IN ('VA' , 'TX' , 'MS'))
    AND ("ss_net_profit" BETWEEN 50 AND 250))))

```

Traceback (most recent call last):

```

File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.py", line 955, in fetchone
    row = dbapi_cursor.fetchone()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 106, in fetchone
    self._fetch_while(lambda: not self._data and self._state != self._STATE_FINISHED)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 46, in _fetch_while
    self._fetch_more()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 308, in _fetch_more
    self._process_response(self._requests_session.get(self._nextUri, **self._requests_kwargs))
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 349, in _process_response

```

```
raise DatabaseError(response_json['error'])
pyhive.exc.DatabaseError: {'message': 'Query exceeded per-node user memory limit of 102.40MB [All
ocated: 101.85MB, Delta: 1.10MB, Top Consumers: {HashBuilderOperator=101.85MB, PartitionedOutputO
perator=3.90MB, ExchangeOperator=1.14MB}, Details: [{"taskId":"4.0.0","reservation":"93.58MB","to
pConsumers":[{"type":"HashBuilderOperator","planNodeId":"128","reservations":["6.14MB","6.14M
B","6.13MB","6.13MB","6.13MB","6.13MB","6.13MB","6.12MB","6.12MB","6.12MB","6.11MB","6.11MB","5.0
3MB","5.02MB","5.02MB","5.02MB"],"total":"93.58MB","info":"INNER;PARTITIONED;"}]},{taskId":"5.0.
0","reservation":"4.65MB","topConsumers":[{"type":"PartitionedOutputOperator","planNodeId":"106
3","reservations":["1.63MB","1.02MB","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0
B","0B","0B"],"total":"2.65MB"},{"type":"HashBuilderOperator","planNodeId":"136","reservations":
["128.40kB","128.40kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26k
B","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB"],"total":"2.00M
B","info":"INNER;PARTITIONED;"},{"type":"FilterAndProjectOperator","planNodeId":"1063","reservati
ons":["1.30kB","1.30kB","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B"],"t
otal":"2.59kB"}]},{taskId":"3.0.0","reservation":"2.21MB","topConsumers":[{"type":"HashBuilderOp
erator","planNodeId":"120","reservations":["142.04kB","142.01kB","141.91kB","141.91kB","141.87k
B","141.81kB","141.81kB","141.79kB","141.75kB","141.73kB","141.69kB","141.67kB","141.58kB","141.3
2kB","141.11kB","140.66kB"],"total":"2.21MB","info":"INNER;PARTITIONED;"}]}}]', 'errorCode': 1310
79, 'errorName': 'EXCEEDED_LOCAL_MEMORY_LIMIT', 'errorType': 'INSUFFICIENT_RESOURCES', 'boolean':
False, 'failureInfo': {'type': 'com.facebook.presto.ExceededMemoryLimitException', 'message': 'Qu
ery exceeded per-node user memory limit of 102.40MB [Allocated: 101.85MB, Delta: 1.10MB, Top Cons
umers: {HashBuilderOperator=101.85MB, PartitionedOutputOperator=3.90MB, ExchangeOperator=1.14MB},
Details: [{"taskId":"4.0.0","reservation":"93.58MB","topConsumers":[{"type":"HashBuilderOperato
r","planNodeId":"128","reservations":["6.14MB","6.14MB","6.13MB","6.13MB","6.13MB","6.13MB","6.13
MB","6.12MB","6.12MB","6.12MB","6.11MB","6.11MB","5.03MB","5.02MB","5.02MB","5.02MB"],"total":"9
3.58MB","info":"INNER;PARTITIONED;"}]},{taskId":"5.0.0","reservation":"4.65MB","topConsumers":
[{"type":"PartitionedOutputOperator","planNodeId":"1063","reservations":["1.63MB","1.02MB","0
B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B"],"total":"2.65MB"},{"type":"H
ashBuilderOperator","planNodeId":"136","reservations":["128.40kB","128.40kB","128.26kB","128.26k
B","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.2
6kB","128.26kB","128.26kB","128.26kB"],"total":"2.00MB","info":"INNER;PARTITIONED;"},{"type":"Fil
terAndProjectOperator","planNodeId":"1063","reservations":["1.30kB","1.30kB","0B","0B","0B","0
B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B"],"total":"2.59kB"}]},{taskId":"3.0.0","rese
rvation":"2.21MB","topConsumers":[{"type":"HashBuilderOperator","planNodeId":"120","reservation
s":["142.04kB","142.01kB","141.91kB","141.91kB","141.87kB","141.81kB","141.81kB","141.79kB","141.
75kB","141.73kB","141.69kB","141.67kB","141.58kB","141.32kB","141.11kB","140.66kB"],"total":"2.21
MB","info":"INNER;PARTITIONED;"}]}}]', 'suppressed': [], 'stack': ['com.facebook.presto.ExceededM
emoryLimitException.exceededLocalUserMemoryLimit(ExceededMemoryLimitException.java:49)', 'com.fac
ebook.presto.memory.QueryContext.enforceUserMemoryLimit(QueryContext.java:496)', 'com.facebook.pr
esto.memory.QueryContext.updateUserMemory(QueryContext.java:192)', 'com.facebook.presto.memory.Qu
eryContext$QueryMemoryReservationHandler.reserveMemory(QueryContext.java:462)', 'com.facebook.pre
sto.memory.context.RootAggregatedMemoryContext.updateBytes(RootAggregatedMemoryContext.java:37)',
'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemor
```

```
yContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes
(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemor
yContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.
ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.pr
esto.memory.context.SimpleLocalMemoryContext.setBytes(SimpleLocalMemoryContext.java:82)', 'com.fa
cebook.presto.operator.OperatorContext$InternalLocalMemoryContext.setBytes(OperatorContext.java:6
72)', 'com.facebook.presto.operator.HashBuilderOperator.finishInput(HashBuilderOperator.java:50
3)', 'com.facebook.presto.operator.HashBuilderOperator.finish(HashBuilderOperator.java:454)', 'co
m.facebook.presto.operator.Driver.processInternal(Driver.java:441)', 'com.facebook.presto.operato
r.Driver.lambda$processFor$9(Driver.java:301)', 'com.facebook.presto.operator.Driver.tryWithLock
(Driver.java:722)', 'com.facebook.presto.operator.Driver.processFor(Driver.java:294)', 'com.faceb
ook.presto.execution.SqlTaskExecution$DriverSplitRunner.processFor(SqlTaskExecution.java:1077)',
'com.facebook.presto.execution.executor.PrioritizedSplitRunner.process(PrioritizedSplitRunner.jav
a:162)', 'com.facebook.presto.execution.executor.TaskExecutor$TaskRunner.run(TaskExecutor.java:59
9)', 'com.facebook.presto.$gen.Presto_0_263_b9fd4d4____20211010_164639_1.run(Unknown Source)', 'j
ava.base/java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1128)', 'java.
base/java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:628)', 'java.bas
e/java.lang.Thread.run(Thread.java:829)' ]}}
```

The above exception was the direct cause of the following exception:

Traceback (most recent call last):

```
File "/tmp/ipykernel_394536/722970930.py", line 15, in <module>
    for row in rs:
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/result.p
y", line 381, in iterrows
    for row in self._fetchiter_impl():
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.p
y", line 1788, in _fetchiter_impl
    row = fetchone(self, self.cursor)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.p
y", line 960, in fetchone
    self.handle_exception(result, dbapi_cursor, e)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.p
y", line 941, in handle_exception
    result.connection._handle_dbapi_exception(
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py",
line 2023, in _handle_dbapi_exception
    util.raise_(
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/util/compat.py",
line 207, in raise_
    raise exception
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.p
```

```

y", line 955, in fetchone
    row = dbapi_cursor.fetchone()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 10
6, in fetchone
    self._fetch_while(lambda: not self._data and self._state != self._STATE_FINISHED)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 46,
in _fetch_while
    self._fetch_more()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 30
8, in _fetch_more
    self._process_response(self._requests_session.get(self._nextUri, **self._requests_kwargs))
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 34
9, in _process_response
    raise DatabaseError(response_json['error'])
sqlalchemy.exc.DatabaseError: (pyhive.exc.DatabaseError) {'message': 'Query exceeded per-node use
r memory limit of 102.40MB [Allocated: 101.85MB, Delta: 1.10MB, Top Consumers: {HashBuilderOperat
or=101.85MB, PartitionedOutputOperator=3.90MB, ExchangeOperator=1.14MB}, Details: [{"taskId":"4.
0.0","reservation":"93.58MB","topConsumers":[{"type":"HashBuilderOperator","planNodeId":"128","re
servations":["6.14MB","6.14MB","6.13MB","6.13MB","6.13MB","6.13MB","6.13MB","6.12MB","6.12MB","6.
12MB","6.11MB","6.11MB","5.03MB","5.02MB","5.02MB","5.02MB"],"total":"93.58MB","info":"INNER;PART
ITIONED;"}]},{ "taskId":"5.0.0","reservation":"4.65MB","topConsumers":[{"type":"PartitionedOutputO
perator","planNodeId":"1063","reservations":["1.63MB","1.02MB","0B","0B","0B","0B","0B","0B","0
B","0B","0B","0B","0B","0B","0B","0B"],"total":"2.65MB"}],{"type":"HashBuilderOperator","planNodeI
d":"136","reservations":["128.40kB","128.40kB","128.26kB","128.26kB","128.26kB","128.26kB","128.2
6kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","12
8.26kB"],"total":"2.00MB","info":"INNER;PARTITIONED;"}],{"type":"FilterAndProjectOperator","planNo
deId":"1063","reservations":["1.30kB","1.30kB","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0
B","0B","0B","0B","0B"],"total":"2.59kB"}]},{ "taskId":"3.0.0","reservation":"2.21MB","topConsumer
s":[{"type":"HashBuilderOperator","planNodeId":"120","reservations":["142.04kB","142.01kB","141.9
1kB","141.91kB","141.87kB","141.81kB","141.81kB","141.79kB","141.75kB","141.73kB","141.69kB","14
1.67kB","141.58kB","141.32kB","141.11kB","140.66kB"],"total":"2.21MB","info":"INNER;PARTITIONE
D;"}]}}]', 'errorCode': 131079, 'errorName': 'EXCEEDED_LOCAL_MEMORY_LIMIT', 'errorType': 'INSUFFI
CIENT_RESOURCES', 'boolean': False, 'failureInfo': {'type': 'com.facebook.presto.ExceededMemoryLi
mitException', 'message': 'Query exceeded per-node user memory limit of 102.40MB [Allocated: 101.
85MB, Delta: 1.10MB, Top Consumers: {HashBuilderOperator=101.85MB, PartitionedOutputOperator=3.90
MB, ExchangeOperator=1.14MB}, Details: [{"taskId":"4.0.0","reservation":"93.58MB","topConsumers":
[{"type":"HashBuilderOperator","planNodeId":"128","reservations":["6.14MB","6.14MB","6.13MB","6.1
3MB","6.13MB","6.13MB","6.13MB","6.12MB","6.12MB","6.12MB","6.11MB","6.11MB","5.03MB","5.02M
B","5.02MB","5.02MB"],"total":"93.58MB","info":"INNER;PARTITIONED;"}]},{ "taskId":"5.0.0","reserva
tion":"4.65MB","topConsumers":[{"type":"PartitionedOutputOperator","planNodeId":"1063","reservati
ons":["1.63MB","1.02MB","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B"],"t
otal":"2.65MB"}],{"type":"HashBuilderOperator","planNodeId":"136","reservations":["128.40kB","128.
40kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","12

```

```

8.26kB", "128.26kB", "128.26kB", "128.26kB", "128.26kB", "128.26kB"], "total": "2.00MB", "info": "INNER;PARTITIONED;"}, {"type": "FilterAndProjectOperator", "planNodeId": "1063", "reservations": [{"1.30kB", "1.30kB", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B"}, {"total": "2.59kB"}]}, {"taskId": "3.0.0", "reservation": "2.21MB", "topConsumers": [{"type": "HashBuilderOperator", "planNodeId": "120", "reservations": [{"142.04kB", "142.01kB", "141.91kB", "141.91kB", "141.87kB", "141.81kB", "141.81kB", "141.79kB", "141.75kB", "141.73kB", "141.69kB", "141.67kB", "141.58kB", "141.32kB", "141.11kB", "140.66kB"}], "total": "2.21MB", "info": "INNER;PARTITIONED;"}]}]}], 'suppressed': [], 'stack': ['com.facebook.presto.ExceededMemoryLimitException.exceededLocalUserMemoryLimit(ExceededMemoryLimitException.java:49)', 'com.facebook.presto.memory.QueryContext.enforceUserMemoryLimit(QueryContext.java:496)', 'com.facebook.presto.memory.QueryContext.updateUserMemory(QueryContext.java:192)', 'com.facebook.presto.memory.QueryContext$QueryMemoryReservationHandler.reserveMemory(QueryContext.java:462)', 'com.facebook.presto.memory.context.RootAggregatedMemoryContext.updateBytes(RootAggregatedMemoryContext.java:37)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.SimpleLocalMemoryContext.setBytes(SimpleLocalMemoryContext.java:82)', 'com.facebook.presto.operator.OperatorContext$InternalLocalMemoryContext.setBytes(OperatorContext.java:672)', 'com.facebook.presto.operator.HashBuilderOperator.finishInput(HashBuilderOperator.java:503)', 'com.facebook.presto.operator.HashBuilderOperator.finish(HashBuilderOperator.java:454)', 'com.facebook.presto.operator.Driver.processInternal(Driver.java:441)', 'com.facebook.presto.operator.Driver.lambda$processFor$9(Driver.java:301)', 'com.facebook.presto.operator.Driver.tryWithLock(Driver.java:722)', 'com.facebook.presto.operator.Driver.processFor(Driver.java:294)', 'com.facebook.presto.execution.SqlTaskExecution$DriverSplitRunner.processFor(SqlTaskExecution.java:1077)', 'com.facebook.presto.execution.executor.PrioritizedSplitRunner.process(PrioritizedSplitRunner.java:162)', 'com.facebook.presto.execution.executor.TaskExecutor$TaskRunner.run(TaskExecutor.java:599)', 'com.facebook.presto.$gen.Presto_0_263_b9fd4d4_20211010_164639_1.run(Unknown Source)', 'java.base/java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1128)', 'java.base/java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:628)', 'java.base/java.lang.Thread.run(Thread.java:829)']}]}
(Background on this error at: https://sqlalche.me/e/14/4xp6) (https://sqlalche.me/e/14/4xp6)

```

SQL name: ./benchmark/tpcds/q14_1.sql...

WITH

```

    cross_items AS (
        SELECT "i_item_sk" "ss_item_sk"
        FROM
            tpcds.tiny.item
        , (

```

```

SELECT
    "iss"."i_brand_id" "brand_id"
  , "iss"."i_class_id" "class_id"
  , "iss"."i_category_id" "category_id"
FROM
    tpcds.tiny.store_sales
  , tpcds.tiny.item iss
  , tpcds.tiny.date_dim d1
WHERE ("ss_item_sk" = "iss"."i_item_sk")
      AND ("ss_sold_date_sk" = "d1"."d_date_sk")
      AND ("d1"."d_year" BETWEEN 1999 AND (1999 + 2))
INTERSECT
    SELECT
        "ics"."i_brand_id"
      , "ics"."i_class_id"
      , "ics"."i_category_id"
    FROM
        tpcds.tiny.catalog_sales
      , tpcds.tiny.item ics
      , tpcds.tiny.date_dim d2
    WHERE ("cs_item_sk" = "ics"."i_item_sk")
          AND ("cs_sold_date_sk" = "d2"."d_date_sk")
          AND ("d2"."d_year" BETWEEN 1999 AND (1999 + 2))
INTERSECT
    SELECT
        "iws"."i_brand_id"
      , "iws"."i_class_id"
      , "iws"."i_category_id"
    FROM
        tpcds.tiny.web_sales
      , tpcds.tiny.item iws
      , tpcds.tiny.date_dim d3
    WHERE ("ws_item_sk" = "iws"."i_item_sk")
          AND ("ws_sold_date_sk" = "d3"."d_date_sk")
          AND ("d3"."d_year" BETWEEN 1999 AND (1999 + 2))
)
WHERE ("i_brand_id" = "brand_id")
      AND ("i_class_id" = "class_id")
      AND ("i_category_id" = "category_id")
)
, avg_sales AS (
    SELECT "avg" (("quantity" * "list_price")) "average_sales"
    FROM
        (
            SELECT

```

```

        "ss_quantity" "quantity"
      , "ss_list_price" "list_price"
    FROM
      tpcds.tiny.store_sales
    , tpcds.tiny.date_dim
    WHERE ("ss_sold_date_sk" = "d_date_sk")
      AND ("d_year" BETWEEN 1999 AND (1999 + 2))
UNION ALL
      SELECT
        "cs_quantity" "quantity"
      , "cs_list_price" "list_price"
    FROM
      tpcds.tiny.catalog_sales
    , tpcds.tiny.date_dim
    WHERE ("cs_sold_date_sk" = "d_date_sk")
      AND ("d_year" BETWEEN 1999 AND (1999 + 2))
UNION ALL
      SELECT
        "ws_quantity" "quantity"
      , "ws_list_price" "list_price"
    FROM
      tpcds.tiny.web_sales
    , tpcds.tiny.date_dim
    WHERE ("ws_sold_date_sk" = "d_date_sk")
      AND ("d_year" BETWEEN 1999 AND (1999 + 2))
  ) x
)
SELECT
  "channel"
, "i_brand_id"
, "i_class_id"
, "i_category_id"
, "sum"("sales")
, "sum"("number_sales")
FROM
  (
    SELECT
      'tpcds.tiny.store' "channel"
    , "i_brand_id"
    , "i_class_id"
    , "i_category_id"
    , "sum"(("ss_quantity" * "ss_list_price")) "sales"
    , "count"(*) "number_sales"
    FROM
      tpcds.tiny.store_sales

```



```

, tpcds.tiny.item
, tpcds.tiny.date_dim
WHERE ("ss_item_sk" IN (
    SELECT "ss_item_sk"
    FROM
        cross_items
))
AND ("ss_item_sk" = "i_item_sk")
AND ("ss_sold_date_sk" = "d_date_sk")
AND ("d_year" = (1999 + 2))
AND ("d_moy" = 11)
GROUP BY "i_brand_id", "i_class_id", "i_category_id"
HAVING ("sum"("ss_quantity" * "ss_list_price")) > (
    SELECT "average_sales"
    FROM
        avg_sales
))
UNION ALL    SELECT
'catalog' "channel"
, "i_brand_id"
, "i_class_id"
, "i_category_id"
, "sum"("cs_quantity" * "cs_list_price") "sales"
, "count"(*) "number_sales"
FROM
    tpcds.tiny.catalog_sales
, tpcds.tiny.item
, tpcds.tiny.date_dim
WHERE ("cs_item_sk" IN (
    SELECT "ss_item_sk"
    FROM
        cross_items
))
AND ("cs_item_sk" = "i_item_sk")
AND ("cs_sold_date_sk" = "d_date_sk")
AND ("d_year" = (1999 + 2))
AND ("d_moy" = 11)
GROUP BY "i_brand_id", "i_class_id", "i_category_id"
HAVING ("sum"("cs_quantity" * "cs_list_price")) > (
    SELECT "average_sales"
    FROM
        avg_sales
))

```

```

UNION ALL    SELECT
    'web' "channel"
    , "i_brand_id"
    , "i_class_id"
    , "i_category_id"
    , "sum"(("ws_quantity" * "ws_list_price")) "sales"
    , "count"(*) "number_sales"
FROM
    tpcds.tiny.web_sales
    , tpcds.tiny.item
    , tpcds.tiny.date_dim
WHERE ("ws_item_sk" IN (
    SELECT "ss_item_sk"
    FROM
        cross_items
    ))
    AND ("ws_item_sk" = "i_item_sk")
    AND ("ws_sold_date_sk" = "d_date_sk")
    AND ("d_year" = (1999 + 2))
    AND ("d_moy" = 11)
GROUP BY "i_brand_id", "i_class_id", "i_category_id"
HAVING ("sum"(("ws_quantity" * "ws_list_price")) > (
    SELECT "average_sales"
    FROM
        avg_sales
    ))
) y
GROUP BY ROLLUP (channel, i_brand_id, i_class_id, i_category_id)
ORDER BY "channel" ASC, "i_brand_id" ASC, "i_class_id" ASC, "i_category_id" ASC
LIMIT 100

```

Traceback (most recent call last):

```

File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py", line 1815, in _execute_context
    result = context._setup_result_proxy()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/default.py", line 1409, in _setup_result_proxy
    result = self._setup_dml_or_text_result()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/default.py", line 1491, in _setup_dml_or_text_result

```

```

        strategy.alternate_cursor_description or self.cursor.description
    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 225,
in description
        self._fetch_while(
    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 46, i
n _fetch_while
        self._fetch_more()
    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 308,
in _fetch_more
        self._process_response(self._requests_session.get(self._nextUri, **self._requests_kwargs))
    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 349,
in _process_response
        raise DatabaseError(response_json['error'])
pyhive.exc.DatabaseError: {'message': "Number of stages in the query (102) exceeds the allowed maxi
mum (100). If the query contains multiple DISTINCTs, please set the 'use_mark_distinct' session pro
perty to false. If the query contains multiple CTEs that are referenced more than once, please crea
te temporary table(s) for one or more of the CTEs.", 'errorCode': 40, 'errorName': 'QUERY_HAS_TOO_M
ANY_STAGES', 'errorType': 'USER_ERROR', 'boolean': False, 'failureInfo': {'type': 'com.facebook.pre
sto.spi.PrestoException', 'message': "Number of stages in the query (102) exceeds the allowed maxim
um (100). If the query contains multiple DISTINCTs, please set the 'use_mark_distinct' session prop
erty to false. If the query contains multiple CTEs that are referenced more than once, please creat
e temporary table(s) for one or more of the CTEs.", 'suppressed': [], 'stack': ['com.facebook.prest
o.sql.planner.PlanFragmenter.sanityCheckFragmentedPlan(PlanFragmenter.java:226)', 'com.facebook.pre
sto.sql.planner.PlanFragmenter.createSubPlans(PlanFragmenter.java:205)', 'com.facebook.presto.execu
tion.SqlQueryExecution.doAnalyzeQuery(SqlQueryExecution.java:455)', 'com.facebook.presto.execution.
SqlQueryExecution.analyzeQuery(SqlQueryExecution.java:427)', 'com.facebook.presto.execution.SqlQuer
yExecution.start(SqlQueryExecution.java:363)', 'com.facebook.presto.$gen.Presto_0_263_b9fd4d4____20
211010_164639_1.run(Unknown Source)', 'com.facebook.presto.execution.SqlQueryManager.createQuery(Sq
lQueryManager.java:266)', 'com.facebook.presto.dispatcher.LocalDispatchQuery.lambda$startExecution
$7(LocalDispatchQuery.java:192)', 'java.base/java.util.concurrent.ThreadPoolExecutor.runWorker(Thre
adPoolExecutor.java:1128)', 'java.base/java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoo
lExecutor.java:628)', 'java.base/java.lang.Thread.run(Thread.java:829)']}

```

The above exception was the direct cause of the following exception:

```

Traceback (most recent call last):
  File "/tmp/ipykernel_394536/722970930.py", line 13, in <module>
    rs = conn.execute(sql)
  File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py", l
ine 1271, in execute
    return self._exec_driver_sql(
  File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py", l
ine 1575, in _exec_driver_sql

```

```

        ret = self._execute_context(
            File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py", l
ine 1842, in _execute_context
                self._handle_dbapi_exception(
                    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py", l
ine 2023, in _handle_dbapi_exception
                        util.raise_(
                            File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/util/compat.py", l
ine 207, in raise_
                                raise exception
                                    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py", l
ine 1815, in _execute_context
                                        result = context._setup_result_proxy()
                                            File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/default.p
y", line 1409, in _setup_result_proxy
                                                result = self._setup_dml_or_text_result()
                                                    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/default.p
y", line 1491, in _setup_dml_or_text_result
                                                        strategy.alternate_cursor_description or self.cursor.description
                                                            File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 225,
in description
                                                                self._fetch_while(
                                                                    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 46, i
n _fetch_while
                                                                        self._fetch_more()
                                                                            File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 308,
in _fetch_more
                                                                                self._process_response(self._requests_session.get(self._nextUri, **self._requests_kwargs))
                                                                                    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 349,
in _process_response
                                                                                        raise DatabaseError(response_json['error'])
sqlalchemy.exc.DatabaseError: (pyhive.exc.DatabaseError) {'message': "Number of stages in the query
(102) exceeds the allowed maximum (100). If the query contains multiple DISTINCTs, please set the
'use_mark_distinct' session property to false. If the query contains multiple CTEs that are referen
ced more than once, please create temporary table(s) for one or more of the CTEs.", 'errorCode': 4
0, 'errorName': 'QUERY_HAS_TOO_MANY_STAGES', 'errorType': 'USER_ERROR', 'boolean': False, 'failureI
nfo': {'type': 'com.facebook.presto.spi.PrestoException', 'message': "Number of stages in the query
(102) exceeds the allowed maximum (100). If the query contains multiple DISTINCTs, please set the
'use_mark_distinct' session property to false. If the query contains multiple CTEs that are referen
ced more than once, please create temporary table(s) for one or more of the CTEs.", 'suppressed':
[], 'stack': ['com.facebook.presto.sql.planner.PlanFragmenter.sanityCheckFragmentedPlan(PlanFragment
ter.java:226)', 'com.facebook.presto.sql.planner.PlanFragmenter.createSubPlans(PlanFragmenter.java:
205)', 'com.facebook.presto.execution.SqlQueryExecution.doAnalyzeQuery(SqlQueryExecution.java:45

```

```
5)', 'com.facebook.presto.execution.SqlQueryExecution.analyzeQuery(SqlQueryExecution.java:427)', 'com.facebook.presto.execution.SqlQueryExecution.start(SqlQueryExecution.java:363)', 'com.facebook.presto.$gen.Presto_0_263_b9fd4d4_20211010_164639_1.run(Unknown Source)', 'com.facebook.presto.execution.SqlQueryManager.createQuery(SqlQueryManager.java:266)', 'com.facebook.presto.dispatcher.LocalDispatchQuery.lambda$startExecution$7(LocalDispatchQuery.java:192)', 'java.base/java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1128)', 'java.base/java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:628)', 'java.base/java.lang.Thread.run(Thread.java:829)']}}}
```

```
[SQL: WITH
```

```
  cross_items AS (
    SELECT "i_item_sk" "ss_item_sk"
    FROM
      tpcds.tiny.item
    , (
      SELECT
        "iss"."i_brand_id" "brand_id"
      , "iss"."i_class_id" "class_id"
      , "iss"."i_category_id" "category_id"
      FROM
        tpcds.tiny.store_sales
      , tpcds.tiny.item iss
      , tpcds.tiny.date_dim d1
      WHERE ("ss_item_sk" = "iss"."i_item_sk")
        AND ("ss_sold_date_sk" = "d1"."d_date_sk")
        AND ("d1"."d_year" BETWEEN 1999 AND (1999 + 2))
```

```
INTERSECT      SELECT
      "ics"."i_brand_id"
    , "ics"."i_class_id"
    , "ics"."i_category_id"
    FROM
      tpcds.tiny.catalog_sales
    , tpcds.tiny.item ics
    , tpcds.tiny.date_dim d2
    WHERE ("cs_item_sk" = "ics"."i_item_sk")
      AND ("cs_sold_date_sk" = "d2"."d_date_sk")
      AND ("d2"."d_year" BETWEEN 1999 AND (1999 + 2))
```

```
INTERSECT      SELECT
      "iws"."i_brand_id"
    , "iws"."i_class_id"
    , "iws"."i_category_id"
    FROM
      tpcds.tiny.web_sales
    , tpcds.tiny.item iws
```

```

        , tpcds.tiny.date_dim d3
        WHERE ("ws_item_sk" = "iws"."i_item_sk")
            AND ("ws_sold_date_sk" = "d3"."d_date_sk")
            AND ("d3"."d_year" BETWEEN 1999 AND (1999 + 2))
    )
    WHERE ("i_brand_id" = "brand_id")
        AND ("i_class_id" = "class_id")
        AND ("i_category_id" = "category_id")
)
, avg_sales AS (
    SELECT "avg"(("quantity" * "list_price")) "average_sales"
    FROM
        (
            SELECT
                "ss_quantity" "quantity"
            , "ss_list_price" "list_price"
            FROM
                tpcds.tiny.store_sales
            , tpcds.tiny.date_dim
            WHERE ("ss_sold_date_sk" = "d_date_sk")
                AND ("d_year" BETWEEN 1999 AND (1999 + 2))
        UNION ALL
            SELECT
                "cs_quantity" "quantity"
            , "cs_list_price" "list_price"
            FROM
                tpcds.tiny.catalog_sales
            , tpcds.tiny.date_dim
            WHERE ("cs_sold_date_sk" = "d_date_sk")
                AND ("d_year" BETWEEN 1999 AND (1999 + 2))
        UNION ALL
            SELECT
                "ws_quantity" "quantity"
            , "ws_list_price" "list_price"
            FROM
                tpcds.tiny.web_sales
            , tpcds.tiny.date_dim
            WHERE ("ws_sold_date_sk" = "d_date_sk")
                AND ("d_year" BETWEEN 1999 AND (1999 + 2))
        ) x
)
SELECT
    "channel"
, "i_brand_id"
, "i_class_id"

```

```

, "i_category_id"
, "sum"("sales")
, "sum"("number_sales")
FROM
(
  SELECT
    'tpcds.tiny.store' "channel"
    , "i_brand_id"
    , "i_class_id"
    , "i_category_id"
    , "sum"("ss_quantity" * "ss_list_price")) "sales"
    , "count"(*) "number_sales"
  FROM
    tpcds.tiny.store_sales
    , tpcds.tiny.item
    , tpcds.tiny.date_dim
  WHERE ("ss_item_sk" IN (
    SELECT "ss_item_sk"
    FROM
      cross_items
  ))
    AND ("ss_item_sk" = "i_item_sk")
    AND ("ss_sold_date_sk" = "d_date_sk")
    AND ("d_year" = (1999 + 2))
    AND ("d_moy" = 11)
  GROUP BY "i_brand_id", "i_class_id", "i_category_id"
  HAVING ("sum"("ss_quantity" * "ss_list_price")) > (
    SELECT "average_sales"
    FROM
      avg_sales
  ))
UNION ALL
  SELECT
    'catalog' "channel"
    , "i_brand_id"
    , "i_class_id"
    , "i_category_id"
    , "sum"("cs_quantity" * "cs_list_price")) "sales"
    , "count"(*) "number_sales"
  FROM
    tpcds.tiny.catalog_sales
    , tpcds.tiny.item
    , tpcds.tiny.date_dim
  WHERE ("cs_item_sk" IN (

```

```

        SELECT "ss_item_sk"
        FROM
            cross_items
    ))
    AND ("cs_item_sk" = "i_item_sk")
    AND ("cs_sold_date_sk" = "d_date_sk")
    AND ("d_year" = (1999 + 2))
    AND ("d_moy" = 11)
GROUP BY "i_brand_id", "i_class_id", "i_category_id"
HAVING ("sum"(("cs_quantity" * "cs_list_price")) > (
    SELECT "average_sales"
    FROM
        avg_sales
))
UNION ALL    SELECT
    'web' "channel"
    , "i_brand_id"
    , "i_class_id"
    , "i_category_id"
    , "sum"(("ws_quantity" * "ws_list_price")) "sales"
    , "count"(*) "number_sales"
FROM
    tpcds.tiny.web_sales
    , tpcds.tiny.item
    , tpcds.tiny.date_dim
WHERE ("ws_item_sk" IN (
    SELECT "ss_item_sk"
    FROM
        cross_items
))
    AND ("ws_item_sk" = "i_item_sk")
    AND ("ws_sold_date_sk" = "d_date_sk")
    AND ("d_year" = (1999 + 2))
    AND ("d_moy" = 11)
GROUP BY "i_brand_id", "i_class_id", "i_category_id"
HAVING ("sum"(("ws_quantity" * "ws_list_price")) > (
    SELECT "average_sales"
    FROM
        avg_sales
))
) y
GROUP BY ROLLUP (channel, i_brand_id, i_class_id, i_category_id)
ORDER BY "channel" ASC, "i_brand_id" ASC, "i_class_id" ASC, "i_category_id" ASC

```


LIMIT 100

]

(Background on this error at: <https://sqlalche.me/e/14/4xp6>) (<https://sqlalche.me/e/14/4xp6>)

SQL name: ./benchmark/tpcds/q14_2.sql...

=====

WITH

cross_items AS (

SELECT "i_item_sk" "ss_item_sk"

FROM

tpcds.tiny.item

, (

SELECT

"iss"."i_brand_id" "brand_id"

, "iss"."i_class_id" "class_id"

, "iss"."i_category_id" "category_id"

FROM

tpcds.tiny.store_sales

, tpcds.tiny.item iss

, tpcds.tiny.date_dim d1

WHERE ("ss_item_sk" = "iss"."i_item_sk")

AND ("ss_sold_date_sk" = "d1"."d_date_sk")

AND ("d1"."d_year" BETWEEN 1999 AND (1999 + 2))

INTERSECT SELECT

"ics"."i_brand_id"

, "ics"."i_class_id"

, "ics"."i_category_id"

FROM

tpcds.tiny.catalog_sales

, tpcds.tiny.item ics

, tpcds.tiny.date_dim d2

WHERE ("cs_item_sk" = "ics"."i_item_sk")

AND ("cs_sold_date_sk" = "d2"."d_date_sk")

AND ("d2"."d_year" BETWEEN 1999 AND (1999 + 2))

INTERSECT SELECT

"iws"."i_brand_id"

, "iws"."i_class_id"

, "iws"."i_category_id"

FROM

tpcds.tiny.web_sales

, tpcds.tiny.item iws

```

        , tpcds.tiny.date_dim d3
        WHERE ("ws_item_sk" = "iws"."i_item_sk")
            AND ("ws_sold_date_sk" = "d3"."d_date_sk")
            AND ("d3"."d_year" BETWEEN 1999 AND (1999 + 2))
    ) x
    WHERE ("i_brand_id" = "brand_id")
        AND ("i_class_id" = "class_id")
        AND ("i_category_id" = "category_id")
)
, avg_sales AS (
    SELECT "avg"(("quantity" * "list_price")) "average_sales"
    FROM
        (
            SELECT
                "ss_quantity" "quantity"
            , "ss_list_price" "list_price"
            FROM
                tpcds.tiny.store_sales
            , tpcds.tiny.date_dim
            WHERE ("ss_sold_date_sk" = "d_date_sk")
                AND ("d_year" BETWEEN 1999 AND (1999 + 2))
        UNION ALL
            SELECT
                "cs_quantity" "quantity"
            , "cs_list_price" "list_price"
            FROM
                tpcds.tiny.catalog_sales
            , tpcds.tiny.date_dim
            WHERE ("cs_sold_date_sk" = "d_date_sk")
                AND ("d_year" BETWEEN 1999 AND (1999 + 2))
        UNION ALL
            SELECT
                "ws_quantity" "quantity"
            , "ws_list_price" "list_price"
            FROM
                tpcds.tiny.web_sales
            , tpcds.tiny.date_dim
            WHERE ("ws_sold_date_sk" = "d_date_sk")
                AND ("d_year" BETWEEN 1999 AND (1999 + 2))
        )
)
SELECT *
FROM
    (
        SELECT

```

```

        'tpcds.tiny.store' "channel"
    , "i_brand_id"
    , "i_class_id"
    , "i_category_id"
    , "sum"(("ss_quantity" * "ss_list_price")) "sales"
    , "count"(*) "number_sales"
FROM
    tpcds.tiny.store_sales
    , tpcds.tiny.item
    , tpcds.tiny.date_dim
WHERE ("ss_item_sk" IN (
    SELECT "ss_item_sk"
    FROM
        cross_items
    ))
    AND ("ss_item_sk" = "i_item_sk")
    AND ("ss_sold_date_sk" = "d_date_sk")
    AND ("d_week_seq" = (
        SELECT "d_week_seq"
        FROM
            tpcds.tiny.date_dim
        WHERE ("d_year" = (1999 + 1))
            AND ("d_moy" = 12)
            AND ("d_dom" = 11)
        ))
GROUP BY "i_brand_id", "i_class_id", "i_category_id"
HAVING ("sum"(("ss_quantity" * "ss_list_price")) > (
    SELECT "average_sales"
    FROM
        avg_sales
    ))
) this_year
, (
    SELECT
        'tpcds.tiny.store' "channel"
    , "i_brand_id"
    , "i_class_id"
    , "i_category_id"
    , "sum"(("ss_quantity" * "ss_list_price")) "sales"
    , "count"(*) "number_sales"
FROM
    tpcds.tiny.store_sales
    , tpcds.tiny.item

```

```

, tpcds.tiny.date_dim
WHERE ("ss_item_sk" IN (
    SELECT "ss_item_sk"
    FROM
        cross_items
))
AND ("ss_item_sk" = "i_item_sk")
AND ("ss_sold_date_sk" = "d_date_sk")
AND ("d_week_seq" = (
    SELECT "d_week_seq"
    FROM
        tpcds.tiny.date_dim
    WHERE ("d_year" = 1999)
        AND ("d_moy" = 12)
        AND ("d_dom" = 11)
))
GROUP BY "i_brand_id", "i_class_id", "i_category_id"
HAVING ("sum"((("ss_quantity" * "ss_list_price")) > (
    SELECT "average_sales"
    FROM
        avg_sales
))
) last_year
WHERE ("this_year"."i_brand_id" = "last_year"."i_brand_id")
    AND ("this_year"."i_class_id" = "last_year"."i_class_id")
    AND ("this_year"."i_category_id" = "last_year"."i_category_id")
ORDER BY "this_year"."channel" ASC, "this_year"."i_brand_id" ASC, "this_year"."i_class_id" ASC, "this_year"."i_category_id" ASC
LIMIT 100

```

Results: completed in 2 sec

+++++

```

[('tpcds.tiny.store', 1001001, 1, 1, '21153.40', 6, 'tpcds.tiny.store', 1001001, 1, 1, '66330.36',
21), ('tpcds.tiny.store', 1001002, 1, 1, '51720.98', 9, 'tpcds.tiny.store', 1001002, 1, 1, '23645.9
8', 9), ('tpcds.tiny.store', 1002001, 2, 1, '21807.26', 7, 'tpcds.tiny.store', 1002001, 2, 1, '7282
0.44', 17), ('tpcds.tiny.store', 1002002, 2, 1, '77160.97', 24, 'tpcds.tiny.store', 1002002, 2, 1,
'43957.64', 11), ('tpcds.tiny.store', 1003001, 3, 1, '12908.23', 5, 'tpcds.tiny.store', 1003001, 3,
1, '66030.07', 15)]

```

SQL name: ./benchmark/tpcds/q15.sql...

=====

```
SELECT
  "ca_zip"
, "sum"("cs_sales_price")
FROM
  tpcds.tiny.catalog_sales
, tpcds.tiny.customer
, tpcds.tiny.customer_address
, tpcds.tiny.date_dim
WHERE ("cs_bill_customer_sk" = "c_customer_sk")
  AND ("c_current_addr_sk" = "ca_address_sk")
  AND (("substr"("ca_zip", 1, 5) IN ('85669' , '86197' , '88274' , '83405' , '86475' ,
'85392' , '85460' , '80348' , '81792'))
  OR ("ca_state" IN ('CA' , 'WA' , 'GA'))
  OR ("cs_sales_price" > 500))
  AND ("cs_sold_date_sk" = "d_date_sk")
  AND ("d_qoy" = 2)
  AND ("d_year" = 2001)
GROUP BY "ca_zip"
ORDER BY "ca_zip" ASC
LIMIT 100
```

Results: completed in 2 sec

+++++

```
[('30059' , '581.35'), ('30399' , '1175.80'), ('30411' , '1307.33'), ('30534' , '24
4.73'), ('32293' , '731.64')]
```

SQL name: ./benchmark/tpcds/q16.sql...

=====

```
SELECT
  "count"(DISTINCT "cs_order_number") "order count"
, "sum"("cs_ext_ship_cost") "total shipping cost"
, "sum"("cs_net_profit") "total net profit"
FROM
  tpcds.tiny.catalog_sales cs1
, tpcds.tiny.date_dim
, tpcds.tiny.customer_address
, tpcds.tiny.call_center
WHERE ("d_date" BETWEEN CAST('2002-2-01' AS DATE) AND (CAST('2002-2-01' AS DATE) + INTERVAL '60' D
```

```

AY))
  AND ("cs1"."cs_ship_date_sk" = "d_date_sk")
  AND ("cs1"."cs_ship_addr_sk" = "ca_address_sk")
  AND ("ca_state" = 'GA')
  AND ("cs1"."cs_call_center_sk" = "cc_call_center_sk")
  AND ("cc_county" IN ('Williamson County', 'Williamson County', 'Williamson County', 'Williamson
County', 'Williamson County'))
  AND (EXISTS (
    SELECT *
    FROM
      tpcds.tiny.catalog_sales cs2
    WHERE ("cs1"."cs_order_number" = "cs2"."cs_order_number")
      AND ("cs1"."cs_warehouse_sk" <> "cs2"."cs_warehouse_sk")
  ))
  AND (NOT (EXISTS (
    SELECT *
    FROM
      tpcds.tiny.catalog_returns cr1
    WHERE ("cs1"."cs_order_number" = "cr1"."cr_order_number")
  )))
ORDER BY "count"(DISTINCT "cs_order_number") ASC
LIMIT 100

```

Results: completed in 2 sec
+++++
[(0, None, None)]

SQL name: ./benchmark/tpcds/q17.sql...

=====

```

SELECT
  "i_item_id"
, "i_item_desc"
, "s_state"
, "count"("ss_quantity") "store_sales_quantitycount"
, "avg"("ss_quantity") "store_sales_quantityave"
, "stddev_samp"("ss_quantity") "store_sales_quantitystdev"
, ("stddev_samp"("ss_quantity") / "avg"("ss_quantity")) "store_sales_quantitycov"
, "count"("sr_return_quantity") "store_returns_quantitycount"
, "avg"("sr_return_quantity") "store_returns_quantityave"
, "stddev_samp"("sr_return_quantity") "store_returns_quantitystdev"

```

```

, ("stddev_samp"("sr_return_quantity") / "avg"("sr_return_quantity")) "store_returns_quantitycov"
, "count"("cs_quantity") "catalog_sales_quantitycount"
, "avg"("cs_quantity") "catalog_sales_quantityave"
, "stddev_samp"("cs_quantity") "catalog_sales_quantitystdev"
, ("stddev_samp"("cs_quantity") / "avg"("cs_quantity")) "catalog_sales_quantitycov"
FROM
  tpcds.tiny.store_sales
, tpcds.tiny.store_returns
, tpcds.tiny.catalog_sales
, tpcds.tiny.date_dim d1
, tpcds.tiny.date_dim d2
, tpcds.tiny.date_dim d3
, tpcds.tiny.store
, tpcds.tiny.item
WHERE ("d1"."d_quarter_name" = '2001Q1')
  AND ("d1"."d_date_sk" = "ss_sold_date_sk")
  AND ("i_item_sk" = "ss_item_sk")
  AND ("s_store_sk" = "ss_store_sk")
  AND ("ss_customer_sk" = "sr_customer_sk")
  AND ("ss_item_sk" = "sr_item_sk")
  AND ("ss_ticket_number" = "sr_ticket_number")
  AND ("sr_returned_date_sk" = "d2"."d_date_sk")
  AND ("d2"."d_quarter_name" IN ('2001Q1', '2001Q2', '2001Q3'))
  AND ("sr_customer_sk" = "cs_bill_customer_sk")
  AND ("sr_item_sk" = "cs_item_sk")
  AND ("cs_sold_date_sk" = "d3"."d_date_sk")
  AND ("d3"."d_quarter_name" IN ('2001Q1', '2001Q2', '2001Q3'))
GROUP BY "i_item_id", "i_item_desc", "s_state"
ORDER BY "i_item_id" ASC, "i_item_desc" ASC, "s_state" ASC
LIMIT 100

```

Results: completed in 2 sec

+++++

[('AAAAAAAJDBAAAA', 'Schools check by a machines. Main units will involve hands. All large orders will not date so findings. Strongly brilliant roots reduce. Members bring behind a services. Surprisingly econom', 'TN', 1, 4.0, None, None, 1, 4.0, None, None, 1, 6.0, None, None), ('AAAAAAAJHDAAAA', 'Available, lucky groups spread entirely always similar societies; things shall not get at a hours. So closed birds can turn', 'TN', 1, 97.0, None, None, 1, 33.0, None, None, 1, 45.0, None, None), ('AAAAAAALEEAAAA', 'Terms cannot enc', 'TN', 1, 56.0, None, None, 1, 21.0, None, None, 1, 3.0, None, None), ('AAAAAAAOFDAAAA', 'Candidates will hold. Chief ages used to choose with the foundations; horrible, complex rates meet', 'TN', 1, 16.0, None, None, 1, 13.0, None, None, 1, 12.0, No

```
ne, None), ('AAAAAAA0IAAAAA', 'Desperately general missiles ought to know here other far talks. New times could exercise too young months. Unpleasant, likely countries explain.', 'TN', 1, 18.0, None, None, 1, 9.0, None, None, 1, 64.0, None, None)]
```

SQL name: ./benchmark/tpcds/q18.sql...

=====

```
SELECT
  "i_item_id"
, "ca_country"
, "ca_state"
, "ca_county"
, "avg"(CAST("cs_quantity" AS DECIMAL(12,2))) "agg1"
, "avg"(CAST("cs_list_price" AS DECIMAL(12,2))) "agg2"
, "avg"(CAST("cs_coupon_amt" AS DECIMAL(12,2))) "agg3"
, "avg"(CAST("cs_sales_price" AS DECIMAL(12,2))) "agg4"
, "avg"(CAST("cs_net_profit" AS DECIMAL(12,2))) "agg5"
, "avg"(CAST("c_birth_year" AS DECIMAL(12,2))) "agg6"
, "avg"(CAST("cd1"."cd_dep_count" AS DECIMAL(12,2))) "agg7"
FROM
  tpcds.tiny.catalog_sales
, tpcds.tiny.customer_demographics cd1
, tpcds.tiny.customer_demographics cd2
, tpcds.tiny.customer
, tpcds.tiny.customer_address
, tpcds.tiny.date_dim
, tpcds.tiny.item
WHERE ("cs_sold_date_sk" = "d_date_sk")
  AND ("cs_item_sk" = "i_item_sk")
  AND ("cs_bill_cdemo_sk" = "cd1"."cd_demo_sk")
  AND ("cs_bill_customer_sk" = "c_customer_sk")
  AND ("cd1"."cd_gender" = 'F')
  AND ("cd1"."cd_education_status" = 'Unknown')
  AND ("c_current_cdemo_sk" = "cd2"."cd_demo_sk")
  AND ("c_current_addr_sk" = "ca_address_sk")
  AND ("c_birth_month" IN (1, 6, 8, 9, 12, 2))
  AND ("d_year" = 1998)
  AND ("ca_state" IN ('MS', 'IN', 'ND', 'OK', 'NM', 'VA', 'MS'))
GROUP BY ROLLUP (i_item_id, ca_country, ca_state, ca_county)
ORDER BY "ca_country" ASC, "ca_state" ASC, "ca_county" ASC, "i_item_id" ASC
LIMIT 100
```


Results: completed in 2 sec

+++++

```
[('AAAAAAAAAFAAAAA', 'United States', 'IN', 'Jefferson County', '34.00', '54.81', '0.00', '51.52',
'72.76', '1935.00', '6.00'), ('AAAAAAAAACFAAAAA', 'United States', 'IN', 'Jefferson County', '84.0
0', '38.86', '849.89', '24.09', '11.95', '1935.00', '6.00'), ('AAAAAAAAEAAAAAA', 'United States',
'IN', 'Jefferson County', '53.00', '53.31', '0.00', '39.98', '1151.16', '1935.00', '2.00'), ('AAAAA
AAAAJHAAAAA', 'United States', 'IN', 'Jefferson County', '90.00', '25.65', '0.00', '13.33', '-15.3
0', '1935.00', '6.00'), ('AAAAAAAABAAAAAA', 'United States', 'IN', 'Jefferson County', '56.00', '1
31.95', '0.00', '55.41', '260.96', '1935.00', '2.00')]
```

SQL name: ./benchmark/tpcds/q19.sql...

=====

SELECT

```
    "i_brand_id" "brand_id"
,   "i_brand" "brand"
,   "i_manufact_id"
,   "i_manufact"
,   "sum"("ss_ext_sales_price") "ext_price"
```

FROM

```
    tpcds.tiny.date_dim
,   tpcds.tiny.store_sales
,   tpcds.tiny.item
,   tpcds.tiny.customer
,   tpcds.tiny.customer_address
,   tpcds.tiny.store
```

WHERE ("d_date_sk" = "ss_sold_date_sk")

AND ("ss_item_sk" = "i_item_sk")

AND ("i_manager_id" = 8)

AND ("d_moy" = 11)

AND ("d_year" = 1998)

AND ("ss_customer_sk" = "c_customer_sk")

AND ("c_current_addr_sk" = "ca_address_sk")

AND ("substr"("ca_zip", 1, 5) <> "substr"("s_zip", 1, 5))

AND ("ss_store_sk" = "s_store_sk")

GROUP BY "i_brand", "i_brand_id", "i_manufact_id", "i_manufact"

ORDER BY "ext_price" DESC, "i_brand" ASC, "i_brand_id" ASC, "i_manufact_id" ASC, "i_manufact" ASC

LIMIT 100

Results: completed in 2 sec

+++++

```
[(8003007, 'exportinameless #7', 85, 'antieing', 255, 'antiantiabl  
' , '15688.10'), (9005009, 'scholarmaxi #9', 277, 'ationationabl  
' , '13609.55'), (8012001, 'importomaxi #1', 277, 'ationationabl  
e', '11761.30'), (3001002, 'amalgexporti #2', 277, 'ationationabl  
' , 448, 'eingeseese', '10758.12'), (1002002, 'importoamalg  
#2', 50, 'baranti',  
'10446.47')]
```

SQL name: ./benchmark/tpcds/q20.sql...

=====

SELECT

```
    "i_item_id"  
  , "i_item_desc"  
  , "i_category"  
  , "i_class"  
  , "i_current_price"  
  , "sum"("cs_ext_sales_price") "tpcds.tiny.itemrevenue"  
  , (("sum"("cs_ext_sales_price") * 100) / "sum"("sum"("cs_ext_sales_price"))) OVER (PARTITION BY "i_c  
lass")) "revenueration"  
FROM  
    tpcds.tiny.catalog_sales  
  , tpcds.tiny.item  
  , tpcds.tiny.date_dim  
WHERE ("cs_item_sk" = "i_item_sk")  
    AND ("i_category" IN ('Sports', 'Books', 'Home'))  
    AND ("cs_sold_date_sk" = "d_date_sk")  
    AND (CAST("d_date" AS DATE) BETWEEN CAST('1999-02-22' AS DATE) AND (CAST('1999-02-22' AS DATE) +  
INTERVAL '30' DAY))  
GROUP BY "i_item_id", "i_item_desc", "i_category", "i_class", "i_current_price"  
ORDER BY "i_category" ASC, "i_class" ASC, "i_item_id" ASC, "i_item_desc" ASC, "revenueration" ASC  
LIMIT 100
```

Results: completed in 2 sec

+++++

```
[('AAAAAAACKKEAAAA', 'Legs appear eventually soci', 'Books  
' , 'arts', '35.27', '2797.92', '42.94'), ('AAAAAAAMF  
FAAAAA', 'Communities used to relocate clearly strange, new walls; european, rich championships mak  
e current depths. Sure studies may reflect only instinctively old forces. Foreign, diverse', 'Books
```

```

', 'arts', '8.22', '150.80', '2.31'), ('AAAAAAAANIBAA
AAA', 'Beneath decent wives write t', 'Books', 'arts
', '2.72', '3566.52', '54.74'), ('AAAAAAAADFAAAAA', 'Satisfactory, technical shadows get. Lexical
structures would not blame. Only hard ', 'Books', 'bus
iness', '78.25', '721.68', '6.94'), ('AAAAAAAEEICAAAAA',
'Cases include proudly without a columns. Solid, pre', 'Books
', 'business', '2.42', '1781.00', '17.13')]

```

SQL name: ./benchmark/tpcds/q21.sql...

=====

```

SELECT *
FROM
(
  SELECT
    "w_warehouse_name"
    , "i_item_id"
    , "sum"((CASE WHEN (CAST("d_date" AS DATE) < CAST('2000-03-11' AS DATE)) THEN "inv_quantity_on_h
and" ELSE 0 END)) "inv_before"
    , "sum"((CASE WHEN (CAST("d_date" AS DATE) >= CAST('2000-03-11' AS DATE)) THEN "inv_quantity_on_
hand" ELSE 0 END)) "inv_after"
  FROM
    tpcds.tiny.inventory
    , tpcds.tiny.warehouse
    , tpcds.tiny.item
    , tpcds.tiny.date_dim
  WHERE ("i_current_price" BETWEEN DECIMAL '0.99' AND DECIMAL '1.49')
    AND ("i_item_sk" = "inv_item_sk")
    AND ("inv_warehouse_sk" = "w_warehouse_sk")
    AND ("inv_date_sk" = "d_date_sk")
    AND ("d_date" BETWEEN (CAST('2000-03-11' AS DATE) - INTERVAL '30' DAY) AND (CAST('2000-03-1
1' AS DATE) + INTERVAL '30' DAY))
  GROUP BY "w_warehouse_name", "i_item_id"
) x
WHERE ((CASE WHEN ("inv_before" > 0) THEN (CAST("inv_after" AS DECIMAL(7,2)) / "inv_before") ELSE n
ull END) BETWEEN (DECIMAL '2.00' / DECIMAL '3.00') AND (DECIMAL '3.00' / DECIMAL '2.00'))
ORDER BY "w_warehouse_name" ASC, "i_item_id" ASC
LIMIT 100

```

Results: completed in 1 sec

+++++

```
[('Conventional childr', 'AAAAAAAAAHHAAAAA', 2366, 3097), ('Conventional childr', 'AAAAAAAAAJCAAAA
A', 2523, 1697), ('Conventional childr', 'AAAAAAAABKFAAAAA', 1798, 2127), ('Conventional childr',
'AAAAAAAACAAAAAAA', 1660, 1593), ('Conventional childr', 'AAAAAAAACBFAAAAA', 1794, 2661)]
```

SQL name: ./benchmark/tpcds/q22.sql...

=====

```
SELECT
  "i_product_name"
, "i_brand"
, "i_class"
, "i_category"
, "avg"("inv_quantity_on_hand") "qoh"
FROM
  tpcds.tiny.inventory
, tpcds.tiny.date_dim
, tpcds.tiny.item
WHERE ("inv_date_sk" = "d_date_sk")
  AND ("inv_item_sk" = "i_item_sk")
  AND ("d_month_seq" BETWEEN 1200 AND (1200 + 11))
GROUP BY ROLLUP (i_product_name, i_brand, i_class, i_category)
ORDER BY "qoh" ASC, "i_product_name" ASC, "i_brand" ASC, "i_class" ASC, "i_category" ASC
LIMIT 100
```

Results: completed in 1 sec

+++++

```
[('n stcallyable', 'exportiexporti #2
', 'toddlers', 'Children
', 376.40816326530614), ('n stcallyable', 'exportiexporti #2
', 'toddlers', None, 376.40816326530614), ('n stcallyable
', 'exportiexporti #2', None, None, 376.40816326530614), ('n stcal
lyable', None, None, None, 376.40816326530614), ('oughtcallyca
lly', 'edu packamalgamalg #16', 'aut
omotive', 'Electronics
', 379.1276595744681)]
```

SQL name: ./benchmark/tpcds/q23_1.sql...

=====

```
WITH
  frequent_ss_items AS (
```

```

SELECT
    "substr"("i_item_desc", 1, 30) "itemdesc"
    , "i_item_sk" "item_sk"
    , "d_date" "solddate"
    , "count"(*) "cnt"
FROM
    tpcds.tiny.store_sales
    , tpcds.tiny.date_dim
    , tpcds.tiny.item
WHERE ("ss_sold_date_sk" = "d_date_sk")
    AND ("ss_item_sk" = "i_item_sk")
    AND ("d_year" IN (2000      , (2000 + 1)      , (2000 + 2)      , (2000 + 3)))
GROUP BY "substr"("i_item_desc", 1, 30), "i_item_sk", "d_date"
HAVING ("count"(*) > 4)
)
, max_store_sales AS (
    SELECT "max"("csales") "tpcds_cmax"
    FROM
        (
            SELECT
                "c_customer_sk"
                , "sum"(("ss_quantity" * "ss_sales_price")) "csales"
            FROM
                tpcds.tiny.store_sales
                , tpcds.tiny.customer
                , tpcds.tiny.date_dim
            WHERE ("ss_customer_sk" = "c_customer_sk")
                AND ("ss_sold_date_sk" = "d_date_sk")
                AND ("d_year" IN (2000      , (2000 + 1)      , (2000 + 2)      , (2000 + 3)))
            GROUP BY "c_customer_sk"
        )
)
, best_ss_customer AS (
    SELECT
        "c_customer_sk"
        , "sum"(("ss_quantity" * "ss_sales_price")) "ssales"
    FROM
        tpcds.tiny.store_sales
        , tpcds.tiny.customer
    WHERE ("ss_customer_sk" = "c_customer_sk")
    GROUP BY "c_customer_sk"
    HAVING ("sum"(("ss_quantity" * "ss_sales_price")) > ((50 / DECIMAL '100.0') * (
        SELECT *

```

```

                FROM
                    max_store_sales
            )))
        )
    SELECT "sum"("sales")
    FROM
        (
            SELECT ("cs_quantity" * "cs_list_price") "sales"
            FROM
                tpcds.tiny.catalog_sales
            , tpcds.tiny.date_dim
            WHERE ("d_year" = 2000)
                AND ("d_moy" = 2)
                AND ("cs_sold_date_sk" = "d_date_sk")
                AND ("cs_item_sk" IN (
                    SELECT "item_sk"
                    FROM
                        frequent_ss_items
                ))
                AND ("cs_bill_customer_sk" IN (
                    SELECT "c_customer_sk"
                    FROM
                        best_ss_customer
                ))
        UNION ALL
            SELECT ("ws_quantity" * "ws_list_price") "sales"
            FROM
                tpcds.tiny.web_sales
            , tpcds.tiny.date_dim
            WHERE ("d_year" = 2000)
                AND ("d_moy" = 2)
                AND ("ws_sold_date_sk" = "d_date_sk")
                AND ("ws_item_sk" IN (
                    SELECT "item_sk"
                    FROM
                        frequent_ss_items
                ))
                AND ("ws_bill_customer_sk" IN (
                    SELECT "c_customer_sk"
                    FROM
                        best_ss_customer
                ))
        )
    )
    LIMIT 100

```

Results: completed in 2 sec

+++++

[(None,)]

SQL name: ./benchmark/tpcds/q23_2.sql...

=====

WITH

frequent_ss_items AS (

SELECT

"substr"("i_item_desc", 1, 30) "itemdesc"

, "i_item_sk" "item_sk"

, "d_date" "solddate"

, "count"(*) "cnt"

FROM

tpcds.tiny.store_sales

, tpcds.tiny.date_dim

, tpcds.tiny.item

WHERE ("ss_sold_date_sk" = "d_date_sk")

AND ("ss_item_sk" = "i_item_sk")

AND ("d_year" IN (2000, (2000 + 1), (2000 + 2), (2000 + 3)))

GROUP BY "substr"("i_item_desc", 1, 30), "i_item_sk", "d_date"

HAVING ("count"(*) > 4)

)

, max_store_sales AS (

SELECT "max"("csales") "tpcds_cmax"

FROM

(

SELECT

"c_customer_sk"

, "sum"("ss_quantity" * "ss_sales_price") "csales"

FROM

tpcds.tiny.store_sales

, tpcds.tiny.customer

, tpcds.tiny.date_dim

WHERE ("ss_customer_sk" = "c_customer_sk")

AND ("ss_sold_date_sk" = "d_date_sk")

AND ("d_year" IN (2000, (2000 + 1), (2000 + 2), (2000 + 3)))

GROUP BY "c_customer_sk"

```

    )
)
, best_ss_customer AS (
    SELECT
        "c_customer_sk"
    , "sum"(("ss_quantity" * "ss_sales_price")) "ssales"
    FROM
        tpcds.tiny.store_sales
    , tpcds.tiny.customer
    WHERE ("ss_customer_sk" = "c_customer_sk")
    GROUP BY "c_customer_sk"
    HAVING ("sum"(("ss_quantity" * "ss_sales_price")) > ((50 / DECIMAL '100.0') * (
        SELECT *
        FROM
            max_store_sales
        )))
)
SELECT
    "c_last_name"
, "c_first_name"
, "sales"
FROM
    (
        SELECT
            "c_last_name"
        , "c_first_name"
        , "sum"(("cs_quantity" * "cs_list_price")) "sales"
        FROM
            tpcds.tiny.catalog_sales
        , tpcds.tiny.customer
        , tpcds.tiny.date_dim
        WHERE ("d_year" = 2000)
            AND ("d_moy" = 2)
            AND ("cs_sold_date_sk" = "d_date_sk")
            AND ("cs_item_sk" IN (
                SELECT "item_sk"
                FROM
                    frequent_ss_items
            ))
        AND ("cs_bill_customer_sk" IN (
            SELECT "c_customer_sk"
            FROM
                best_ss_customer
        ))
    )

```



```

))
    AND ("cs_bill_customer_sk" = "c_customer_sk")
GROUP BY "c_last_name", "c_first_name"
UNION ALL
    SELECT
        "c_last_name"
    , "c_first_name"
    , "sum"(("ws_quantity" * "ws_list_price")) "sales"
FROM
    tpcds.tiny.web_sales
    , tpcds.tiny.customer
    , tpcds.tiny.date_dim
WHERE ("d_year" = 2000)
    AND ("d_moy" = 2)
    AND ("ws_sold_date_sk" = "d_date_sk")
    AND ("ws_item_sk" IN (
        SELECT "item_sk"
        FROM
            frequent_ss_items
    ))
    AND ("ws_bill_customer_sk" IN (
        SELECT "c_customer_sk"
        FROM
            best_ss_customer
    ))
    AND ("ws_bill_customer_sk" = "c_customer_sk")
GROUP BY "c_last_name", "c_first_name"
)
ORDER BY "c_last_name" ASC, "c_first_name" ASC, "sales" ASC
LIMIT 100

```

Results: completed in 2 sec

```

+++++
[]

```

SQL name: ./benchmark/tpcds/q24_1.sql...

=====

WITH

```

    ssales AS (
        SELECT
            "c_last_name"

```

```

    , "c_first_name"
    , "s_store_name"
    , "ca_state"
    , "s_state"
    , "i_color"
    , "i_current_price"
    , "i_manager_id"
    , "i_units"
    , "i_size"
    , "sum"("ss_net_paid") "netpaid"
FROM
    tpcds.tiny.store_sales
    , tpcds.tiny.store_returns
    , tpcds.tiny.store
    , tpcds.tiny.item
    , tpcds.tiny.customer
    , tpcds.tiny.customer_address
WHERE ("ss_ticket_number" = "sr_ticket_number")
    AND ("ss_item_sk" = "sr_item_sk")
    AND ("ss_customer_sk" = "c_customer_sk")
    AND ("ss_item_sk" = "i_item_sk")
    AND ("ss_store_sk" = "s_store_sk")
    AND ("c_birth_country" = "upper"("ca_country"))
    AND ("s_zip" = "ca_zip")
    AND ("s_market_id" = 8)
GROUP BY "c_last_name", "c_first_name", "s_store_name", "ca_state", "s_state", "i_color", "i_cur
rent_price", "i_manager_id", "i_units", "i_size"
)
SELECT
    "c_last_name"
    , "c_first_name"
    , "s_store_name"
    , "sum"("netpaid") "paid"
FROM
    ssales
WHERE ("i_color" = 'pale')
GROUP BY "c_last_name", "c_first_name", "s_store_name"
HAVING ("sum"("netpaid") > (
    SELECT (DECIMAL '0.05' * "avg"("netpaid"))
    FROM
        ssales
))

```

Results: completed in 2 sec

+++++

[]

SQL name: ./benchmark/tpcds/q24_2.sql...

=====

WITH

ssales AS (

SELECT

"c_last_name"

, "c_first_name"

, "s_store_name"

, "ca_state"

, "s_state"

, "i_color"

, "i_current_price"

, "i_manager_id"

, "i_units"

, "i_size"

, "sum"("ss_net_paid") "netpaid"

FROM

tpcds.tiny.store_sales

, tpcds.tiny.store_returns

, tpcds.tiny.store

, tpcds.tiny.item

, tpcds.tiny.customer

, tpcds.tiny.customer_address

WHERE ("ss_ticket_number" = "sr_ticket_number")

AND ("ss_item_sk" = "sr_item_sk")

AND ("ss_customer_sk" = "c_customer_sk")

AND ("ss_item_sk" = "i_item_sk")

AND ("ss_store_sk" = "s_store_sk")

AND ("c_birth_country" = "upper"("ca_country"))

AND ("s_zip" = "ca_zip")

AND ("s_market_id" = 8)

GROUP BY "c_last_name", "c_first_name", "s_store_name", "ca_state", "s_state", "i_color", "i_current_price", "i_manager_id", "i_units", "i_size"

)

SELECT

"c_last_name"

```

, "c_first_name"
, "s_store_name"
, "sum"("netpaid") "paid"
FROM
    ssales
WHERE ("i_color" = 'chiffon')
GROUP BY "c_last_name", "c_first_name", "s_store_name"
HAVING ("sum"("netpaid") > (
    SELECT (DECIMAL '0.05' * "avg"("netpaid"))
    FROM
        ssales
    ))
))

```

Results: completed in 2 sec

```

+++++
[]

```

SQL name: ./benchmark/tpcds/q25.sql...

=====

```

SELECT
    "i_item_id"
, "i_item_desc"
, "s_store_id"
, "s_store_name"
, "sum"("ss_net_profit") "store_sales_profit"
, "sum"("sr_net_loss") "store_returns_loss"
, "sum"("cs_net_profit") "catalog_sales_profit"
FROM
    tpcds.tiny.store_sales
, tpcds.tiny.store_returns
, tpcds.tiny.catalog_sales
, tpcds.tiny.date_dim d1
, tpcds.tiny.date_dim d2
, tpcds.tiny.date_dim d3
, tpcds.tiny.store
, tpcds.tiny.item
WHERE ("d1"."d_moy" = 4)
    AND ("d1"."d_year" = 2001)
    AND ("d1"."d_date_sk" = "ss_sold_date_sk")
    AND ("i_item_sk" = "ss_item_sk")

```

```

AND ("s_store_sk" = "ss_store_sk")
AND ("ss_customer_sk" = "sr_customer_sk")
AND ("ss_item_sk" = "sr_item_sk")
AND ("ss_ticket_number" = "sr_ticket_number")
AND ("sr_returned_date_sk" = "d2"."d_date_sk")
AND ("d2"."d_moy" BETWEEN 4 AND 10)
AND ("d2"."d_year" = 2001)
AND ("sr_customer_sk" = "cs_bill_customer_sk")
AND ("sr_item_sk" = "cs_item_sk")
AND ("cs_sold_date_sk" = "d3"."d_date_sk")
AND ("d3"."d_moy" BETWEEN 4 AND 10)
AND ("d3"."d_year" = 2001)
GROUP BY "i_item_id", "i_item_desc", "s_store_id", "s_store_name"
ORDER BY "i_item_id" ASC, "i_item_desc" ASC, "s_store_id" ASC, "s_store_name" ASC
LIMIT 100

```

Results: completed in 2 sec

+++++

[('AAAAAAAFMFAAAAA', 'Normal investments would reduce indeed. Informal, apparent women cannot ensure now seriously structural fears. Previ', 'AAAAAAACAAAAAA', 'able', '73.48', '46.86', '17.14')]

SQL name: ./benchmark/tpcds/q26.sql...

=====

```

SELECT
  "i_item_id"
, "avg"("cs_quantity") "agg1"
, "avg"("cs_list_price") "agg2"
, "avg"("cs_coupon_amt") "agg3"
, "avg"("cs_sales_price") "agg4"
FROM
  tpcds.tiny.catalog_sales
, tpcds.tiny.customer_demographics
, tpcds.tiny.date_dim
, tpcds.tiny.item
, tpcds.tiny.promotion
WHERE ("cs_sold_date_sk" = "d_date_sk")
  AND ("cs_item_sk" = "i_item_sk")
  AND ("cs_bill_cdemo_sk" = "cd_demo_sk")
  AND ("cs_promo_sk" = "p_promo_sk")
  AND ("cd_gender" = 'M')

```

```

AND ("cd_marital_status" = 'S')
AND ("cd_education_status" = 'College')
AND (("p_channel_email" = 'N')
      OR ("p_channel_event" = 'N'))
AND ("d_year" = 2000)
GROUP BY "i_item_id"
ORDER BY "i_item_id" ASC
LIMIT 100

```

Results: completed in 2 sec

```

+++++
[('AAAAAAAAAAEAAAAA', 92.0, '94.93', '1086.58', '92.73'), ('AAAAAAAAABDAAAAA', 80.0, '155.90', '0.0
0', '143.42'), ('AAAAAAAAABEAAAAA', 69.0, '32.57', '0.00', '10.74'), ('AAAAAAAAABGAAAAA', 43.0, '3
5.23', '0.00', '7.39'), ('AAAAAAAAACAAAAAA', 1.0, '126.38', '0.00', '60.66')]

```

SQL name: ./benchmark/tpcds/q27.sql...

```

=====
SELECT
  "i_item_id"
, "s_state"
, GROUPING ("s_state") "g_state"
, "avg"("ss_quantity") "agg1"
, "avg"("ss_list_price") "agg2"
, "avg"("ss_coupon_amt") "agg3"
, "avg"("ss_sales_price") "agg4"
FROM
  tpcds.tiny.store_sales
, tpcds.tiny.customer_demographics
, tpcds.tiny.date_dim
, tpcds.tiny.store
, tpcds.tiny.item
WHERE ("ss_sold_date_sk" = "d_date_sk")
  AND ("ss_item_sk" = "i_item_sk")
  AND ("ss_store_sk" = "s_store_sk")
  AND ("ss_cdemo_sk" = "cd_demo_sk")
  AND ("cd_gender" = 'M')
  AND ("cd_marital_status" = 'S')
  AND ("cd_education_status" = 'College')
  AND ("d_year" = 2002)
  AND ("s_state" IN (

```

```

        , 'TN'
        , 'TN'
        , 'TN'
        , 'TN'
        , 'TN'
        , 'TN'))
GROUP BY ROLLUP (i_item_id, s_state)
ORDER BY "i_item_id" ASC, "s_state" ASC
LIMIT 100

```

Results: completed in 2 sec

```

+++++
[('AAAAAAAAAAEAAAAA', 'TN', 0, None, '107.31', None, '64.38'), ('AAAAAAAAAAEAAAAA', None, 1, None, '107.31', None, '64.38'), ('AAAAAAAAAABBAAAAA', 'TN', 0, 78.0, '86.99', '1098.98', '31.31'), ('AAAAAAAAAABBAAAAA', None, 1, 78.0, '86.99', '1098.98', '31.31'), ('AAAAAAAAABHAAAAA', 'TN', 0, 77.0, '89.23', '0.00', '53.53')]

```

SQL name: ./benchmark/tpcds/q28.sql...

=====

```

SELECT *
FROM
(
  SELECT
    "avg"("ss_list_price") "b1_lp"
    , "count"("ss_list_price") "b1_cnt"
    , "count"(DISTINCT "ss_list_price") "b1_cntd"
  FROM
    tpcds.tiny.store_sales
  WHERE ("ss_quantity" BETWEEN 0 AND 5)
        AND (("ss_list_price" BETWEEN 8 AND (8 + 10))
              OR ("ss_coupon_amt" BETWEEN 459 AND (459 + 1000))
              OR ("ss_wholesale_cost" BETWEEN 57 AND (57 + 20)))
) b1
, (
  SELECT
    "avg"("ss_list_price") "b2_lp"
    , "count"("ss_list_price") "b2_cnt"
    , "count"(DISTINCT "ss_list_price") "b2_cntd"
  FROM

```

```

        tpcds.tiny.store_sales
WHERE ("ss_quantity" BETWEEN 6 AND 10)
      AND (("ss_list_price" BETWEEN 90 AND (90 + 10))
          OR ("ss_coupon_amt" BETWEEN 2323 AND (2323 + 1000))
          OR ("ss_wholesale_cost" BETWEEN 31 AND (31 + 20)))
) b2
, (
  SELECT
    "avg"("ss_list_price") "b3_lp"
  , "count"("ss_list_price") "b3_cnt"
  , "count"(DISTINCT "ss_list_price") "b3_cntd"
  FROM
    tpcds.tiny.store_sales
WHERE ("ss_quantity" BETWEEN 11 AND 15)
      AND (("ss_list_price" BETWEEN 142 AND (142 + 10))
          OR ("ss_coupon_amt" BETWEEN 12214 AND (12214 + 1000))
          OR ("ss_wholesale_cost" BETWEEN 79 AND (79 + 20)))
) b3
, (
  SELECT
    "avg"("ss_list_price") "b4_lp"
  , "count"("ss_list_price") "b4_cnt"
  , "count"(DISTINCT "ss_list_price") "b4_cntd"
  FROM
    tpcds.tiny.store_sales
WHERE ("ss_quantity" BETWEEN 16 AND 20)
      AND (("ss_list_price" BETWEEN 135 AND (135 + 10))
          OR ("ss_coupon_amt" BETWEEN 6071 AND (6071 + 1000))
          OR ("ss_wholesale_cost" BETWEEN 38 AND (38 + 20)))
) b4
, (
  SELECT
    "avg"("ss_list_price") "b5_lp"
  , "count"("ss_list_price") "b5_cnt"
  , "count"(DISTINCT "ss_list_price") "b5_cntd"
  FROM
    tpcds.tiny.store_sales
WHERE ("ss_quantity" BETWEEN 21 AND 25)
      AND (("ss_list_price" BETWEEN 122 AND (122 + 10))
          OR ("ss_coupon_amt" BETWEEN 836 AND (836 + 1000))
          OR ("ss_wholesale_cost" BETWEEN 17 AND (17 + 20)))
) b5
, (

```



```

SELECT
  "avg"("ss_list_price") "b6_lp"
, "count"("ss_list_price") "b6_cnt"
, "count"(DISTINCT "ss_list_price") "b6_cntd"
FROM
  tpcds.tiny.store_sales
WHERE ("ss_quantity" BETWEEN 26 AND 30)
      AND (("ss_list_price" BETWEEN 154 AND (154 + 10))
          OR ("ss_coupon_amt" BETWEEN 7326 AND (7326 + 1000))
          OR ("ss_wholesale_cost" BETWEEN 7 AND (7 + 20)))
) b6
LIMIT 100

```

Results: completed in 2 sec

+++++

[('77.93', 1468, 1345, '69.55', 1518, 1331, '134.06', 1167, 1107, '81.56', 1258, 1158, '60.27', 1
523, 1342, '38.99', 1322, 1152)]

SQL name: ./benchmark/tpcds/q29.sql...

=====

```

SELECT
  "i_item_id"
, "i_item_desc"
, "s_store_id"
, "s_store_name"
, "sum"("ss_quantity") "store_sales_quantity"
, "sum"("sr_return_quantity") "store_returns_quantity"
, "sum"("cs_quantity") "catalog_sales_quantity"
FROM
  tpcds.tiny.store_sales
, tpcds.tiny.store_returns
, tpcds.tiny.catalog_sales
, tpcds.tiny.date_dim d1
, tpcds.tiny.date_dim d2
, tpcds.tiny.date_dim d3
, tpcds.tiny.store
, tpcds.tiny.item
WHERE ("d1"."d_moy" = 9)
      AND ("d1"."d_year" = 1999)
      AND ("d1"."d_date_sk" = "ss_sold_date_sk")

```

```

AND ("i_item_sk" = "ss_item_sk")
AND ("s_store_sk" = "ss_store_sk")
AND ("ss_customer_sk" = "sr_customer_sk")
AND ("ss_item_sk" = "sr_item_sk")
AND ("ss_ticket_number" = "sr_ticket_number")
AND ("sr_returned_date_sk" = "d2"."d_date_sk")
AND ("d2"."d_moy" BETWEEN 9 AND (9 + 3))
AND ("d2"."d_year" = 1999)
AND ("sr_customer_sk" = "cs_bill_customer_sk")
AND ("sr_item_sk" = "cs_item_sk")
AND ("cs_sold_date_sk" = "d3"."d_date_sk")
AND ("d3"."d_year" IN (1999, (1999 + 1), (1999 + 2)))
GROUP BY "i_item_id", "i_item_desc", "s_store_id", "s_store_name"
ORDER BY "i_item_id" ASC, "i_item_desc" ASC, "s_store_id" ASC, "s_store_name" ASC
LIMIT 100

```

Results: completed in 2 sec

+++++

```

[('AAAAAAACGGAAAA', 'New, thin workshops might enhance considerably pregnant doors. Therefore m
iddle periods ought to make often bi', 'AAAAAAACAAAAAA', 'able', 9, 7, 36), ('AAAAAAAKAHAAAA
A', 'Long, fine teachers should not occur. Particular, monetary children organise in situ on to a
tests; details ma', 'AAAAAAABAAAAAA', 'ought', 34, 1, 75)]

```

SQL name: ./benchmark/tpcds/q30.sql...

=====

WITH

```

customer_total_return AS (
  SELECT
    "wr_returning_customer_sk" "ctr_customer_sk"
    , "ca_state" "ctr_state"
    , "sum"("wr_return_amt") "ctr_total_return"
  FROM
    tpcds.tiny.web_returns
    , tpcds.tiny.date_dim
    , tpcds.tiny.customer_address
  WHERE ("wr_returned_date_sk" = "d_date_sk")
    AND ("d_year" = 2002)
    AND ("wr_returning_addr_sk" = "ca_address_sk")
  GROUP BY "wr_returning_customer_sk", "ca_state"
)

```

```

SELECT
  "c_customer_id"
, "c_salutation"
, "c_first_name"
, "c_last_name"
, "c_preferred_cust_flag"
, "c_birth_day"
, "c_birth_month"
, "c_birth_year"
, "c_birth_country"
, "c_login"
, "c_email_address"
, "c_last_review_date_sk"
, "ctr_total_return"
FROM
  customer_total_return ctr1
, tpcds.tiny.customer_address
, tpcds.tiny.customer
WHERE ("ctr1"."ctr_total_return" > (
  SELECT ("avg"("ctr_total_return") * DECIMAL '1.2')
  FROM
    customer_total_return ctr2
  WHERE ("ctr1"."ctr_state" = "ctr2"."ctr_state")
))
AND ("ca_address_sk" = "c_current_addr_sk")
AND ("ca_state" = 'GA')
AND ("ctr1"."ctr_customer_sk" = "c_customer_sk")
ORDER BY "c_customer_id" ASC, "c_salutation" ASC, "c_first_name" ASC, "c_last_name" ASC, "c_preferred_cust_flag" ASC, "c_birth_day" ASC, "c_birth_month" ASC, "c_birth_year" ASC, "c_birth_country" ASC, "c_login" ASC, "c_email_address" ASC, "c_last_review_date_sk" ASC, "ctr_total_return" ASC
LIMIT 100

```

Results: completed in 1 sec

```

+++++
[('AAAAAAAABBCAAAAA', 'Sir', 'Michael', 'Herring', 2
'Y', 20, 9, 1932, 'AMERICAN SAMOA', None, 'Michael.Herring@j15PTAS.com
452300, '2306.71'), ('AAAAAAAABFAAAAAA', 'Ms.', 'Jessica', 'Levesque
', 'Y', 17, 7, 1940, 'ALBANIA', None, 'Jessica.Levesque@06mGqI9mHG.org', 24524
14, '10628.66'), ('AAAAAAAIIOCAAAAA', 'Dr.', 'Julio', 'Mcdaniel
', 'Y', 18, 4, 1952, 'UNITED STATES', None, 'Julio.Mcdaniel@2Hc.edu',
2452455, '3140.58'), ('AAAAAAAKIBAAAAA', 'Ms.', 'Brenda', 'Miner

```

```
', 'N', 8, 5, 1979, 'PARAGUAY', None, 'Brenda.Miner@8L.edu  
40, '834.48')]
```

', 24524

SQL name: ./benchmark/tpcds/q31.sql...

=====

WITH

```
    ss AS (  
        SELECT  
            "ca_county"  
        , "d_qoy"  
        , "d_year"  
        , "sum"("ss_ext_sales_price") "store_sales"  
        FROM  
            tpcds.tiny.store_sales  
        , tpcds.tiny.date_dim  
        , tpcds.tiny.customer_address  
        WHERE ("ss_sold_date_sk" = "d_date_sk")  
            AND ("ss_addr_sk" = "ca_address_sk")  
        GROUP BY "ca_county", "d_qoy", "d_year"  
    )  
    , ws AS (  
        SELECT  
            "ca_county"  
        , "d_qoy"  
        , "d_year"  
        , "sum"("ws_ext_sales_price") "web_sales"  
        FROM  
            tpcds.tiny.web_sales  
        , tpcds.tiny.date_dim  
        , tpcds.tiny.customer_address  
        WHERE ("ws_sold_date_sk" = "d_date_sk")  
            AND ("ws_bill_addr_sk" = "ca_address_sk")  
        GROUP BY "ca_county", "d_qoy", "d_year"  
    )  
SELECT  
    "ss1"."ca_county"  
    , "ss1"."d_year"  
    , ("ws2"."web_sales" / "ws1"."web_sales") "web_q1_q2_increase"  
    , ("ss2"."store_sales" / "ss1"."store_sales") "store_q1_q2_increase"  
    , ("ws3"."web_sales" / "ws2"."web_sales") "web_q2_q3_increase"  
    , ("ss3"."store_sales" / "ss2"."store_sales") "store_q2_q3_increase"  
FROM
```

```

    ss ss1
  , ss ss2
  , ss ss3
  , ws ws1
  , ws ws2
  , ws ws3
WHERE ("ss1"."d_qoy" = 1)
      AND ("ss1"."d_year" = 2000)
      AND ("ss1"."ca_county" = "ss2"."ca_county")
      AND ("ss2"."d_qoy" = 2)
      AND ("ss2"."d_year" = 2000)
      AND ("ss2"."ca_county" = "ss3"."ca_county")
      AND ("ss3"."d_qoy" = 3)
      AND ("ss3"."d_year" = 2000)
      AND ("ss1"."ca_county" = "ws1"."ca_county")
      AND ("ws1"."d_qoy" = 1)
      AND ("ws1"."d_year" = 2000)
      AND ("ws1"."ca_county" = "ws2"."ca_county")
      AND ("ws2"."d_qoy" = 2)
      AND ("ws2"."d_year" = 2000)
      AND ("ws1"."ca_county" = "ws3"."ca_county")
      AND ("ws3"."d_qoy" = 3)
      AND ("ws3"."d_year" = 2000)
      AND ((CASE WHEN ("ws1"."web_sales" > 0) THEN (CAST("ws2"."web_sales" AS DECIMAL(38,3)) / "ws
1"."web_sales") ELSE null END) > (CASE WHEN ("ss1"."store_sales" > 0) THEN (CAST("ss2"."store_sal
es" AS DECIMAL(38,3)) / "ss1"."store_sales") ELSE null END))
      AND ((CASE WHEN ("ws2"."web_sales" > 0) THEN (CAST("ws3"."web_sales" AS DECIMAL(38,3)) / "ws
2"."web_sales") ELSE null END) > (CASE WHEN ("ss2"."store_sales" > 0) THEN (CAST("ss3"."store_sal
es" AS DECIMAL(38,3)) / "ss2"."store_sales") ELSE null END))
ORDER BY "ss1"."ca_county" ASC

```

Results: completed in 2 sec

```

+++++
[]

```

SQL name: ./benchmark/tpcds/q32.sql...

=====

```

SELECT "sum"("cs_ext_discount_amt") "excess discount amount"
FROM
  tpcds.tiny.catalog_sales

```

```

, tpcds.tiny.item
, tpcds.tiny.date_dim
WHERE ("i_manufact_id" = 977)
  AND ("i_item_sk" = "cs_item_sk")
  AND ("d_date" BETWEEN CAST('2000-01-27' AS DATE) AND (CAST('2000-01-27' AS DATE) + INTERVAL
'90' DAY))
  AND ("d_date_sk" = "cs_sold_date_sk")
  AND ("cs_ext_discount_amt" > (
    SELECT (DECIMAL '1.3' * "avg"("cs_ext_discount_amt"))
    FROM
      tpcds.tiny.catalog_sales
    , tpcds.tiny.date_dim
    WHERE ("cs_item_sk" = "i_item_sk")
      AND ("d_date" BETWEEN CAST('2000-01-27' AS DATE) AND (CAST('2000-01-27' AS DATE) + INTER
VAL '90' DAY))
      AND ("d_date_sk" = "cs_sold_date_sk")
    ))
LIMIT 100

```

Results: completed in 2 sec
+++++
[(None,)]

SQL name: ./benchmark/tpcds/q33.sql...
=====

```

WITH
  ss AS (
    SELECT
      "i_manufact_id"
    , "sum"("ss_ext_sales_price") "total_sales"
    FROM
      tpcds.tiny.store_sales
    , tpcds.tiny.date_dim
    , tpcds.tiny.customer_address
    , tpcds.tiny.item
    WHERE ("i_manufact_id" IN (
      SELECT "i_manufact_id"
      FROM
        tpcds.tiny.item
      WHERE ("i_category" IN ('Electronics'))
    )

```

```

))
    AND ("ss_item_sk" = "i_item_sk")
    AND ("ss_sold_date_sk" = "d_date_sk")
    AND ("d_year" = 1998)
    AND ("d_moy" = 5)
    AND ("ss_addr_sk" = "ca_address_sk")
    AND ("ca_gmt_offset" = -5)
GROUP BY "i_manufact_id"
)
, cs AS (
    SELECT
        "i_manufact_id"
    , "sum"("cs_ext_sales_price") "total_sales"
    FROM
        tpcds.tiny.catalog_sales
    , tpcds.tiny.date_dim
    , tpcds.tiny.customer_address
    , tpcds.tiny.item
    WHERE ("i_manufact_id" IN (
        SELECT "i_manufact_id"
        FROM
            tpcds.tiny.item
        WHERE ("i_category" IN ('Electronics'))
    ))
))
    AND ("cs_item_sk" = "i_item_sk")
    AND ("cs_sold_date_sk" = "d_date_sk")
    AND ("d_year" = 1998)
    AND ("d_moy" = 5)
    AND ("cs_bill_addr_sk" = "ca_address_sk")
    AND ("ca_gmt_offset" = -5)
GROUP BY "i_manufact_id"
)
, ws AS (
    SELECT
        "i_manufact_id"
    , "sum"("ws_ext_sales_price") "total_sales"
    FROM
        tpcds.tiny.web_sales
    , tpcds.tiny.date_dim
    , tpcds.tiny.customer_address
    , tpcds.tiny.item
    WHERE ("i_manufact_id" IN (
        SELECT "i_manufact_id"

```

```

        FROM
            tpcds.tiny.item
        WHERE ("i_category" IN ('Electronics'))
    ))
    AND ("ws_item_sk" = "i_item_sk")
    AND ("ws_sold_date_sk" = "d_date_sk")
    AND ("d_year" = 1998)
    AND ("d_moy" = 5)
    AND ("ws_bill_addr_sk" = "ca_address_sk")
    AND ("ca_gmt_offset" = -5)
GROUP BY "i_manufact_id"
)
SELECT
    "i_manufact_id"
, "sum"("total_sales") "total_sales"
FROM
    (
        SELECT *
        FROM
            SS
        UNION ALL
        SELECT *
        FROM
            CS
        UNION ALL
        SELECT *
        FROM
            WS
    ) tmp1
GROUP BY "i_manufact_id"
ORDER BY "total_sales" ASC
LIMIT 100

```

Results: completed in 2 sec

+++++

[(609, '0.00'), (590, '37.31'), (229, '49.14'), (171, '90.56'), (350, '193.17')]

SQL name: ./benchmark/tpcds/q34.sql...

=====

```

SELECT
    "c_last_name"
, "c_first_name"

```



```

, "c_salutation"
, "c_preferred_cust_flag"
, "ss_ticket_number"
, "cnt"
FROM
(
  SELECT
    "ss_ticket_number"
  , "ss_customer_sk"
  , "count"(*) "cnt"
  FROM
    tpcds.tiny.store_sales
  , tpcds.tiny.date_dim
  , tpcds.tiny.store
  , tpcds.tiny.household_demographics
  WHERE ("store_sales"."ss_sold_date_sk" = "date_dim"."d_date_sk")
    AND ("store_sales"."ss_store_sk" = "store"."s_store_sk")
    AND ("store_sales"."ss_hdemo_sk" = "household_demographics"."hd_demo_sk")
    AND (("date_dim"."d_dom" BETWEEN 1 AND 3)
      OR ("date_dim"."d_dom" BETWEEN 25 AND 28))
    AND (("household_demographics"."hd_buy_potential" = '>10000')
      OR ("household_demographics"."hd_buy_potential" = 'Unknown'))
    AND ("household_demographics"."hd_vehicle_count" > 0)
    AND ((CASE WHEN ("household_demographics"."hd_vehicle_count" > 0) THEN (CAST("household_dem
ographics"."hd_dep_count" AS DECIMAL(7,2)) / "household_demographics"."hd_vehicle_count") ELSE nu
ll END) > DECIMAL '1.2')
    AND ("date_dim"."d_year" IN (1999 , (1999 + 1) , (1999 + 2)))
    AND ("store"."s_county" IN ('Williamson County' , 'Williamson County' , 'Williamson Cou
nty' , 'Williamson County' , 'Williamson County' , 'Williamson County' , 'Williamson Coun
ty' , 'Williamson County'))
  GROUP BY "ss_ticket_number", "ss_customer_sk"
) dn
, tpcds.tiny.customer
WHERE ("ss_customer_sk" = "c_customer_sk")
AND ("cnt" BETWEEN 15 AND 20)
ORDER BY "c_last_name" ASC, "c_first_name" ASC, "c_salutation" ASC, "c_preferred_cust_flag" DESC,
"ss_ticket_number" ASC

```

Results: completed in 2 sec

+++++

[('Brown', 'Michael', 'Sir', 'N', 7856, 15), ('Bruns

```

on                                     ', 'Albert', 'Ms.', 'N', 3324, 15), ('Gentry
', 'Russell', 'Sir', 'N', 7184, 15), ('Hart', None,
None, 'Y', 4376, 15), ('Holland', 'Delia', 'Miss',
'N', 6311, 15)]

```

SQL name: ./benchmark/tpcds/q35.sql...

```

=====
SELECT
  "ca_state"
, "cd_gender"
, "cd_marital_status"
, "cd_dep_count"
, "count"(*) "cnt1"
, "min"("cd_dep_count")
, "max"("cd_dep_count")
, "avg"("cd_dep_count")
, "cd_dep_employed_count"
, "count"(*) "cnt2"
, "min"("cd_dep_employed_count")
, "max"("cd_dep_employed_count")
, "avg"("cd_dep_employed_count")
, "cd_dep_college_count"
, "count"(*) "cnt3"
, "min"("cd_dep_college_count")
, "max"("cd_dep_college_count")
, "avg"("cd_dep_college_count")
FROM
  tpcds.tiny.customer c
, tpcds.tiny.customer_address ca
, tpcds.tiny.customer_demographics
WHERE ("c"."c_current_addr_sk" = "ca"."ca_address_sk")
  AND ("cd_demo_sk" = "c"."c_current_cdemo_sk")
  AND (EXISTS (
    SELECT *
    FROM
      tpcds.tiny.store_sales
    , tpcds.tiny.date_dim
    WHERE ("c"."c_customer_sk" = "ss_customer_sk")
      AND ("ss_sold_date_sk" = "d_date_sk")
      AND ("d_year" = 2002)
      AND ("d_qoy" < 4)
  ))

```

```

AND ((EXISTS (
    SELECT *
    FROM
        tpcds.tiny.web_sales
    , tpcds.tiny.date_dim
    WHERE ("c"."c_customer_sk" = "ws_bill_customer_sk")
        AND ("ws_sold_date_sk" = "d_date_sk")
        AND ("d_year" = 2002)
        AND ("d_qoy" < 4)
))
OR (EXISTS (
    SELECT *
    FROM
        tpcds.tiny.catalog_sales
    , tpcds.tiny.date_dim
    WHERE ("c"."c_customer_sk" = "cs_ship_customer_sk")
        AND ("cs_sold_date_sk" = "d_date_sk")
        AND ("d_year" = 2002)
        AND ("d_qoy" < 4)
)))
GROUP BY "ca_state", "cd_gender", "cd_marital_status", "cd_dep_count", "cd_dep_employed_count",
"cd_dep_college_count"
ORDER BY "ca_state" ASC, "cd_gender" ASC, "cd_marital_status" ASC, "cd_dep_count" ASC, "cd_dep_employed_count" ASC, "cd_dep_college_count" ASC
LIMIT 100

```

Traceback (most recent call last):

```

File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.py", line 955, in fetchone
    row = dbapi_cursor.fetchone()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 106, in fetchone
    self._fetch_while(lambda: not self._data and self._state != self._STATE_FINISHED)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 46, in _fetch_while
    self._fetch_more()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 308, in _fetch_more
    self._process_response(self._requests_session.get(self._nextUri, **self._requests_kwargs))
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 349, in _process_response

```

```
raise DatabaseError(response_json['error'])
pyhive.exc.DatabaseError: {'message': 'Query exceeded per-node user memory limit of 102.40MB [All
ocated: 102.25MB, Delta: 1.09MB, Top Consumers: {HashBuilderOperator=102.25MB, ScanFilterAndProje
ctOperator=2.51MB, PartitionedOutputOperator=2.16MB}, Details: [{\"taskId\":\"3.0.0\",\"reservatio
n\":\"96.21MB\",\"topConsumers\": [{\"type\":\"HashBuilderOperator\",\"planNodeId\":\"4\",\"reservations\":[\"6.58
MB\",\"6.57MB\",\"6.57MB\",\"6.56MB\",\"6.56MB\",\"6.56MB\",\"6.55MB\",\"6.55MB\",\"5.48MB\",\"5.47MB\",\"5.47MB\",\"5.
46MB\",\"5.46MB\",\"5.46MB\",\"5.46MB\",\"5.45MB\"],\"total\":\"96.21MB\",\"info\":\"INNER;PARTITIONED;\"}], {\"tas
kId\":\"8.0.0\",\"reservation\":\"2.36MB\",\"topConsumers\": [{\"type\":\"HashBuilderOperator\",\"planNodeId\":\"2
94\",\"reservations\": [\"128.88kB\",\"128.87kB\",\"128.83kB\",\"128.83kB\",\"128.82kB\",\"128.82kB\",\"128.80k
B\",\"128.78kB\",\"128.77kB\",\"128.77kB\",\"128.75kB\",\"128.75kB\",\"128.75kB\",\"128.75kB\",\"128.72kB\",\"128.6
2kB\"],\"total\":\"2.01MB\",\"info\":\"INNER;PARTITIONED;\"}, {\"type\":\"HashAggregationOperator\",\"planNodeI
d\":\"2131\",\"reservations\": [\"353.04kB\",\"0B\",\"0B\",\"0B\",\"0B\",\"0B\",\"0B\",\"0B\",\"0B\",\"0B\",\"0B\",\"0
B\",\"0B\",\"0B\",\"0B\"],\"total\":\"353.04kB\",\"info\":\"PARTIAL;\"}], {\"taskId\":\"15.0.0\",\"reservation\":\"2.33
MB\",\"topConsumers\": [{\"type\":\"ScanFilterAndProjectOperator\",\"planNodeId\":\"2315\",\"reservations\":
[\"1.25MB\"],\"total\":\"1.25MB\"}, {\"type\":\"PartitionedOutputOperator\",\"planNodeId\":\"2315\",\"reservation
s\": [\"1.08MB\"],\"total\":\"1.08MB\"}]}]\", 'errorCode': 131079, 'errorName': 'EXCEEDED_LOCAL_MEMORY_LI
MIT', 'errorType': 'INSUFFICIENT_RESOURCES', 'boolean': False, 'failureInfo': {'type': 'com.faceb
ook.presto.ExceededMemoryLimitException', 'message': 'Query exceeded per-node user memory limit o
f 102.40MB [Allocated: 102.25MB, Delta: 1.09MB, Top Consumers: {HashBuilderOperator=102.25MB, Sca
nFilterAndProjectOperator=2.51MB, PartitionedOutputOperator=2.16MB}, Details: [{\"taskId\":\"3.0.
0\",\"reservation\":\"96.21MB\",\"topConsumers\": [{\"type\":\"HashBuilderOperator\",\"planNodeId\":\"4\",\"reserv
ations\": [\"6.58MB\",\"6.57MB\",\"6.57MB\",\"6.56MB\",\"6.56MB\",\"6.56MB\",\"6.55MB\",\"6.55MB\",\"5.48MB\",\"5.47M
B\",\"5.47MB\",\"5.46MB\",\"5.46MB\",\"5.46MB\",\"5.45MB\"],\"total\":\"96.21MB\",\"info\":\"INNER;PARTITI
ONED;\"}], {\"taskId\":\"8.0.0\",\"reservation\":\"2.36MB\",\"topConsumers\": [{\"type\":\"HashBuilderOperato
r\",\"planNodeId\":\"294\",\"reservations\": [\"128.88kB\",\"128.87kB\",\"128.83kB\",\"128.83kB\",\"128.82kB\",\"12
8.82kB\",\"128.80kB\",\"128.78kB\",\"128.77kB\",\"128.77kB\",\"128.75kB\",\"128.75kB\",\"128.75kB\",\"128.75k
B\",\"128.72kB\",\"128.62kB\"],\"total\":\"2.01MB\",\"info\":\"INNER;PARTITIONED;\"}, {\"type\":\"HashAggregationO
perator\",\"planNodeId\":\"2131\",\"reservations\": [\"353.04kB\",\"0B\",\"0B\",\"0B\",\"0B\",\"0B\",\"0B\",\"0B\",\"0
B\",\"0B\",\"0B\",\"0B\",\"0B\",\"0B\",\"0B\"],\"total\":\"353.04kB\",\"info\":\"PARTIAL;\"}], {\"taskId\":\"15.0.
0\",\"reservation\":\"2.33MB\",\"topConsumers\": [{\"type\":\"ScanFilterAndProjectOperator\",\"planNodeId\":\"23
15\",\"reservations\": [\"1.25MB\"],\"total\":\"1.25MB\"}, {\"type\":\"PartitionedOutputOperator\",\"planNodeI
d\":\"2315\",\"reservations\": [\"1.08MB\"],\"total\":\"1.08MB\"}]}]\", 'suppressed': [], 'stack': ['com.face
book.presto.ExceededMemoryLimitException.exceededLocalUserMemoryLimit(ExceededMemoryLimitExceptio
n.java:49)', 'com.facebook.presto.memory.QueryContext.enforceUserMemoryLimit(QueryContext.java:49
6)', 'com.facebook.presto.memory.QueryContext.updateUserMemory(QueryContext.java:192)', 'com.face
book.presto.memory.QueryContext$QueryMemoryReservationHandler.reserveMemory(QueryContext.java:46
2)', 'com.facebook.presto.memory.context.RootAggregatedMemoryContext.updateBytes(RootAggregatedMe
memoryContext.java:37)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateByt
es(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMem
oryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.contex
t.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.
presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:
38)', 'com.facebook.presto.memory.context.SimpleLocalMemoryContext.setBytes(SimpleLocalMemoryCont
```

```
ext.java:82)', 'com.facebook.presto.operator.OperatorContext$InternalLocalMemoryContext.setBytes
(OperatorContext.java:672)', 'com.facebook.presto.operator.HashBuilderOperator.finishInput(HashBu
ilderOperator.java:503)', 'com.facebook.presto.operator.HashBuilderOperator.finish(HashBuilderOpe
rator.java:454)', 'com.facebook.presto.operator.Driver.processInternal(Driver.java:441)', 'com.fa
cebook.presto.operator.Driver.lambda$processFor$9(Driver.java:301)', 'com.facebook.presto.operato
r.Driver.tryWithLock(Driver.java:722)', 'com.facebook.presto.operator.Driver.processFor(Driver.ja
va:294)', 'com.facebook.presto.execution.SqlTaskExecution$DriverSplitRunner.processFor(SqlTaskExe
cution.java:1077)', 'com.facebook.presto.execution.executor.PrioritizedSplitRunner.process(Priori
tizedSplitRunner.java:162)', 'com.facebook.presto.execution.executor.TaskExecutor$TaskRunner.run
(TaskExecutor.java:599)', 'com.facebook.presto.$gen.Presto_0_263_b9fd4d4____20211010_164639_1.run
(Unknown Source)', 'java.base/java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecuto
r.java:1128)', 'java.base/java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.j
ava:628)', 'java.base/java.lang.Thread.run(Thread.java:829)']}]}
```

The above exception was the direct cause of the following exception:

Traceback (most recent call last):

```
File "/tmp/ipykernel_394536/722970930.py", line 15, in <module>
    for row in rs:
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/result.p
y", line 381, in iterrows
    for row in self._fetchiter_impl():
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.p
y", line 1788, in _fetchiter_impl
    row = fetchone(self, self.cursor)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.p
y", line 960, in fetchone
    self.handle_exception(result, dbapi_cursor, e)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.p
y", line 941, in handle_exception
    result.connection._handle_dbapi_exception(
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py",
line 2023, in _handle_dbapi_exception
    util.raise_(
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/util/compat.py",
line 207, in raise_
    raise exception
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.p
y", line 955, in fetchone
    row = dbapi_cursor.fetchone()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 10
6, in fetchone
    self._fetch_while(lambda: not self._data and self._state != self._STATE_FINISHED)
```

```

File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 46,
in _fetch_while
    self._fetch_more()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 30
8, in _fetch_more
    self._process_response(self._requests_session.get(self._nextUri, **self._requests_kwargs))
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 34
9, in _process_response
    raise DatabaseError(response_json['error'])
sqlalchemy.exc.DatabaseError: (pyhive.exc.DatabaseError) {'message': 'Query exceeded per-node use
r memory limit of 102.40MB [Allocated: 102.25MB, Delta: 1.09MB, Top Consumers: {HashBuilderOperat
or=102.25MB, ScanFilterAndProjectOperator=2.51MB, PartitionedOutputOperator=2.16MB}, Details:
[{"taskId":"3.0.0","reservation":"96.21MB","topConsumers":[{"type":"HashBuilderOperator","planNod
eId":"4","reservations":["6.58MB","6.57MB","6.57MB","6.56MB","6.56MB","6.56MB","6.55MB","6.55M
B","5.48MB","5.47MB","5.47MB","5.46MB","5.46MB","5.46MB","5.46MB","5.45MB"],"total":"96.21MB","in
fo":"INNER;PARTITIONED;"}]},{taskId":"8.0.0","reservation":"2.36MB","topConsumers":[{"type":"Has
hBuilderOperator","planNodeId":"294","reservations":["128.88kB","128.87kB","128.83kB","128.83k
B","128.82kB","128.82kB","128.80kB","128.78kB","128.77kB","128.77kB","128.75kB","128.75kB","128.7
5kB","128.75kB","128.72kB","128.62kB"],"total":"2.01MB","info":"INNER;PARTITIONED;"}]},{type":"Has
hAggregationOperator","planNodeId":"2131","reservations":["353.04kB","0B","0B","0B","0B","0B","0
B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B"],"total":"353.04kB","info":"PARTIAL;"}]},{taskId":"15.0.0","reservation":"2.33MB","topConsumers":[{"type":"ScanFilterAndProjectOperator","planNo
deId":"2315","reservations":["1.25MB"],"total":"1.25MB"}, {"type":"PartitionedOutputOperator","pla
nNodeId":"2315","reservations":["1.08MB"],"total":"1.08MB"}]}}]', 'errorCode': 131079, 'errorNam
e': 'EXCEEDED_LOCAL_MEMORY_LIMIT', 'errorType': 'INSUFFICIENT_RESOURCES', 'boolean': False, 'fail
ureInfo': {'type': 'com.facebook.presto.ExceededMemoryLimitException', 'message': 'Query exceeded
per-node user memory limit of 102.40MB [Allocated: 102.25MB, Delta: 1.09MB, Top Consumers: {HashB
uilderOperator=102.25MB, ScanFilterAndProjectOperator=2.51MB, PartitionedOutputOperator=2.16MB},
Details: [{"taskId":"3.0.0","reservation":"96.21MB","topConsumers":[{"type":"HashBuilderOperato
r","planNodeId":"4","reservations":["6.58MB","6.57MB","6.57MB","6.56MB","6.56MB","6.56MB","6.55M
B","6.55MB","5.48MB","5.47MB","5.47MB","5.46MB","5.46MB","5.46MB","5.46MB","5.45MB"],"total":"96.
21MB","info":"INNER;PARTITIONED;"}]},{taskId":"8.0.0","reservation":"2.36MB","topConsumers":[{"t
ype":"HashBuilderOperator","planNodeId":"294","reservations":["128.88kB","128.87kB","128.83kB","1
28.83kB","128.82kB","128.82kB","128.80kB","128.78kB","128.77kB","128.77kB","128.75kB","128.75k
B","128.75kB","128.75kB","128.72kB","128.62kB"],"total":"2.01MB","info":"INNER;PARTITIONED;"}]},{t
ype":"HashAggregationOperator","planNodeId":"2131","reservations":["353.04kB","0B","0B","0B","0
B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B"],"total":"353.04kB","info":"PARTIA
L;"}]},{taskId":"15.0.0","reservation":"2.33MB","topConsumers":[{"type":"ScanFilterAndProjectOpe
rator","planNodeId":"2315","reservations":["1.25MB"],"total":"1.25MB"}, {"type":"PartitionedOutput
Operator","planNodeId":"2315","reservations":["1.08MB"],"total":"1.08MB"}]}}]', 'suppressed': [],
'stack': ['com.facebook.presto.ExceededMemoryLimitException.exceededLocalUserMemoryLimit(Exceeded
MemoryLimitException.java:49)', 'com.facebook.presto.memory.QueryContext.enforceUserMemoryLimit(Q
ueryContext.java:496)', 'com.facebook.presto.memory.QueryContext.updateUserMemory(QueryContext.ja

```

```
va:192)', 'com.facebook.presto.memory.QueryContext$QueryMemoryReservationHandler.reserveMemory(Qu
eryContext.java:462)', 'com.facebook.presto.memory.context.RootAggregatedMemoryContext.updateByte
s(RootAggregatedMemoryContext.java:37)', 'com.facebook.presto.memory.context.ChildAggregatedMemor
yContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.
ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.pr
esto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:3
8)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregated
MemoryContext.java:38)', 'com.facebook.presto.memory.context.SimpleLocalMemoryContext.setBytes(Si
mpleLocalMemoryContext.java:82)', 'com.facebook.presto.operator.OperatorContext$InternalLocalMemo
ryContext.setBytes(OperatorContext.java:672)', 'com.facebook.presto.operator.HashBuilderOperator.
finishInput(HashBuilderOperator.java:503)', 'com.facebook.presto.operator.HashBuilderOperator.fin
ish(HashBuilderOperator.java:454)', 'com.facebook.presto.operator.Driver.processInternal(Driver.j
ava:441)', 'com.facebook.presto.operator.Driver.lambda$processFor$9(Driver.java:301)', 'com.faceb
ook.presto.operator.Driver.tryWithLock(Driver.java:722)', 'com.facebook.presto.operator.Driver.pr
ocessFor(Driver.java:294)', 'com.facebook.presto.execution.SqlTaskExecution$DriverSplitRunner.pro
cessFor(SqlTaskExecution.java:1077)', 'com.facebook.presto.execution.executor.PrioritizedSplitRun
ner.process(PrioritizedSplitRunner.java:162)', 'com.facebook.presto.execution.executor.TaskExecut
or$TaskRunner.run(TaskExecutor.java:599)', 'com.facebook.presto.$gen.Presto_0_263_b9fd4d4_2021
1010_164639_1.run(Unknown Source)', 'java.base/java.util.concurrent.ThreadPoolExecutor.runWorker
(ThreadPoolExecutor.java:1128)', 'java.base/java.util.concurrent.ThreadPoolExecutor$Worker.run(Th
readPoolExecutor.java:628)', 'java.base/java.lang.Thread.run(Thread.java:829)' ]}}
```

(Background on this error at: <https://sqlalche.me/e/14/4xp6>) (<https://sqlalche.me/e/14/4xp6>)

SQL name: ./benchmark/tpcds/q36.sql...

=====

SELECT

```
    ("sum"("ss_net_profit") / "sum"("ss_ext_sales_price")) "gross_margin"
, "i_category"
, "i_class"
, (GROUPING ("i_category") + GROUPING ("i_class")) "lochierarchy"
, "rank"() OVER (PARTITION BY (GROUPING ("i_category") + GROUPING ("i_class")), (CASE WHEN (GROUP
ING ("i_class") = 0) THEN "i_category" END) ORDER BY ("sum"("ss_net_profit") / "sum"("ss_ext_sale
s_price")) ASC) "rank_within_parent"
FROM
    tpcds.tiny.store_sales
, tpcds.tiny.date_dim d1
, tpcds.tiny.item
, tpcds.tiny.store
WHERE ("d1"."d_year" = 2001)
    AND ("d1"."d_date_sk" = "ss_sold_date_sk")
    AND ("i_item_sk" = "ss_item_sk")
```

```

AND ("s_store_sk" = "ss_store_sk")
AND ("s_state" IN (
    'TN'
    , 'TN'
    , 'TN'
    , 'TN'
    , 'TN'
    , 'TN'
    , 'TN'
    , 'TN'))
GROUP BY ROLLUP (i_category, i_class)
ORDER BY "lochierarchy" DESC, (CASE WHEN ("lochierarchy" = 0) THEN "i_category" END) ASC, "rank_w
ithin_parent" ASC, "i_category", "i_class"
LIMIT 100

```

Results: completed in 2 sec

+++++

```

[('-0.43', None, None, 2, 1), ('-0.45', 'Books', None, 1, 1), ('-0.45', 'Men', None, 1, 1), ('-0.45', 'Musical', None, 1, 1), ('-0.45', 'Shoes', None, 1, 1)]

```

SQL name: ./benchmark/tpcds/q37.sql...

=====

```

SELECT
    "i_item_id"
    , "i_item_desc"
    , "i_current_price"
FROM
    tpcds.tiny.item
    , tpcds.tiny.inventory
    , tpcds.tiny.date_dim
    , tpcds.tiny.catalog_sales
WHERE ("i_current_price" BETWEEN 68 AND (68 + 30))
    AND ("inv_item_sk" = "i_item_sk")
    AND ("d_date_sk" = "inv_date_sk")
    AND (CAST("d_date" AS DATE) BETWEEN CAST('2000-02-01' AS DATE) AND (CAST('2000-02-01' AS DATE) +
INTERVAL '60' DAY))

```



```

        AND ("i_manufact_id" IN (677, 940, 694, 808))
        AND ("inv_quantity_on_hand" BETWEEN 100 AND 500)
        AND ("cs_item_sk" = "i_item_sk")
    GROUP BY "i_item_id", "i_item_desc", "i_current_price"
    ORDER BY "i_item_id" ASC
    LIMIT 100

```

Results: completed in 2 sec

```

+++++
[]

```

SQL name: ./benchmark/tpcds/q38.sql...

```

=====
SELECT "count"(*)
FROM
(
    SELECT DISTINCT
        "c_last_name"
        , "c_first_name"
        , "d_date"
    FROM
        tpcds.tiny.store_sales
        , tpcds.tiny.date_dim
        , tpcds.tiny.customer
    WHERE ("store_sales"."ss_sold_date_sk" = "date_dim"."d_date_sk")
        AND ("store_sales"."ss_customer_sk" = "customer"."c_customer_sk")
        AND ("d_month_seq" BETWEEN 1200 AND (1200 + 11))
    INTERSECT      SELECT DISTINCT
        "c_last_name"
        , "c_first_name"
        , "d_date"
    FROM
        tpcds.tiny.catalog_sales
        , tpcds.tiny.date_dim
        , tpcds.tiny.customer
    WHERE ("catalog_sales"."cs_sold_date_sk" = "date_dim"."d_date_sk")
        AND ("catalog_sales"."cs_bill_customer_sk" = "customer"."c_customer_sk")
        AND ("d_month_seq" BETWEEN 1200 AND (1200 + 11))
    INTERSECT      SELECT DISTINCT
        "c_last_name"

```

```

, "c_first_name"
, "d_date"
FROM
  tpcds.tiny.web_sales
, tpcds.tiny.date_dim
, tpcds.tiny.customer
WHERE ("web_sales"."ws_sold_date_sk" = "date_dim"."d_date_sk")
      AND ("web_sales"."ws_bill_customer_sk" = "customer"."c_customer_sk")
      AND ("d_month_seq" BETWEEN 1200 AND (1200 + 11))
) hot_cust
LIMIT 100

```

Results: completed in 2 sec

+++++

[(0,)]

SQL name: ./benchmark/tpcds/q39_1.sql...

=====

WITH

```

  inv AS (
    SELECT
      "w_warehouse_name"
    , "w_warehouse_sk"
    , "i_item_sk"
    , "d_moy"
    , "stdev"
    , "mean"
    , (CASE "mean" WHEN 0 THEN null ELSE ("stdev" / "mean") END) "cov"
    FROM
      (
        SELECT
          "w_warehouse_name"
        , "w_warehouse_sk"
        , "i_item_sk"
        , "d_moy"
        , "stddev_samp"("inv_quantity_on_hand") "stdev"
        , "avg"("inv_quantity_on_hand") "mean"
        FROM
          tpcds.tiny.inventory
        , tpcds.tiny.item

```

```

        , tpcds.tiny.warehouse
        , tpcds.tiny.date_dim
    WHERE ("inv_item_sk" = "i_item_sk")
        AND ("inv_warehouse_sk" = "w_warehouse_sk")
        AND ("inv_date_sk" = "d_date_sk")
        AND ("d_year" = 2001)
    GROUP BY "w_warehouse_name", "w_warehouse_sk", "i_item_sk", "d_moy"
    ) foo
    WHERE ((CASE "mean" WHEN 0 THEN 0 ELSE ("stdev" / "mean") END) > 1)
)
SELECT
    "inv1"."w_warehouse_sk"
    , "inv1"."i_item_sk"
    , "inv1"."d_moy"
    , "inv1"."mean"
    , "inv1"."cov"
    , "inv2"."w_warehouse_sk"
    , "inv2"."i_item_sk"
    , "inv2"."d_moy"
    , "inv2"."mean"
    , "inv2"."cov"
FROM
    inv inv1
    , inv inv2
WHERE ("inv1"."i_item_sk" = "inv2"."i_item_sk")
    AND ("inv1"."w_warehouse_sk" = "inv2"."w_warehouse_sk")
    AND ("inv1"."d_moy" = 1)
    AND ("inv2"."d_moy" = (1 + 1))
ORDER BY "inv1"."w_warehouse_sk" ASC, "inv1"."i_item_sk" ASC, "inv1"."d_moy" ASC, "inv1"."mean" AS
C, "inv1"."cov" ASC, "inv2"."d_moy" ASC, "inv2"."mean" ASC, "inv2"."cov" ASC

```

Results: completed in 2 sec

+++++

```

[(1, 633, 1, 222.0, 1.0202744134779214, 1, 633, 2, 349.3333333333333, 1.384991391229172), (1, 675,
1, 381.25, 1.11775334231886, 1, 675, 2, 255.5, 1.0149923616429948), (1, 1157, 1, 338.0, 1.286893828
153513, 1, 1157, 2, 354.25, 1.238665136837553), (1, 1637, 1, 298.0, 1.1390924645167293, 1, 1637, 2,
234.0, 1.1236526470143164)]

```

SQL name: ./benchmark/tpcds/q39_2.sql...

=====

```

WITH
  inv AS (
    SELECT
      "w_warehouse_name"
    , "w_warehouse_sk"
    , "i_item_sk"
    , "d_moy"
    , "stdev"
    , "mean"
    , (CASE "mean" WHEN 0 THEN null ELSE ("stdev" / "mean") END) "cov"
    FROM
      (
        SELECT
          "w_warehouse_name"
        , "w_warehouse_sk"
        , "i_item_sk"
        , "d_moy"
        , "stddev_samp"("inv_quantity_on_hand") "stdev"
        , "avg"("inv_quantity_on_hand") "mean"
        FROM
          tpcds.tiny.inventory
        , tpcds.tiny.item
        , tpcds.tiny.warehouse
        , tpcds.tiny.date_dim
        WHERE ("inv_item_sk" = "i_item_sk")
          AND ("inv_warehouse_sk" = "w_warehouse_sk")
          AND ("inv_date_sk" = "d_date_sk")
          AND ("d_year" = 2001)
        GROUP BY "w_warehouse_name", "w_warehouse_sk", "i_item_sk", "d_moy"
      ) foo
    WHERE ((CASE "mean" WHEN 0 THEN 0 ELSE ("stdev" / "mean") END) > 1)
  )
SELECT
  "inv1"."w_warehouse_sk"
, "inv1"."i_item_sk"
, "inv1"."d_moy"
, "inv1"."mean"
, "inv1"."cov"
, "inv2"."w_warehouse_sk"
, "inv2"."i_item_sk"
, "inv2"."d_moy"
, "inv2"."mean"
, "inv2"."cov"

```

```

FROM
  inv inv1
, inv inv2
WHERE ("inv1"."i_item_sk" = "inv2"."i_item_sk")
      AND ("inv1"."w_warehouse_sk" = "inv2"."w_warehouse_sk")
      AND ("inv1"."d_moy" = 1)
      AND ("inv2"."d_moy" = (1 + 1))
      AND ("inv1"."cov" > DECIMAL '1.5')
ORDER BY "inv1"."w_warehouse_sk" ASC, "inv1"."i_item_sk" ASC, "inv1"."d_moy" ASC, "inv1"."mean" AS
C, "inv1"."cov" ASC, "inv2"."d_moy" ASC, "inv2"."mean" ASC, "inv2"."cov" ASC

```

Results: completed in 1 sec

+++++

[]

SQL name: ./benchmark/tpcds/q40.sql...

=====

```

SELECT
  "w_state"
, "i_item_id"
, "sum"((CASE WHEN (CAST("d_date" AS DATE) < CAST('2000-03-11' AS DATE)) THEN ("cs_sales_price" - C
OALESCE("cr_refunded_cash", 0)) ELSE 0 END)) "sales_before"
, "sum"((CASE WHEN (CAST("d_date" AS DATE) >= CAST('2000-03-11' AS DATE)) THEN ("cs_sales_price" -
COALESCE("cr_refunded_cash", 0)) ELSE 0 END)) "sales_after"
FROM
  (tpcds.tiny.catalog_sales
LEFT JOIN tpcds.tiny.catalog_returns ON ("cs_order_number" = "cr_order_number")
  AND ("cs_item_sk" = "cr_item_sk"))
, tpcds.tiny.warehouse
, tpcds.tiny.item
, tpcds.tiny.date_dim
WHERE ("i_current_price" BETWEEN DECIMAL '0.99' AND DECIMAL '1.49')
      AND ("i_item_sk" = "cs_item_sk")
      AND ("cs_warehouse_sk" = "w_warehouse_sk")
      AND ("cs_sold_date_sk" = "d_date_sk")
      AND (CAST("d_date" AS DATE) BETWEEN (CAST('2000-03-11' AS DATE) - INTERVAL '30' DAY) AND (CAST
('2000-03-11' AS DATE) + INTERVAL '30' DAY))
GROUP BY "w_state", "i_item_id"
ORDER BY "w_state" ASC, "i_item_id" ASC
LIMIT 100

```

Results: completed in 2 sec

+++++

```
[('TN', 'AAAAAAAAABDAAAAA', '124.37', '143.42'), ('TN', 'AAAAAAAAAHAAAAA', '0.00', '-408.96'), ('TN', 'AAAAAAAAAJAAAAA', '18.77', '28.49'), ('TN', 'AAAAAAAAAPAAAAA', '0.00', '156.54'), ('TN', 'AAAAAAAAABKFAAAAA', '39.96', '0.00')]
```

SQL name: ./benchmark/tpcds/q41.sql...

=====

```
SELECT DISTINCT "i_product_name"
FROM
  tpcds.tiny.item i1
WHERE ("i_manufact_id" BETWEEN 738 AND (738 + 40))
  AND ((
    SELECT "count"(*) "item_cnt"
    FROM
      tpcds.tiny.item
    WHERE (("i_manufact" = "i1"."i_manufact")
      AND (((("i_category" = 'Women')
        AND (("i_color" = 'powder')
          OR ("i_color" = 'khaki'))
        AND (("i_units" = 'Ounce')
          OR ("i_units" = 'Oz'))
        AND (("i_size" = 'medium')
          OR ("i_size" = 'extra large'))))
      OR ((("i_category" = 'Women')
        AND (("i_color" = 'brown')
          OR ("i_color" = 'honeydew'))
        AND (("i_units" = 'Bunch')
          OR ("i_units" = 'Ton'))
        AND (("i_size" = 'N/A')
          OR ("i_size" = 'small'))))
      OR ((("i_category" = 'Men')
        AND (("i_color" = 'floral')
          OR ("i_color" = 'deep'))
        AND (("i_units" = 'N/A')
          OR ("i_units" = 'Dozen'))
        AND (("i_size" = 'petite')
          OR ("i_size" = 'large'))))
      OR ((("i_category" = 'Men')
```

```

        AND (("i_color" = 'light')
            OR ("i_color" = 'cornflower'))
        AND (("i_units" = 'Box')
            OR ("i_units" = 'Pound'))
        AND (("i_size" = 'medium')
            OR ("i_size" = 'extra large')))))
OR (("i_manufact" = "il"."i_manufact")
    AND (((("i_category" = 'Women')
        AND (("i_color" = 'midnight')
            OR ("i_color" = 'snow'))
        AND (("i_units" = 'Pallet')
            OR ("i_units" = 'Gross'))
        AND (("i_size" = 'medium')
            OR ("i_size" = 'extra large'))))
    OR (("i_category" = 'Women')
        AND (("i_color" = 'cyan')
            OR ("i_color" = 'papaya'))
        AND (("i_units" = 'Cup')
            OR ("i_units" = 'Dram'))
        AND (("i_size" = 'N/A')
            OR ("i_size" = 'small'))))
    OR (("i_category" = 'Men')
        AND (("i_color" = 'orange')
            OR ("i_color" = 'frosted'))
        AND (("i_units" = 'Each')
            OR ("i_units" = 'Tbl'))
        AND (("i_size" = 'petite')
            OR ("i_size" = 'large'))))
    OR (("i_category" = 'Men')
        AND (("i_color" = 'forest')
            OR ("i_color" = 'ghost'))
        AND (("i_units" = 'Lb')
            OR ("i_units" = 'Bundle'))
        AND (("i_size" = 'medium')
            OR ("i_size" = 'extra large'))))))
) > 0)
ORDER BY "i_product_name" ASC
LIMIT 100

```

Results: completed in 1 sec



```
+++++
[]
```

SQL name: ./benchmark/tpcds/q42.sql...

=====

```
SELECT
  "dt"."d_year"
, "item"."i_category_id"
, "item"."i_category"
, "sum"("ss_ext_sales_price")
FROM
  tpcds.tiny.date_dim dt
, tpcds.tiny.store_sales
, tpcds.tiny.item
WHERE ("dt"."d_date_sk" = "store_sales"."ss_sold_date_sk")
  AND ("store_sales"."ss_item_sk" = "item"."i_item_sk")
  AND ("item"."i_manager_id" = 1)
  AND ("dt"."d_moy" = 11)
  AND ("dt"."d_year" = 2000)
GROUP BY "dt"."d_year", "item"."i_category_id", "item"."i_category"
ORDER BY "sum"("ss_ext_sales_price") DESC, "dt"."d_year" ASC, "item"."i_category_id" ASC, "item"."i_category" ASC
LIMIT 100
```

Results: completed in 2 sec

+++++

```
[(2000, 1, 'Women', '50707.28'), (2000, 7, 'Home', '28624.33'), (2000, 10, 'Electronics', '2872.17'), (2000, 4, 'Shoes', '44360.34')]
```

SQL name: ./benchmark/tpcds/q43.sql...

=====

```
SELECT
  "s_store_name"
, "s_store_id"
, "sum"((CASE WHEN ("d_day_name" = 'Sunday') THEN "ss_sales_price" ELSE null END)) "sun_sales"
, "sum"((CASE WHEN ("d_day_name" = 'Monday') THEN "ss_sales_price" ELSE null END)) "mon_sales"
, "sum"((CASE WHEN ("d_day_name" = 'Tuesday') THEN "ss_sales_price" ELSE null END)) "tue_sales"
, "sum"((CASE WHEN ("d_day_name" = 'Wednesday') THEN "ss_sales_price" ELSE null END)) "wed_sales"
```



```

, "sum"((CASE WHEN ("d_day_name" = 'Thursday') THEN "ss_sales_price" ELSE null END)) "thu_sales"
, "sum"((CASE WHEN ("d_day_name" = 'Friday') THEN "ss_sales_price" ELSE null END)) "fri_sales"
, "sum"((CASE WHEN ("d_day_name" = 'Saturday') THEN "ss_sales_price" ELSE null END)) "sat_sales"
FROM
  tpcds.tiny.date_dim
, tpcds.tiny.store_sales
, tpcds.tiny.store
WHERE ("d_date_sk" = "ss_sold_date_sk")
  AND ("s_store_sk" = "ss_store_sk")
  AND ("s_gmt_offset" = -5)
  AND ("d_year" = 2000)
GROUP BY "s_store_name", "s_store_id"
ORDER BY "s_store_name" ASC, "s_store_id" ASC, "sun_sales" ASC, "mon_sales" ASC, "tue_sales" ASC,
"wed_sales" ASC, "thu_sales" ASC, "fri_sales" ASC, "sat_sales" ASC
LIMIT 100

```

Results: completed in 2 sec

+++++

```

[('able', 'AAAAAAAACAAAAAA', '69625.04', '49173.57', '51831.91', '57612.82', '58895.09', '68174.
93', '63674.96'), ('ought', 'AAAAAAAABAAAAAA', '67834.24', '71407.56', '53404.80', '60268.27',
'62419.41', '64721.89', '58482.27')]

```

SQL name: ./benchmark/tpcds/q44.sql...

=====

```

SELECT
  "asceding"."rnk"
, "i1"."i_product_name" "best_performing"
, "i2"."i_product_name" "worst_performing"
FROM
  (
    SELECT *
    FROM
      (
        SELECT
          "item_sk"
        , "rank"() OVER (ORDER BY "rank_col" ASC) "rnk"
        FROM
          (
            SELECT
              "ss_item_sk" "item_sk"

```

```

        , "avg"("ss_net_profit") "rank_col"
      FROM
        tpcds.tiny.store_sales ss1
      WHERE ("ss_store_sk" = 4)
      GROUP BY "ss_item_sk"
      HAVING ("avg"("ss_net_profit") > (DECIMAL '0.9' * (
        SELECT "avg"("ss_net_profit") "rank_col"
        FROM
          tpcds.tiny.store_sales
        WHERE ("ss_store_sk" = 4)
          AND ("ss_addr_sk" IS NULL)
        GROUP BY "ss_store_sk"
      )))
    ) v1
  ) v11
  WHERE ("rnk" < 11)
) ascending
, (
  SELECT *
  FROM
    (
      SELECT
        "item_sk"
      , "rank"() OVER (ORDER BY "rank_col" DESC) "rnk"
      FROM
        (
          SELECT
            "ss_item_sk" "item_sk"
          , "avg"("ss_net_profit") "rank_col"
          FROM
            tpcds.tiny.store_sales ss1
          WHERE ("ss_store_sk" = 4)
          GROUP BY "ss_item_sk"
          HAVING ("avg"("ss_net_profit") > (DECIMAL '0.9' * (
            SELECT "avg"("ss_net_profit") "rank_col"
            FROM
              tpcds.tiny.store_sales
            WHERE ("ss_store_sk" = 4)
              AND ("ss_addr_sk" IS NULL)
            GROUP BY "ss_store_sk"
          )))
        )
    )
  ) v2
) v21

```

```

        WHERE ("rnk" < 11)
    ) descending
    , tpcds.tiny.item i1
    , tpcds.tiny.item i2
WHERE ("ascending"."rnk" = "descending"."rnk")
    AND ("i1"."i_item_sk" = "ascending"."item_sk")
    AND ("i2"."i_item_sk" = "descending"."item_sk")
ORDER BY "ascending"."rnk" ASC
LIMIT 100

```

Results: completed in 2 sec

```

+++++
[]

```

SQL name: ./benchmark/tpcds/q45.sql...

=====

```

SELECT
    "ca_zip"
    , "ca_city"
    , "sum"("ws_sales_price")
FROM
    tpcds.tiny.web_sales
    , tpcds.tiny.customer
    , tpcds.tiny.customer_address
    , tpcds.tiny.date_dim
    , tpcds.tiny.item
WHERE ("ws_bill_customer_sk" = "c_customer_sk")
    AND ("c_current_addr_sk" = "ca_address_sk")
    AND ("ws_item_sk" = "i_item_sk")
    AND (("substr"("ca_zip", 1, 5) IN ('85669'      , '86197'      , '88274'      , '83405'      , '86475'      ,
'85392'      , '85460'      , '80348'      , '81792'))
        OR ("i_item_id" IN (
            SELECT "i_item_id"
            FROM
                tpcds.tiny.item
            WHERE ("i_item_sk" IN (2          , 3          , 5          , 7          , 11          , 13          , 17          , 19
, 23          , 29)))
        )))
    AND ("ws_sold_date_sk" = "d_date_sk")
    AND ("d_qoy" = 2)

```

```
    AND ("d_year" = 2001)
GROUP BY "ca_zip", "ca_city"
ORDER BY "ca_zip" ASC, "ca_city" ASC
LIMIT 100
```

Results: completed in 1 sec

```
+++++
[('68339      ', 'Whitney', '43.34'), ('70534      ', 'Crossroads', '9.18'), ('71952      ', 'Sunnys
ide', '32.84'), ('80059      ', 'Centerville', '7.06'), ('83003      ', 'Hillcrest', '79.87')]
```

SQL name: ./benchmark/tpcds/q46.sql...

```
=====
SELECT
  "c_last_name"
, "c_first_name"
, "ca_city"
, "bought_city"
, "ss_ticket_number"
, "amt"
, "profit"
FROM
  (
    SELECT
      "ss_ticket_number"
    , "ss_customer_sk"
    , "ca_city" "bought_city"
    , "sum"("ss_coupon_amt") "amt"
    , "sum"("ss_net_profit") "profit"
    FROM
      tpcds.tiny.store_sales
    , tpcds.tiny.date_dim
    , tpcds.tiny.store
    , tpcds.tiny.household_demographics
    , tpcds.tiny.customer_address
    WHERE ("store_sales"."ss_sold_date_sk" = "date_dim"."d_date_sk")
      AND ("store_sales"."ss_store_sk" = "store"."s_store_sk")
      AND ("store_sales"."ss_hdemo_sk" = "household_demographics"."hd_demo_sk")
      AND ("store_sales"."ss_addr_sk" = "customer_address"."ca_address_sk")
      AND (("household_demographics"."hd_dep_count" = 4)
        OR ("household_demographics"."hd_vehicle_count" = 3))
  )
```

```

        AND ("date_dim"."d_dow" IN (6 , 0))
        AND ("date_dim"."d_year" IN (1999 , (1999 + 1) , (1999 + 2)))
        AND ("store"."s_city" IN ('Fairview' , 'Midway' , 'Fairview' , 'Fairview' , 'Fairvi
ew'))
    GROUP BY "ss_ticket_number", "ss_customer_sk", "ss_addr_sk", "ca_city"
) dn
, tpcds.tiny.customer
, tpcds.tiny.customer_address current_addr
WHERE ("ss_customer_sk" = "c_customer_sk")
    AND ("customer"."c_current_addr_sk" = "current_addr"."ca_address_sk")
    AND ("current_addr"."ca_city" <> "bought_city")
ORDER BY "c_last_name" ASC, "c_first_name" ASC, "ca_city" ASC, "bought_city" ASC, "ss_ticket_numbe
er" ASC
LIMIT 100

```

Results: completed in 2 sec

```

+++++
[('Adams', 'Catherine', 'Riverdale', 'Summit', 2987, '1600.7
9', '-15133.13'), ('Adams', 'Chris', 'Spring Hill', 'Fair
field', 3922, '0.00', '-12338.60'), ('Adams', 'Chris', 'S
pring Hill', 'Lakeview', 114, '286.99', '-12862.22'), ('Albert', 'John', 'E
', 'Wildwood', 'Mount Zion', 7114, '2368.73', '-13170.27'), ('Aldridge', 'E
ugene', 'Bethel', 'Tanglewood', 8212, '3006.79', '-10788.48')]

```

SQL name: ./benchmark/tpcds/q47.sql...

=====

```

WITH
  v1 AS (
    SELECT
      "i_category"
    , "i_brand"
    , "s_store_name"
    , "s_company_name"
    , "d_year"
    , "d_moy"
    , "sum"("ss_sales_price") "sum_sales"
    , "avg"("sum"("ss_sales_price")) OVER (PARTITION BY "i_category", "i_brand", "s_store_name",
"s_company_name", "d_year") "avg_monthly_sales"
    , "rank"() OVER (PARTITION BY "i_category", "i_brand", "s_store_name", "s_company_name" ORDER
BY "d_year" ASC, "d_moy" ASC) "rn"

```

```

FROM
    tpcds.tiny.item
  , tpcds.tiny.store_sales
  , tpcds.tiny.date_dim
  , tpcds.tiny.store
WHERE ("ss_item_sk" = "i_item_sk")
    AND ("ss_sold_date_sk" = "d_date_sk")
    AND ("ss_store_sk" = "s_store_sk")
    AND (("d_year" = 1999)
        OR (("d_year" = (1999 - 1))
            AND ("d_moy" = 12))
        OR (("d_year" = (1999 + 1))
            AND ("d_moy" = 1)))
GROUP BY "i_category", "i_brand", "s_store_name", "s_company_name", "d_year", "d_moy"
)
, v2 AS (
    SELECT
        "v1"."i_category"
      , "v1"."i_brand"
      , "v1"."s_store_name"
      , "v1"."s_company_name"
      , "v1"."d_year"
      , "v1"."d_moy"
      , "v1"."avg_monthly_sales"
      , "v1"."sum_sales"
      , "v1_lag"."sum_sales" "psum"
      , "v1_lead"."sum_sales" "nsum"
    FROM
        v1
      , v1 v1_lag
      , v1 v1_lead
    WHERE ("v1"."i_category" = "v1_lag"."i_category")
        AND ("v1"."i_category" = "v1_lead"."i_category")
        AND ("v1"."i_brand" = "v1_lag"."i_brand")
        AND ("v1"."i_brand" = "v1_lead"."i_brand")
        AND ("v1"."s_store_name" = "v1_lag"."s_store_name")
        AND ("v1"."s_store_name" = "v1_lead"."s_store_name")
        AND ("v1"."s_company_name" = "v1_lag"."s_company_name")
        AND ("v1"."s_company_name" = "v1_lead"."s_company_name")
        AND ("v1"."rn" = ("v1_lag"."rn" + 1))
        AND ("v1"."rn" = ("v1_lead"."rn" - 1))
    )
SELECT *

```

```

FROM
  v2
WHERE ("d_year" = 1999)
  AND ("avg_monthly_sales" > 0)
  AND ((CASE WHEN ("avg_monthly_sales" > 0) THEN ("abs"("sum_sales" - "avg_monthly_sales")) /
"avg_monthly_sales") ELSE null END) > DECIMAL '0.1')
ORDER BY ("sum_sales" - "avg_monthly_sales") ASC, 3 ASC
LIMIT 100

```

Results: completed in 2 sec

+++++

```

[('Shoes', 'able', 'Unknown', 1999, 6, '829.93', '165.07', '354.24', '253.10'), ('Shoes', 'exportiedu pack #1', 'ought', 'Unknown', 1999, 2, '867.68', '278.18', '697.15', '37.06'), ('Shoes', 'able', 'Unknown', 1999, 7, '829.93', '253.10', '165.07', '1819.85'), ('Children', 'exportiexporti #1', 'ought', 'Unknown', 1999, 5, '583.45', '21.45', '600.74', '336.73')]

```

SQL name: ./benchmark/tpcds/q48.sql...

=====

```

SELECT "sum"("ss_quantity")
FROM
  tpcds.tiny.store_sales
, tpcds.tiny.store
, tpcds.tiny.customer_demographics
, tpcds.tiny.customer_address
, tpcds.tiny.date_dim
WHERE ("s_store_sk" = "ss_store_sk")
  AND ("ss_sold_date_sk" = "d_date_sk")
  AND ("d_year" = 2000)
  AND (("cd_demo_sk" = "ss_cdemo_sk")
    AND ("cd_marital_status" = 'M')
    AND ("cd_education_status" = '4 yr Degree')
    AND ("ss_sales_price" BETWEEN DECIMAL '100.00' AND DECIMAL '150.00'))
  OR ("cd_demo_sk" = "ss_cdemo_sk")
    AND ("cd_marital_status" = 'D')
    AND ("cd_education_status" = '2 yr Degree')

```

```

        AND ("ss_sales_price" BETWEEN DECIMAL '50.00' AND DECIMAL '100.00'))
    OR (("cd_demo_sk" = "ss_cdemo_sk")
        AND ("cd_marital_status" = 'S')
        AND ("cd_education_status" = 'College')
        AND ("ss_sales_price" BETWEEN DECIMAL '150.00' AND DECIMAL '200.00'))))
    AND (((("ss_addr_sk" = "ca_address_sk")
        AND ("ca_country" = 'United States')
        AND ("ca_state" IN ('CO' , 'OH' , 'TX'))
        AND ("ss_net_profit" BETWEEN 0 AND 2000))
    OR (("ss_addr_sk" = "ca_address_sk")
        AND ("ca_country" = 'United States')
        AND ("ca_state" IN ('OR' , 'MN' , 'KY'))
        AND ("ss_net_profit" BETWEEN 150 AND 3000))
    OR (("ss_addr_sk" = "ca_address_sk")
        AND ("ca_country" = 'United States')
        AND ("ca_state" IN ('VA' , 'CA' , 'MS'))
        AND ("ss_net_profit" BETWEEN 50 AND 25000)))

```

Traceback (most recent call last):

```

  File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.py",
line 955, in fetchone
    row = dbapi_cursor.fetchone()
  File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 106,
in fetchone
    self._fetch_while(lambda: not self._data and self._state != self._STATE_FINISHED)
  File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 46, i
n _fetch_while
    self._fetch_more()
  File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 308,
in _fetch_more
    self._process_response(self._requests_session.get(self._nextUri, **self._requests_kwargs))
  File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 349,
in _process_response
    raise DatabaseError(response_json['error'])
pyhive.exc.DatabaseError: {'message': 'Query exceeded per-node user memory limit of 102.40MB [Alloc
ated: 101.84MB, Delta: 1.10MB, Top Consumers: {HashBuilderOperator=101.84MB, PartitionedOutputOpera
tor=3.24MB, ScanFilterAndProjectOperator=1.26MB}, Details: [{"taskId":"3.0.0","reservation":"95.78M
B","topConsumers":[{"type":"HashBuilderOperator","planNodeId":"108","reservations":["6.14MB","6.14M
B","6.13MB","6.13MB","6.13MB","6.13MB","6.13MB","6.13MB","6.12MB","6.12MB","6.12MB","6.12MB","6.12M
B","6.11MB","5.02MB","5.01MB"],"total":"95.78MB","info":"INNER;PARTITIONED;"}]},{taskId":"4.0.
0","reservation":"3.99MB","topConsumers":[{"type":"HashBuilderOperator","planNodeId":"116","reserva

```



```
tions":["128.40kB","128.40kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB"],"total":"2.00MB","info":{"INNER;PARTITIONED;"}},{ "type": "PartitionedOutputOperator", "planNodeId": "926", "reservations":["1.05MB","478.81kB","478.81kB","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B"],"total":"1.99MB"}, {"type": "FilterAndProjectOperator", "planNodeId": "926", "reservations":["944B","944B","944B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B"],"total":"2.77kB"}]]}, {"taskId": "5.0.0", "reservation": "2.50MB", "topConsumers": [{"type": "ScanFilterAndProjectOperator", "planNodeId": "924", "reservations": ["1.25MB"], "total": "1.25MB"}, {"type": "PartitionedOutputOperator", "planNodeId": "924", "reservations": ["1.25MB"], "total": "1.25MB"}]}]]}', 'errorCode': 131079, 'errorMessage': 'EXCEEDED_LOCAL_MEMORY_LIMIT', 'errorType': 'INSUFFICIENT_RESOURCES', 'boolean': False, 'failureInfo': {'type': 'com.facebook.presto.ExceededMemoryLimitException', 'message': 'Query exceeded per-node user memory limit of 102.40MB [Allocated: 101.84MB, Delta: 1.10MB, Top Consumers: {HashBuilderOperator=101.84MB, PartitionedOutputOperator=3.24MB, ScanFilterAndProjectOperator=1.26MB}, Details: [{"taskId": "3.0.0", "reservation": "95.78MB", "topConsumers": [{"type": "HashBuilderOperator", "planNodeId": "108", "reservations": ["6.14MB", "6.14MB", "6.13MB", "6.13MB", "6.13MB", "6.13MB", "6.13MB", "6.13MB", "6.12MB", "6.12MB", "6.12MB", "6.12MB", "6.12MB", "6.11MB", "5.02MB", "5.01MB"], "total": "95.78MB", "info": "INNER;PARTITIONED;"}]}], {"taskId": "4.0.0", "reservation": "3.99MB", "topConsumers": [{"type": "HashBuilderOperator", "planNodeId": "116", "reservations": ["128.40kB", "128.40kB", "128.26kB", "128.26kB", "128.26kB", "128.26kB", "128.26kB", "128.26kB", "128.26kB", "128.26kB", "128.26kB", "128.26kB", "128.26kB", "128.26kB", "128.26kB", "128.26kB"], "total": "2.00MB", "info": "INNER;PARTITIONED;"}], {"type": "PartitionedOutputOperator", "planNodeId": "926", "reservations": ["1.05MB", "478.81kB", "478.81kB", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B"], "total": "1.99MB"}, {"type": "FilterAndProjectOperator", "planNodeId": "926", "reservations": ["944B", "944B", "944B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B"], "total": "2.77kB"}]}], {"taskId": "5.0.0", "reservation": "2.50MB", "topConsumers": [{"type": "ScanFilterAndProjectOperator", "planNodeId": "924", "reservations": ["1.25MB"], "total": "1.25MB"}, {"type": "PartitionedOutputOperator", "planNodeId": "924", "reservations": ["1.25MB"], "total": "1.25MB"}]}]]]', 'suppressed': [], 'stack': ['com.facebook.presto.ExceededMemoryLimitException.exceededLocalUserMemoryLimit(ExceededMemoryLimitException.java:49)', 'com.facebook.presto.memory.QueryContext.enforceUserMemoryLimit(QueryContext.java:496)', 'com.facebook.presto.memory.QueryContext.updateUserMemory(QueryContext.java:192)', 'com.facebook.presto.memory.QueryContext$QueryMemoryReservationHandler.reserveMemory(QueryContext.java:462)', 'com.facebook.presto.memory.context.RootAggregatedMemoryContext.updateBytes(RootAggregatedMemoryContext.java:37)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.SimpleLocalMemoryContext.setBytes(SimpleLocalMemoryContext.java:82)', 'com.facebook.presto.operator.OperatorContext$InternalLocalMemoryContext.setBytes(OperatorContext.java:672)', 'com.facebook.presto.operator.HashBuilderOperator.finishInput(HashBuilderOperator.java:503)', 'com.facebook.presto.operator.HashBuilderOperator.finish(HashBuilderOperator.java:454)', 'com.facebook.presto.operator.Driver.processInternal(Driver.java:441)', 'com.facebook.presto.operator.Driver.lambda$processFor$9(Driver.java:301)', 'com.facebook.presto.operator.Driver.tryWithLock(Driver.java:722)', 'com.facebook.presto.operator.Drive
```

```
r.processFor(Driver.java:294)', 'com.facebook.presto.execution.SqlTaskExecution$DriverSplitRunner.p  
rocessFor(SqlTaskExecution.java:1077)', 'com.facebook.presto.execution.executor.PrioritizedSplitRun  
ner.process(PrioritizedSplitRunner.java:162)', 'com.facebook.presto.execution.executor.TaskExecuto  
r$TaskRunner.run(TaskExecutor.java:599)', 'com.facebook.presto.$gen.Presto_0_263_b9fd4d4____20211010  
_164639_1.run(Unknown Source)', 'java.base/java.util.concurrent.ThreadPoolExecutor.runWorker(Thread  
PoolExecutor.java:1128)', 'java.base/java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolE  
xecutor.java:628)', 'java.base/java.lang.Thread.run(Thread.java:829)']}]}
```

The above exception was the direct cause of the following exception:

Traceback (most recent call last):

```
File "/tmp/ipykernel_394536/722970930.py", line 15, in <module>
    for row in rs:
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/result.py",
line 381, in iterrows
    for row in self._fetchiter_impl():
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.py",
line 1788, in _fetchiter_impl
    row = fetchone(self, self.cursor)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.py",
line 960, in fetchone
    self.handle_exception(result, dbapi_cursor, e)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.py",
line 941, in handle_exception
    result.connection._handle_dbapi_exception(
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py", l
ine 2023, in _handle_dbapi_exception
    util.raise_(
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/util/compat.py", l
ine 207, in raise_
    raise exception
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.py",
line 955, in fetchone
    row = dbapi_cursor.fetchone()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 106,
in fetchone
    self._fetch_while(lambda: not self._data and self._state != self._STATE_FINISHED)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 46, i
n _fetch_while
    self._fetch_more()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 308,
in _fetch_more
    self._process_response(self._requests_session.get(self._nextUri, **self._requests_kwargs))
```

```
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 349,
in _process_response
    raise DatabaseError(response_json['error'])
sqlalchemy.exc.DatabaseError: (pyhive.exc.DatabaseError) {'message': 'Query exceeded per-node user
memory limit of 102.40MB [Allocated: 101.84MB, Delta: 1.10MB, Top Consumers: {HashBuilderOperator=1
01.84MB, PartitionedOutputOperator=3.24MB, ScanFilterAndProjectOperator=1.26MB}, Details: [{"taskI
d":"3.0.0","reservation":"95.78MB","topConsumers":[{"type":"HashBuilderOperator","planNodeId":"10
8","reservations":["6.14MB","6.14MB","6.13MB","6.13MB","6.13MB","6.13MB","6.13MB","6.13MB","6.12M
B","6.12MB","6.12MB","6.12MB","6.12MB","6.11MB","5.02MB","5.01MB"],"total":"95.78MB","info":"INNER;
PARTITIONED;"}]},{ "taskId":"4.0.0","reservation":"3.99MB","topConsumers":[{"type":"HashBuilderOpera
tor","planNodeId":"116","reservations":["128.40kB","128.40kB","128.26kB","128.26kB","128.26kB","12
8.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","12
8.26kB","128.26kB"],"total":"2.00MB","info":"INNER;PARTITIONED;"}]},{ "type":"PartitionedOutputOperato
r","planNodeId":"926","reservations":["1.05MB","478.81kB","478.81kB","0B","0B","0B","0B","0B","0
B","0B","0B","0B","0B","0B","0B","0B","0B","0B"],"total":"1.99MB"}]},{ "type":"FilterAndProjectOperator","planNo
deId":"926","reservations":["944B","944B","944B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0
B","0B","0B","0B"],"total":"2.77kB"}]},{ "taskId":"5.0.0","reservation":"2.50MB","topConsumers":[{"t
ype":"ScanFilterAndProjectOperator","planNodeId":"924","reservations":["1.25MB"],"total":"1.25MB"},
{"type":"PartitionedOutputOperator","planNodeId":"924","reservations":["1.25MB"],"total":"1.25M
B"}]}}]','errorCode': 131079, 'errorName': 'EXCEEDED_LOCAL_MEMORY_LIMIT', 'errorType': 'INSUFFICIE
NT_RESOURCES', 'boolean': False, 'failureInfo': {'type': 'com.facebook.presto.ExceededMemoryLimitEx
ception', 'message': 'Query exceeded per-node user memory limit of 102.40MB [Allocated: 101.84MB, D
elta: 1.10MB, Top Consumers: {HashBuilderOperator=101.84MB, PartitionedOutputOperator=3.24MB, ScanF
ilterAndProjectOperator=1.26MB}, Details: [{"taskId":"3.0.0","reservation":"95.78MB","topConsumer
s":[{"type":"HashBuilderOperator","planNodeId":"108","reservations":["6.14MB","6.14MB","6.13MB","6.
13MB","6.13MB","6.13MB","6.13MB","6.13MB","6.12MB","6.12MB","6.12MB","6.12MB","6.12MB","6.12MB","6.11MB","5.
02MB","5.01MB"],"total":"95.78MB","info":"INNER;PARTITIONED;"}]},{ "taskId":"4.0.0","reservatio
n":"3.99MB","topConsumers":[{"type":"HashBuilderOperator","planNodeId":"116","reservations":["128.4
0kB","128.40kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.2
6kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB","128.26kB"],"total":"2.00MB","info":"IN
NER;PARTITIONED;"}]},{ "type":"PartitionedOutputOperator","planNodeId":"926","reservations":["1.05M
B","478.81kB","478.81kB","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B"],"tota
l":"1.99MB"}]},{ "type":"FilterAndProjectOperator","planNodeId":"926","reservations":["944B","944B","9
44B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B","0B"],"total":"2.77kB"}]},{ "taskI
d":"5.0.0","reservation":"2.50MB","topConsumers":[{"type":"ScanFilterAndProjectOperator","planNodeI
d":"924","reservations":["1.25MB"],"total":"1.25MB"}, {"type":"PartitionedOutputOperator","planNodeI
d":"924","reservations":["1.25MB"],"total":"1.25MB"}]}}]','suppressed': [], 'stack': ['com.faceboo
k.presto.ExceededMemoryLimitException.exceededLocalUserMemoryLimit(ExceededMemoryLimitException.jav
a:49)', 'com.facebook.presto.memory.QueryContext.enforceUserMemoryLimit(QueryContext.java:496)', 'c
om.facebook.presto.memory.QueryContext.updateUserMemory(QueryContext.java:192)', 'com.facebook.pres
to.memory.QueryContext$QueryMemoryReservationHandler.reserveMemory(QueryContext.java:462)', 'com.fa
cebook.presto.memory.context.RootAggregatedMemoryContext.updateBytes(RootAggregatedMemoryContext.ja
va:37)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregat
```

```
edMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.SimpleLocalMemoryContext.setBytes(SimpleLocalMemoryContext.java:82)', 'com.facebook.presto.operator.OperatorContext$InternalLocalMemoryContext.setBytes(OperatorContext.java:672)', 'com.facebook.presto.operator.HashBuilderOperator.finishInput(HashBuilderOperator.java:503)', 'com.facebook.presto.operator.HashBuilderOperator.finish(HashBuilderOperator.java:454)', 'com.facebook.presto.operator.Driver.processInternal(Driver.java:441)', 'com.facebook.presto.operator.Driver.lambda$a$processFor$9(Driver.java:301)', 'com.facebook.presto.operator.Driver.tryWithLock(Driver.java:722)', 'com.facebook.presto.operator.Driver.processFor(Driver.java:294)', 'com.facebook.presto.execution.SqlTaskExecution$DriverSplitRunner.processFor(SqlTaskExecution.java:1077)', 'com.facebook.presto.execution.executor.PrioritizedSplitRunner.process(PrioritizedSplitRunner.java:162)', 'com.facebook.presto.execution.executor.TaskExecutor$TaskRunner.run(TaskExecutor.java:599)', 'com.facebook.presto.$gen.Presto_0_263_b9fd4d4_20211010_164639_1.run(Unknown Source)', 'java.base/java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1128)', 'java.base/java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:628)', 'java.base/java.lang.Thread.run(Thread.java:829)']}]}
```

(Background on this error at: <https://sqlalche.me/e/14/4xp6>) (<https://sqlalche.me/e/14/4xp6>)

SQL name: ./benchmark/tpcds/q49.sql...

=====

```
SELECT
  'web' "channel"
, "web"."item"
, "web"."return_ratio"
, "web"."return_rank"
, "web"."currency_rank"
FROM
  (
    SELECT
      "item"
    , "return_ratio"
    , "currency_ratio"
    , "rank"() OVER (ORDER BY "return_ratio" ASC) "return_rank"
    , "rank"() OVER (ORDER BY "currency_ratio" ASC) "currency_rank"
    FROM
      (
        SELECT
          "ws"."ws_item_sk" "item"
        , (CAST("sum"(COALESCE("wr"."wr_return_quantity", 0)) AS DECIMAL(15,4)) / CAST("sum"(COALESCE
```

```

("ws"."ws_quantity", 0)) AS DECIMAL(15,4))) "return_ratio"
, (CAST("sum"(COALESCE("wr"."wr_return_amt", 0)) AS DECIMAL(15,4)) / CAST("sum"(COALESCE("w
s"."ws_net_paid", 0)) AS DECIMAL(15,4))) "currency_ratio"
FROM
    (tpcds.tiny.web_sales ws
    LEFT JOIN tpcds.tiny.web_returns wr ON ("ws"."ws_order_number" = "wr"."wr_order_number")
        AND ("ws"."ws_item_sk" = "wr"."wr_item_sk"))
    , tpcds.tiny.date_dim
WHERE ("wr"."wr_return_amt" > 10000)
    AND ("ws"."ws_net_profit" > 1)
    AND ("ws"."ws_net_paid" > 0)
    AND ("ws"."ws_quantity" > 0)
    AND ("ws_sold_date_sk" = "d_date_sk")
    AND ("d_year" = 2001)
    AND ("d_moy" = 12)
GROUP BY "ws"."ws_item_sk"
) in_web
) web
WHERE ("web"."return_rank" <= 10)
    OR ("web"."currency_rank" <= 10)
UNION SELECT
    'catalog' "channel"
    , "catalog"."item"
    , "catalog"."return_ratio"
    , "catalog"."return_rank"
    , "catalog"."currency_rank"
FROM
    (
        SELECT
            "item"
            , "return_ratio"
            , "currency_ratio"
            , "rank"() OVER (ORDER BY "return_ratio" ASC) "return_rank"
            , "rank"() OVER (ORDER BY "currency_ratio" ASC) "currency_rank"
        FROM
            (
                SELECT
                    "cs"."cs_item_sk" "item"
                    , (CAST("sum"(COALESCE("cr"."cr_return_quantity", 0)) AS DECIMAL(15,4)) / CAST("sum"(COALESCE
("cs"."cs_quantity", 0)) AS DECIMAL(15,4))) "return_ratio"
                    , (CAST("sum"(COALESCE("cr"."cr_return_amount", 0)) AS DECIMAL(15,4)) / CAST("sum"(COALESCE
("cs"."cs_net_paid", 0)) AS DECIMAL(15,4))) "currency_ratio"
                FROM

```

```

        (tpcds.tiny.catalog_sales cs
LEFT JOIN tpcds.tiny.catalog_returns cr ON ("cs"."cs_order_number" = "cr"."cr_order_number")
        AND ("cs"."cs_item_sk" = "cr"."cr_item_sk"))
    , tpcds.tiny.date_dim
WHERE ("cr"."cr_return_amount" > 10000)
        AND ("cs"."cs_net_profit" > 1)
        AND ("cs"."cs_net_paid" > 0)
        AND ("cs"."cs_quantity" > 0)
        AND ("cs_sold_date_sk" = "d_date_sk")
        AND ("d_year" = 2001)
        AND ("d_moy" = 12)
    GROUP BY "cs"."cs_item_sk"
    ) in_cat
) "CATALOG"
WHERE ("catalog"."return_rank" <= 10)
    OR ("catalog"."currency_rank" <= 10)
UNION SELECT
    'tpcds.tiny.store' "channel"
    , "store"."item"
    , "store"."return_ratio"
    , "store"."return_rank"
    , "store"."currency_rank"
FROM
    (
        SELECT
            "item"
            , "return_ratio"
            , "currency_ratio"
            , "rank"() OVER (ORDER BY "return_ratio" ASC) "return_rank"
            , "rank"() OVER (ORDER BY "currency_ratio" ASC) "currency_rank"
        FROM
            (
                SELECT
                    "sts"."ss_item_sk" "item"
                    , (CAST("sum"(COALESCE("sr"."sr_return_quantity", 0)) AS DECIMAL(15,4)) / CAST("sum"(COALESCE(
("sts"."ss_quantity", 0)) AS DECIMAL(15,4))) "return_ratio"
                    , (CAST("sum"(COALESCE("sr"."sr_return_amt", 0)) AS DECIMAL(15,4)) / CAST("sum"(COALESCE("st
s"."ss_net_paid", 0)) AS DECIMAL(15,4))) "currency_ratio"
                FROM
                    (tpcds.tiny.store_sales sts
LEFT JOIN tpcds.tiny.store_returns sr ON ("sts"."ss_ticket_number" = "sr"."sr_ticket_number")
                    AND ("sts"."ss_item_sk" = "sr"."sr_item_sk"))
                , tpcds.tiny.date_dim

```

```

        WHERE ("sr"."sr_return_amt" > 10000)
            AND ("sts"."ss_net_profit" > 1)
            AND ("sts"."ss_net_paid" > 0)
            AND ("sts"."ss_quantity" > 0)
            AND ("ss_sold_date_sk" = "d_date_sk")
            AND ("d_year" = 2001)
            AND ("d_moy" = 12)
        GROUP BY "sts"."ss_item_sk"
    ) in_store
) store
WHERE ("store"."return_rank" <= 10)
    OR ("store"."currency_rank" <= 10)
ORDER BY 1 ASC, 4 ASC, 5 ASC, 2 ASC
LIMIT 100

```

Results: completed in 2 sec

+++++

```

[('catalog', 767, '1.0000', 1, 1), ('tpcds.tiny.store', 1841, '0.7750', 1, 1), ('tpcds.tiny.store',
737, '0.9420', 2, 2)]

```

SQL name: ./benchmark/tpcds/q50.sql...

=====

```

SELECT
    "s_store_name"
, "s_company_id"
, "s_street_number"
, "s_street_name"
, "s_street_type"
, "s_suite_number"
, "s_city"
, "s_county"
, "s_state"
, "s_zip"
, "sum"((CASE WHEN (("sr_returned_date_sk" - "ss_sold_date_sk") <= 30) THEN 1 ELSE 0 END)) "30 day
s"
, "sum"((CASE WHEN (("sr_returned_date_sk" - "ss_sold_date_sk") > 30)
    AND (("sr_returned_date_sk" - "ss_sold_date_sk") <= 60) THEN 1 ELSE 0 END)) "31-60 days"
, "sum"((CASE WHEN (("sr_returned_date_sk" - "ss_sold_date_sk") > 60)
    AND (("sr_returned_date_sk" - "ss_sold_date_sk") <= 90) THEN 1 ELSE 0 END)) "61-90 days"

```

```

, "sum"((CASE WHEN (("sr_returned_date_sk" - "ss_sold_date_sk") > 90)
AND (("sr_returned_date_sk" - "ss_sold_date_sk") <= 120) THEN 1 ELSE 0 END)) "91-120 days"
, "sum"((CASE WHEN (("sr_returned_date_sk" - "ss_sold_date_sk") > 120) THEN 1 ELSE 0 END)) ">120 da
ys"
FROM
tpcds.tiny.store_sales
, tpcds.tiny.store_returns
, tpcds.tiny.store
, tpcds.tiny.date_dim d1
, tpcds.tiny.date_dim d2
WHERE ("d2"."d_year" = 2001)
AND ("d2"."d_moy" = 8)
AND ("ss_ticket_number" = "sr_ticket_number")
AND ("ss_item_sk" = "sr_item_sk")
AND ("ss_sold_date_sk" = "d1"."d_date_sk")
AND ("sr_returned_date_sk" = "d2"."d_date_sk")
AND ("ss_customer_sk" = "sr_customer_sk")
AND ("ss_store_sk" = "s_store_sk")
GROUP BY "s_store_name", "s_company_id", "s_street_number", "s_street_name", "s_street_type", "s_su
ite_number", "s_city", "s_county", "s_state", "s_zip"
ORDER BY "s_store_name" ASC, "s_company_id" ASC, "s_street_number" ASC, "s_street_name" ASC, "s_str
eet_type" ASC, "s_suite_number" ASC, "s_city" ASC, "s_county" ASC, "s_state" ASC, "s_zip" ASC
LIMIT 100

```

Results: completed in 2 sec

+++++

```

[('able', 1, '255', 'Sycamore ', 'Dr. ', 'Suite 410 ', 'Midway', 'Williamson County', 'T
N', '31904 ', 9, 7, 3, 6, 16), ('ought', 1, '767', 'Spring ', 'Wy ', 'Suite 250 ',
'Midway', 'Williamson County', 'TN', '31904 ', 8, 9, 4, 6, 10)]

```

SQL name: ./benchmark/tpcds/q51.sql...

=====

WITH

```

web_v1 AS (
SELECT
"ws_item_sk" "item_sk"
, "d_date"
, "sum"("sum"("ws_sales_price")) OVER (PARTITION BY "ws_item_sk" ORDER BY "d_date" ASC ROWS BETW
EEN UNBOUNDED PRECEDING AND CURRENT ROW) "cume_sales"
FROM

```



```

        tpcds.tiny.web_sales
    , tpcds.tiny.date_dim
    WHERE ("ws_sold_date_sk" = "d_date_sk")
        AND ("d_month_seq" BETWEEN 1200 AND (1200 + 11))
        AND ("ws_item_sk" IS NOT NULL)
    GROUP BY "ws_item_sk", "d_date"
)
, store_v1 AS (
    SELECT
        "ss_item_sk" "item_sk"
    , "d_date"
    , "sum"("sum"("ss_sales_price")) OVER (PARTITION BY "ss_item_sk" ORDER BY "d_date" ASC ROWS BETWEEN UNBOUNDED PRECEDING AND CURRENT ROW) "cume_sales"
    FROM
        tpcds.tiny.store_sales
    , tpcds.tiny.date_dim
    WHERE ("ss_sold_date_sk" = "d_date_sk")
        AND ("d_month_seq" BETWEEN 1200 AND (1200 + 11))
        AND ("ss_item_sk" IS NOT NULL)
    GROUP BY "ss_item_sk", "d_date"
)
SELECT *
FROM
    (
        SELECT
            "item_sk"
        , "d_date"
        , "web_sales"
        , "store_sales"
        , "max"("web_sales") OVER (PARTITION BY "item_sk" ORDER BY "d_date" ASC ROWS BETWEEN UNBOUNDED PRECEDING AND CURRENT ROW) "web_cumulative"
        , "max"("store_sales") OVER (PARTITION BY "item_sk" ORDER BY "d_date" ASC ROWS BETWEEN UNBOUNDED PRECEDING AND CURRENT ROW) "store_cumulative"
        FROM
            (
                SELECT
                    (CASE WHEN ("web"."item_sk" IS NOT NULL) THEN "web"."item_sk" ELSE "store"."item_sk" END)
                "item_sk"
            , (CASE WHEN ("web"."d_date" IS NOT NULL) THEN "web"."d_date" ELSE "store"."d_date" END) "d_date"
            , "web"."cume_sales" "web_sales"
            , "store"."cume_sales" "store_sales"
            FROM

```

```

        (web_v1 web
FULL JOIN store_v1 store ON ("web"."item_sk" = "store"."item_sk")
        AND ("web"."d_date" = "store"."d_date"))
    ) x
) y
WHERE ("web_cumulative" > "store_cumulative")
ORDER BY "item_sk" ASC, "d_date" ASC
LIMIT 100

```

Results: completed in 2 sec

```

+++++
[(5, '2000-04-15', '114.20', None, '114.20', '79.51'), (5, '2000-05-01', None, '110.03', '114.20',
'110.03'), (11, '2000-02-16', '130.39', None, '130.39', '126.45'), (23, '2000-01-03', '29.57', '7.6
9', '29.57', '7.69'), (31, '2000-05-26', '49.63', None, '49.63', '30.94')]

```

SQL name: ./benchmark/tpcds/q52.sql...

```

=====
SELECT
    "dt"."d_year"
, "item"."i_brand_id" "brand_id"
, "item"."i_brand" "brand"
, "sum"("ss_ext_sales_price") "ext_price"
FROM
    tpcds.tiny.date_dim dt
, tpcds.tiny.store_sales
, tpcds.tiny.item
WHERE ("dt"."d_date_sk" = "store_sales"."ss_sold_date_sk")
    AND ("store_sales"."ss_item_sk" = "item"."i_item_sk")
    AND ("item"."i_manager_id" = 1)
    AND ("dt"."d_moy" = 11)
    AND ("dt"."d_year" = 2000)
GROUP BY "dt"."d_year", "item"."i_brand", "item"."i_brand_id"
ORDER BY "dt"."d_year" ASC, "ext_price" DESC, "brand_id" ASC
LIMIT 100

```

Results: completed in 2 sec

```

+++++
[(2000, 7008009, 'namelessbrand #9', '25825.18'), (2000, 1002002,

```

```
'importoamalg #2', '21693.31'), (2000, 1001002, 'amalgamalg #2', '14705.57'), (2000, 10004004, 'edu packunivamalg #4', '14449.16'), (2000, 7006007, 'edu packamalg #2', '14308.40')]
```

SQL name: ./benchmark/tpcds/q53.sql...

=====

```
SELECT *
FROM
(
  SELECT
    "i_manufact_id"
  , "sum"("ss_sales_price") "sum_sales"
  , "avg"("sum"("ss_sales_price")) OVER (PARTITION BY "i_manufact_id") "avg_quarterly_sales"
  FROM
    tpcds.tiny.item
  , tpcds.tiny.store_sales
  , tpcds.tiny.date_dim
  , tpcds.tiny.store
  WHERE ("ss_item_sk" = "i_item_sk")
    AND ("ss_sold_date_sk" = "d_date_sk")
    AND ("ss_store_sk" = "s_store_sk")
    AND ("d_month_seq" IN (1200 , (1200 + 1) , (1200 + 2) , (1200 + 3) , (1200 + 4) ,
(1200 + 5) , (1200 + 6) , (1200 + 7) , (1200 + 8) , (1200 + 9) , (1200 + 10) , (1200 +
11)))
    AND (((("i_category" IN ('Books' , 'Children' , 'Electronics'))
    AND ("i_class" IN ('personal' , 'portable' , 'reference' , 'sel
f-help'))
    AND ("i_brand" IN ('scholaramalgamalg #14' , 'scholaramalgamalg #7' ,
'exportiunivamalg #9' , 'scholaramalgamalg #9'))))
    OR ((("i_category" IN ('Women' , 'Music' , 'Men'))
    AND ("i_class" IN ('accessories' , 'classical' , 'fragrances' ,
'pants'))
    AND ("i_brand" IN ('amalgimporto #1' , 'edu packscholar #1' , 'exportii
importo #1' , 'importoamalg #1'))))
  GROUP BY "i_manufact_id", "d_qoy"
) tmp1
WHERE ((CASE WHEN ("avg_quarterly_sales" > 0) THEN ("abs"((CAST("sum_sales" AS DECIMAL(38,4)) - "av
g_quarterly_sales")) / "avg_quarterly_sales") ELSE null END) > DECIMAL '0.1')
ORDER BY "avg_quarterly_sales" ASC, "sum_sales" ASC, "i_manufact_id" ASC
LIMIT 100
```

Results: completed in 2 sec

+++++

[(451, '51.42', '122.38'), (451, '53.40', '122.38'), (451, '142.01', '122.38'), (451, '242.68', '122.38'), (107, '0.00', '124.18')]

SQL name: ./benchmark/tpcds/q54.sql...

=====

WITH

```
my_customers AS (
  SELECT DISTINCT
    "c_customer_sk"
  , "c_current_addr_sk"
  FROM
    (
      SELECT
        "cs_sold_date_sk" "sold_date_sk"
      , "cs_bill_customer_sk" "customer_sk"
      , "cs_item_sk" "item_sk"
      FROM
        tpcds.tiny.catalog_sales
    UNION ALL
      SELECT
        "ws_sold_date_sk" "sold_date_sk"
      , "ws_bill_customer_sk" "customer_sk"
      , "ws_item_sk" "item_sk"
      FROM
        tpcds.tiny.web_sales
    ) cs_or_ws_sales
  , tpcds.tiny.item
  , tpcds.tiny.date_dim
  , tpcds.tiny.customer
  WHERE ("sold_date_sk" = "d_date_sk")
    AND ("item_sk" = "i_item_sk")
    AND ("i_category" = 'Women')
    AND ("i_class" = 'maternity')
    AND ("c_customer_sk" = "cs_or_ws_sales"."customer_sk")
    AND ("d_moy" = 12)
    AND ("d_year" = 1998)
)
, my_revenue AS (
  SELECT
    "c_customer_sk"
```

```

, "sum"("ss_ext_sales_price") "revenue"
FROM
  my_customers
, tpcds.tiny.store_sales
, tpcds.tiny.customer_address
, tpcds.tiny.store
, tpcds.tiny.date_dim
WHERE ("c_current_addr_sk" = "ca_address_sk")
  AND ("ca_county" = "s_county")
  AND ("ca_state" = "s_state")
  AND ("ss_sold_date_sk" = "d_date_sk")
  AND ("c_customer_sk" = "ss_customer_sk")
  AND ("d_month_seq" BETWEEN (
    SELECT DISTINCT ("d_month_seq" + 1)
    FROM
      tpcds.tiny.date_dim
    WHERE ("d_year" = 1998)
      AND ("d_moy" = 12)
  ) AND (
    SELECT DISTINCT ("d_month_seq" + 3)
    FROM
      tpcds.tiny.date_dim
    WHERE ("d_year" = 1998)
      AND ("d_moy" = 12)
  ))
GROUP BY "c_customer_sk"
)
, segments AS (
  SELECT CAST(("revenue" / 50) AS INTEGER) "segment"
  FROM
    my_revenue
)
SELECT
  "segment"
, "count"(*) "num_customers"
, ("segment" * 50) "segment_base"
FROM
  segments
GROUP BY "segment"
ORDER BY "segment" ASC, "num_customers" ASC
LIMIT 100

```

Results: completed in 2 sec

+++++

[]

SQL name: ./benchmark/tpcds/q55.sql...

=====

```
SELECT
  "i_brand_id" "brand_id"
, "i_brand" "brand"
, "sum"("ss_ext_sales_price") "ext_price"
FROM
  tpcds.tiny.date_dim
, tpcds.tiny.store_sales
, tpcds.tiny.item
WHERE ("d_date_sk" = "ss_sold_date_sk")
  AND ("ss_item_sk" = "i_item_sk")
  AND ("i_manager_id" = 28)
  AND ("d_moy" = 11)
  AND ("d_year" = 1999)
GROUP BY "i_brand", "i_brand_id"
ORDER BY "ext_price" DESC, "i_brand_id" ASC
LIMIT 100
```

Results: completed in 2 sec

+++++

```
[(9016003, 'corpunivamalg #3', '23226.35'), (3004001, 'edu packex
porti #1', '20841.63'), (6015001, 'scholarbrand #1
', '18992.54'), (1002001, 'importoamalg #1', '13599.84'), (10015
011, 'scholaramalgamalg #11', '12423.67')]
```

SQL name: ./benchmark/tpcds/q56.sql...

=====

```
WITH
  ss AS (
    SELECT
      "i_item_id"
    , "sum"("ss_ext_sales_price") "total_sales"
```

```

FROM
    tpcds.tiny.store_sales
, tpcds.tiny.date_dim
, tpcds.tiny.customer_address
, tpcds.tiny.item
WHERE ("i_item_id" IN (
    SELECT "i_item_id"
    FROM
        tpcds.tiny.item
    WHERE ("i_color" IN ('slate'          , 'blanched'          , 'burnished'))
))
AND ("ss_item_sk" = "i_item_sk")
AND ("ss_sold_date_sk" = "d_date_sk")
AND ("d_year" = 2001)
AND ("d_moy" = 2)
AND ("ss_addr_sk" = "ca_address_sk")
AND ("ca_gmt_offset" = -5)
GROUP BY "i_item_id"
)
, cs AS (
    SELECT
        "i_item_id"
    , "sum"("cs_ext_sales_price") "total_sales"
    FROM
        tpcds.tiny.catalog_sales
    , tpcds.tiny.date_dim
    , tpcds.tiny.customer_address
    , tpcds.tiny.item
    WHERE ("i_item_id" IN (
        SELECT "i_item_id"
        FROM
            tpcds.tiny.item
        WHERE ("i_color" IN ('slate'          , 'blanched'          , 'burnished'))
    ))
    AND ("cs_item_sk" = "i_item_sk")
    AND ("cs_sold_date_sk" = "d_date_sk")
    AND ("d_year" = 2001)
    AND ("d_moy" = 2)
    AND ("cs_bill_addr_sk" = "ca_address_sk")
    AND ("ca_gmt_offset" = -5)
    GROUP BY "i_item_id"
)
, ws AS (

```

```

SELECT
    "i_item_id"
  , "sum"("ws_ext_sales_price") "total_sales"
FROM
    tpcds.tiny.web_sales
  , tpcds.tiny.date_dim
  , tpcds.tiny.customer_address
  , tpcds.tiny.item
WHERE ("i_item_id" IN (
    SELECT "i_item_id"
    FROM
        tpcds.tiny.item
    WHERE ("i_color" IN ('slate'      , 'blanched'      , 'burnished'))
))
AND ("ws_item_sk" = "i_item_sk")
AND ("ws_sold_date_sk" = "d_date_sk")
AND ("d_year" = 2001)
AND ("d_moy" = 2)
AND ("ws_bill_addr_sk" = "ca_address_sk")
AND ("ca_gmt_offset" = -5)
GROUP BY "i_item_id"
)
SELECT
    "i_item_id"
  , "sum"("total_sales") "total_sales"
FROM
    (
        SELECT *
        FROM
            ss
    UNION ALL
        SELECT *
        FROM
            cs
    UNION ALL
        SELECT *
        FROM
            ws
    ) tmp1
GROUP BY "i_item_id"
ORDER BY "total_sales" ASC, "i_item_id" ASC
LIMIT 100

```


Results: completed in 2 sec

+++++

```
[('AAAAAAAKBCAAAA', '57.59'), ('AAAAAAAGAHAAAA', '75.32'), ('AAAAAAAGJEAAAA', '100.00'), ('AA  
AAAAAAIKFAAAAA', '280.64'), ('AAAAAAAKMHAAAA', '389.95')]
```

SQL name: ./benchmark/tpcds/q57.sql...

=====

WITH

```
  v1 AS (
    SELECT
      "i_category"
    , "i_brand"
    , "cc_name"
    , "d_year"
    , "d_moy"
    , "sum"("cs_sales_price") "sum_sales"
    , "avg"("sum"("cs_sales_price")) OVER (PARTITION BY "i_category", "i_brand", "cc_name", "d_yea  
r") "avg_monthly_sales"
    , "rank"() OVER (PARTITION BY "i_category", "i_brand", "cc_name" ORDER BY "d_year" ASC, "d_moy"  
ASC) "rn"
    FROM
      tpcds.tiny.item
    , tpcds.tiny.catalog_sales
    , tpcds.tiny.date_dim
    , tpcds.tiny.call_center
    WHERE ("cs_item_sk" = "i_item_sk")
      AND ("cs_sold_date_sk" = "d_date_sk")
      AND ("cc_call_center_sk" = "cs_call_center_sk")
      AND (("d_year" = 1999)
        OR (("d_year" = (1999 - 1))
          AND ("d_moy" = 12))
        OR (("d_year" = (1999 + 1))
          AND ("d_moy" = 1)))
    GROUP BY "i_category", "i_brand", "cc_name", "d_year", "d_moy"
  )
, v2 AS (
  SELECT
    "v1"."i_category"
  , "v1"."i_brand"
  , "v1"."cc_name"
  , "v1"."d_year"
  , "v1"."d_moy"
```

```

, "v1"."avg_monthly_sales"
, "v1"."sum_sales"
, "v1_lag"."sum_sales" "psum"
, "v1_lead"."sum_sales" "nsum"
FROM
  v1
, v1 v1_lag
, v1 v1_lead
WHERE ("v1"."i_category" = "v1_lag"."i_category")
  AND ("v1"."i_category" = "v1_lead"."i_category")
  AND ("v1"."i_brand" = "v1_lag"."i_brand")
  AND ("v1"."i_brand" = "v1_lead"."i_brand")
  AND ("v1"."cc_name" = "v1_lag"."cc_name")
  AND ("v1"."cc_name" = "v1_lead"."cc_name")
  AND ("v1"."rn" = ("v1_lag"."rn" + 1))
  AND ("v1"."rn" = ("v1_lead"."rn" - 1))
)
SELECT *
FROM
  v2
WHERE ("d_year" = 1999)
  AND ("avg_monthly_sales" > 0)
  AND ((CASE WHEN ("avg_monthly_sales" > 0) THEN ("abs"((("sum_sales" - "avg_monthly_sales")) / "avg_monthly_sales") ELSE null END) > DECIMAL '0.1')
ORDER BY ("sum_sales" - "avg_monthly_sales") ASC, 3 ASC
LIMIT 100

```

Results: completed in 2 sec

```

+++++
[('Men', 'exportiimporto #1
', 'NY Metro', 1999, 6, '815.93', '45.63', '570.54', '476.17'), ('Shoes
', 'edu packedu pack #1', 'Mid Atlantic', 1999, 4, '866.93', '126.8
9', '294.79', '558.99'), ('Shoes', 'edu packedu pack #
1', 'Mid Atlantic', 1999, 7, '866.93', '129.07', '486.59', '1541.2
7'), ('Men', 'exportiimporto #1
', 'NY Metro', 1999, 2, '815.93', '87.03', '507.68', '452.95'), ('Shoes
', 'exportiedu pack #1', 'NY Metro', 1999, 3, '812.75', '150.52',
'307.75', '242.01')]]

```

SQL name: ./benchmark/tpcds/q58.sql...

```

=====
WITH
  ss_items AS (
    SELECT
      "i_item_id" "item_id"
    , "sum"("ss_ext_sales_price") "ss_item_rev"
    FROM
      tpcds.tiny.store_sales
    , tpcds.tiny.item
    , tpcds.tiny.date_dim
    WHERE ("ss_item_sk" = "i_item_sk")
      AND ("d_date" IN (
        SELECT "d_date"
        FROM
          tpcds.tiny.date_dim
        WHERE ("d_week_seq" = (
          SELECT "d_week_seq"
          FROM
            tpcds.tiny.date_dim
            WHERE ("d_date" = CAST('2000-01-03' AS DATE))
          ))
        ))
      AND ("ss_sold_date_sk" = "d_date_sk")
    GROUP BY "i_item_id"
  )
, cs_items AS (
  SELECT
    "i_item_id" "item_id"
  , "sum"("cs_ext_sales_price") "cs_item_rev"
  FROM
    tpcds.tiny.catalog_sales
  , tpcds.tiny.item
  , tpcds.tiny.date_dim
  WHERE ("cs_item_sk" = "i_item_sk")
    AND ("d_date" IN (
      SELECT "d_date"
      FROM
        tpcds.tiny.date_dim
      WHERE ("d_week_seq" = (
        SELECT "d_week_seq"
        FROM
          tpcds.tiny.date_dim
          WHERE ("d_date" = CAST('2000-01-03' AS DATE))
        ))
      ))

```

```

        ))
    ))
    AND ("cs_sold_date_sk" = "d_date_sk")
    GROUP BY "i_item_id"
)
, ws_items AS (
    SELECT
        "i_item_id" "item_id"
        , "sum"("ws_ext_sales_price") "ws_item_rev"
    FROM
        tpcds.tiny.web_sales
        , tpcds.tiny.item
        , tpcds.tiny.date_dim
    WHERE ("ws_item_sk" = "i_item_sk")
        AND ("d_date" IN (
            SELECT "d_date"
            FROM
                tpcds.tiny.date_dim
            WHERE ("d_week_seq" = (
                SELECT "d_week_seq"
                FROM
                    tpcds.tiny.date_dim
                WHERE ("d_date" = CAST('2000-01-03' AS DATE))
            ))
        ))
    ))
    AND ("ws_sold_date_sk" = "d_date_sk")
    GROUP BY "i_item_id"
)
SELECT
    "ss_items"."item_id"
    , "ss_item_rev"
    , CAST((((("ss_item_rev" / ((CAST("ss_item_rev" AS DECIMAL(16,7)) + "cs_item_rev") + "ws_item_rev"))
    / 3) * 100) AS DECIMAL(7,2)) "ss_dev"
    , "cs_item_rev"
    , CAST((((("cs_item_rev" / ((CAST("ss_item_rev" AS DECIMAL(16,7)) + "cs_item_rev") + "ws_item_rev"))
    / 3) * 100) AS DECIMAL(7,2)) "cs_dev"
    , "ws_item_rev"
    , CAST((((("ws_item_rev" / ((CAST("ss_item_rev" AS DECIMAL(16,7)) + "cs_item_rev") + "ws_item_rev"))
    / 3) * 100) AS DECIMAL(7,2)) "ws_dev"
    , (((("ss_item_rev" + "cs_item_rev") + "ws_item_rev") / 3) "average"
FROM
    ss_items
    , cs_items

```

```

, ws_items
WHERE ("ss_items"."item_id" = "cs_items"."item_id")
  AND ("ss_items"."item_id" = "ws_items"."item_id")
  AND ("ss_item_rev" BETWEEN (DECIMAL '0.9' * "cs_item_rev") AND (DECIMAL '1.1' * "cs_item_rev"))
  AND ("ss_item_rev" BETWEEN (DECIMAL '0.9' * "ws_item_rev") AND (DECIMAL '1.1' * "ws_item_rev"))
  AND ("cs_item_rev" BETWEEN (DECIMAL '0.9' * "ss_item_rev") AND (DECIMAL '1.1' * "ss_item_rev"))
  AND ("cs_item_rev" BETWEEN (DECIMAL '0.9' * "ws_item_rev") AND (DECIMAL '1.1' * "ws_item_rev"))
  AND ("ws_item_rev" BETWEEN (DECIMAL '0.9' * "ss_item_rev") AND (DECIMAL '1.1' * "ss_item_rev"))
  AND ("ws_item_rev" BETWEEN (DECIMAL '0.9' * "cs_item_rev") AND (DECIMAL '1.1' * "cs_item_rev"))
ORDER BY "ss_items"."item_id" ASC, "ss_item_rev" ASC
LIMIT 100

```

Results: completed in 2 sec

```

+++++
[]

```

SQL name: ./benchmark/tpcds/q59.sql...

=====

```

WITH
  wss AS (
    SELECT
      "d_week_seq"
    , "ss_store_sk"
    , "sum"((CASE WHEN ("d_day_name" = 'Sunday') THEN "ss_sales_price" ELSE null END)) "sun_sales"
    , "sum"((CASE WHEN ("d_day_name" = 'Monday') THEN "ss_sales_price" ELSE null END)) "mon_sales"
    , "sum"((CASE WHEN ("d_day_name" = 'Tuesday') THEN "ss_sales_price" ELSE null END)) "tue_sales"
    , "sum"((CASE WHEN ("d_day_name" = 'Wednesday') THEN "ss_sales_price" ELSE null END)) "wed_sale
s"
    , "sum"((CASE WHEN ("d_day_name" = 'Thursday') THEN "ss_sales_price" ELSE null END)) "thu_sales"
    , "sum"((CASE WHEN ("d_day_name" = 'Friday') THEN "ss_sales_price" ELSE null END)) "fri_sales"
    , "sum"((CASE WHEN ("d_day_name" = 'Saturday') THEN "ss_sales_price" ELSE null END)) "sat_sales"
    FROM
      tpcds.tiny.store_sales
    , tpcds.tiny.date_dim
    WHERE ("d_date_sk" = "ss_sold_date_sk")
    GROUP BY "d_week_seq", "ss_store_sk"
  )
SELECT
  "s_store_name1"

```

```

, "s_store_id1"
, "d_week_seq1"
, ("sun_sales1" / "sun_sales2")
, ("mon_sales1" / "mon_sales2")
, ("tue_sales1" / "tue_sales2")
, ("wed_sales1" / "wed_sales2")
, ("thu_sales1" / "thu_sales2")
, ("fri_sales1" / "fri_sales2")
, ("sat_sales1" / "sat_sales2")
FROM
(
  SELECT
    "s_store_name" "s_store_name1"
  , "wss"."d_week_seq" "d_week_seq1"
  , "s_store_id" "s_store_id1"
  , "sun_sales" "sun_sales1"
  , "mon_sales" "mon_sales1"
  , "tue_sales" "tue_sales1"
  , "wed_sales" "wed_sales1"
  , "thu_sales" "thu_sales1"
  , "fri_sales" "fri_sales1"
  , "sat_sales" "sat_sales1"
  FROM
    wss
  , tpcds.tiny.store
  , tpcds.tiny.date_dim d
  WHERE ("d"."d_week_seq" = "wss"."d_week_seq")
    AND ("ss_store_sk" = "s_store_sk")
    AND ("d_month_seq" BETWEEN 1212 AND (1212 + 11))
) y
, (
  SELECT
    "s_store_name" "s_store_name2"
  , "wss"."d_week_seq" "d_week_seq2"
  , "s_store_id" "s_store_id2"
  , "sun_sales" "sun_sales2"
  , "mon_sales" "mon_sales2"
  , "tue_sales" "tue_sales2"
  , "wed_sales" "wed_sales2"
  , "thu_sales" "thu_sales2"
  , "fri_sales" "fri_sales2"
  , "sat_sales" "sat_sales2"
  FROM

```

```

        wss
    , tpcds.tiny.store
    , tpcds.tiny.date_dim d
WHERE ("d"."d_week_seq" = "wss"."d_week_seq")
      AND ("ss_store_sk" = "s_store_sk")
      AND ("d_month_seq" BETWEEN (1212 + 12) AND (1212 + 23))
) x
WHERE ("s_store_id1" = "s_store_id2")
      AND ("d_week_seq1" = ("d_week_seq2" - 52))
ORDER BY "s_store_name1" ASC, "s_store_id1" ASC, "d_week_seq1" ASC
LIMIT 100

```

Results: completed in 2 sec

```

+++++
[('able', 'AAAAAAAAACAAAAAA', 5271, '1.35', None, None, None, '0.89', '0.56', '1.57'), ('able', 'AA
AAAAACAAAAAA', 5271, '1.35', None, None, None, '0.89', '0.56', '1.57'), ('able', 'AAAAAAACAAAAAA
A', 5271, '1.35', None, None, None, '0.89', '0.56', '1.57'), ('able', 'AAAAAAACAAAAAA', 5271, '1.
35', None, None, None, '0.89', '0.56', '1.57'), ('able', 'AAAAAAACAAAAAA', 5271, '1.35', None, No
ne, None, '0.89', '0.56', '1.57')]

```

SQL name: ./benchmark/tpcds/q60.sql...

=====

```

WITH
  ss AS (
    SELECT
      "i_item_id"
    , "sum"("ss_ext_sales_price") "total_sales"
    FROM
      tpcds.tiny.store_sales
    , tpcds.tiny.date_dim
    , tpcds.tiny.customer_address
    , tpcds.tiny.item
    WHERE ("i_item_id" IN (
      SELECT "i_item_id"
      FROM
        tpcds.tiny.item
      WHERE ("i_category" IN ('Music'))
    ))
    AND ("ss_item_sk" = "i_item_sk")
    AND ("ss_sold_date_sk" = "d_date_sk")

```

```

        AND ("d_year" = 1998)
        AND ("d_moy" = 9)
        AND ("ss_addr_sk" = "ca_address_sk")
        AND ("ca_gmt_offset" = -5)
    GROUP BY "i_item_id"
)
, cs AS (
    SELECT
        "i_item_id"
        , "sum"("cs_ext_sales_price") "total_sales"
    FROM
        tpcds.tiny.catalog_sales
        , tpcds.tiny.date_dim
        , tpcds.tiny.customer_address
        , tpcds.tiny.item
    WHERE ("i_item_id" IN (
        SELECT "i_item_id"
        FROM
            tpcds.tiny.item
        WHERE ("i_category" IN ('Music'))
    ))
        AND ("cs_item_sk" = "i_item_sk")
        AND ("cs_sold_date_sk" = "d_date_sk")
        AND ("d_year" = 1998)
        AND ("d_moy" = 9)
        AND ("cs_bill_addr_sk" = "ca_address_sk")
        AND ("ca_gmt_offset" = -5)
    GROUP BY "i_item_id"
)
, ws AS (
    SELECT
        "i_item_id"
        , "sum"("ws_ext_sales_price") "total_sales"
    FROM
        tpcds.tiny.web_sales
        , tpcds.tiny.date_dim
        , tpcds.tiny.customer_address
        , tpcds.tiny.item
    WHERE ("i_item_id" IN (
        SELECT "i_item_id"
        FROM
            tpcds.tiny.item
        WHERE ("i_category" IN ('Music'))
    ))

```



```

))
  AND ("ws_item_sk" = "i_item_sk")
  AND ("ws_sold_date_sk" = "d_date_sk")
  AND ("d_year" = 1998)
  AND ("d_moy" = 9)
  AND ("ws_bill_addr_sk" = "ca_address_sk")
  AND ("ca_gmt_offset" = -5)
GROUP BY "i_item_id"
)
SELECT
  "i_item_id"
, "sum"("total_sales") "total_sales"
FROM
  (
    SELECT *
    FROM
      SS
    UNION ALL
    SELECT *
    FROM
      CS
    UNION ALL
    SELECT *
    FROM
      WS
  ) tmp1
GROUP BY "i_item_id"
ORDER BY "i_item_id" ASC, "total_sales" ASC
LIMIT 100

```

Results: completed in 2 sec

+++++

```

[('AAAAAAAAAAHAAAAA', '321.76'), ('AAAAAAAAAADBAAAAA', '1648.20'), ('AAAAAAAAAEBAAAAA', '3378.42'),
('AAAAAAAAAGFAAAAA', '2937.12'), ('AAAAAAAAAGHAAAAA', '6229.09')]

```

SQL name: ./benchmark/tpcds/q61.sql...

=====

```

SELECT
  "promotions"
, "total"
, ((CAST("promotions" AS DECIMAL(15,4)) / CAST("total" AS DECIMAL(15,4))) * 100)
FROM

```

```

(
  SELECT "sum"("ss_ext_sales_price") "promotions"
  FROM
    tpcds.tiny.store_sales
  , tpcds.tiny.store
  , tpcds.tiny.promotion
  , tpcds.tiny.date_dim
  , tpcds.tiny.customer
  , tpcds.tiny.customer_address
  , tpcds.tiny.item
  WHERE ("ss_sold_date_sk" = "d_date_sk")
    AND ("ss_store_sk" = "s_store_sk")
    AND ("ss_promo_sk" = "p_promo_sk")
    AND ("ss_customer_sk" = "c_customer_sk")
    AND ("ca_address_sk" = "c_current_addr_sk")
    AND ("ss_item_sk" = "i_item_sk")
    AND ("ca_gmt_offset" = -5)
    AND ("i_category" = 'Jewelry')
    AND (("p_channel_dmail" = 'Y')
      OR ("p_channel_email" = 'Y')
      OR ("p_channel_tv" = 'Y'))
    AND ("s_gmt_offset" = -5)
    AND ("d_year" = 1998)
    AND ("d_moy" = 11)
) promotional_sales
, (
  SELECT "sum"("ss_ext_sales_price") "total"
  FROM
    tpcds.tiny.store_sales
  , tpcds.tiny.store
  , tpcds.tiny.date_dim
  , tpcds.tiny.customer
  , tpcds.tiny.customer_address
  , tpcds.tiny.item
  WHERE ("ss_sold_date_sk" = "d_date_sk")
    AND ("ss_store_sk" = "s_store_sk")
    AND ("ss_customer_sk" = "c_customer_sk")
    AND ("ca_address_sk" = "c_current_addr_sk")
    AND ("ss_item_sk" = "i_item_sk")
    AND ("ca_gmt_offset" = -5)
    AND ("i_category" = 'Jewelry')
    AND ("s_gmt_offset" = -5)
    AND ("d_year" = 1998)

```

```

        AND ("d_moy" = 11)
    ) all_sales
ORDER BY "promotions" ASC, "total" ASC
LIMIT 100

```

Results: completed in 2 sec

```

+++++
[('299773.09', '304031.94', '98.6000')]

```

SQL name: ./benchmark/tpcds/q62.sql...

=====

```

SELECT
    "substr"("w_warehouse_name", 1, 20)
  , "sm_type"
  , "web_name"
  , "sum"((CASE WHEN (("ws_ship_date_sk" - "ws_sold_date_sk") <= 30) THEN 1 ELSE 0 END)) "30 days"
  , "sum"((CASE WHEN (("ws_ship_date_sk" - "ws_sold_date_sk") > 30)
    AND (("ws_ship_date_sk" - "ws_sold_date_sk") <= 60) THEN 1 ELSE 0 END)) "31-60 days"
  , "sum"((CASE WHEN (("ws_ship_date_sk" - "ws_sold_date_sk") > 60)
    AND (("ws_ship_date_sk" - "ws_sold_date_sk") <= 90) THEN 1 ELSE 0 END)) "61-90 days"
  , "sum"((CASE WHEN (("ws_ship_date_sk" - "ws_sold_date_sk") > 90)
    AND (("ws_ship_date_sk" - "ws_sold_date_sk") <= 120) THEN 1 ELSE 0 END)) "91-120 days"
  , "sum"((CASE WHEN (("ws_ship_date_sk" - "ws_sold_date_sk") > 120) THEN 1 ELSE 0 END)) ">120 days"
FROM
    tpcds.tiny.web_sales
  , tpcds.tiny.warehouse
  , tpcds.tiny.ship_mode
  , tpcds.tiny.web_site
  , tpcds.tiny.date_dim
WHERE ("d_month_seq" BETWEEN 1200 AND (1200 + 11))
    AND ("ws_ship_date_sk" = "d_date_sk")
    AND ("ws_warehouse_sk" = "w_warehouse_sk")
    AND ("ws_ship_mode_sk" = "sm_ship_mode_sk")
    AND ("ws_web_site_sk" = "web_site_sk")
GROUP BY "substr"("w_warehouse_name", 1, 20), "sm_type", "web_name"
ORDER BY "substr"("w_warehouse_name", 1, 20) ASC, "sm_type" ASC, "web_name" ASC
LIMIT 100

```

Results: completed in 1 sec

+++++

```
[('Conventional childr', 'EXPRESS', 'site_0', 128, 107, 124, 93, 0), ('Conve
ntional childr', 'LIBRARY', 'site_0', 77, 77, 90, 75, 0), ('Conventional chi
ldr', 'NEXT DAY', 'site_0', 109, 117, 114, 109, 0), ('Conventional childr',
'OVERNIGHT', 'site_0', 78, 84, 83, 68, 0), ('Conventional childr', 'REGULAR
', 'site_0', 93, 87, 75, 65, 0)]
```

SQL name: ./benchmark/tpcds/q63.sql...

=====

```
SELECT *
FROM
(
  SELECT
    "i_manager_id"
    , "sum"("ss_sales_price") "sum_sales"
    , "avg"("sum"("ss_sales_price")) OVER (PARTITION BY "i_manager_id") "avg_monthly_sales"
  FROM
    tpcds.tiny.item
    , tpcds.tiny.store_sales
    , tpcds.tiny.date_dim
    , tpcds.tiny.store
  WHERE ("ss_item_sk" = "i_item_sk")
    AND ("ss_sold_date_sk" = "d_date_sk")
    AND ("ss_store_sk" = "s_store_sk")
    AND ("d_month_seq" IN (1200 , (1200 + 1) , (1200 + 2) , (1200 + 3) , (1200 + 4) ,
(1200 + 5) , (1200 + 6) , (1200 + 7) , (1200 + 8) , (1200 + 9) , (1200 + 10) , (1200 +
11)))
    AND (((("i_category" IN ('Books' , 'Children' , 'Electronics'))
    AND ("i_class" IN ('personal' , 'portable' , 'reference' , 'sel
f-help'))
    AND ("i_brand" IN ('scholaramalgamalg #14' , 'scholaramalgamalg #7' ,
'exportiunivamalg #9' , 'scholaramalgamalg #9'))))
    OR ((("i_category" IN ('Women' , 'Music' , 'Men'))
    AND ("i_class" IN ('accessories' , 'classical' , 'fragrances' ,
'pants'))
    AND ("i_brand" IN ('amalgimporto #1' , 'edu packscholar #1' , 'exportii
importo #1' , 'importoamalg #1'))))
  GROUP BY "i_manager_id", "d_moy"
) tmp1
WHERE ((CASE WHEN ("avg_monthly_sales" > 0) THEN ("abs"("sum_sales" - "avg_monthly_sales")) / "avg
_monthly_sales") ELSE null END) > DECIMAL '0.1')
```

```
ORDER BY "i_manager_id" ASC, "avg_monthly_sales" ASC, "sum_sales" ASC
LIMIT 100
```

Results: completed in 2 sec

+++++

```
[(6, '4.68', '241.17'), (6, '17.82', '241.17'), (6, '51.64', '241.17'), (6, '51.86', '241.17'), (6,
'92.48', '241.17')]
```

SQL name: ./benchmark/tpcds/q64.sql...

=====

WITH

```
    cs_ui AS (
        SELECT
            "cs_item_sk"
            , "sum"("cs_ext_list_price") "sale"
            , "sum"((( "cr_refunded_cash" + "cr_reversed_charge") + "cr_store_credit")) "refund"
        FROM
            tpcds.tiny.catalog_sales
            , tpcds.tiny.catalog_returns
        WHERE ("cs_item_sk" = "cr_item_sk")
            AND ("cs_order_number" = "cr_order_number")
        GROUP BY "cs_item_sk"
        HAVING ("sum"("cs_ext_list_price") > (2 * "sum"((( "cr_refunded_cash" + "cr_reversed_charge") +
"cr_store_credit"))))
    )
    , cross_sales AS (
        SELECT
            "i_product_name" "product_name"
            , "i_item_sk" "item_sk"
            , "s_store_name" "store_name"
            , "s_zip" "store_zip"
            , "ad1"."ca_street_number" "b_street_number"
            , "ad1"."ca_street_name" "b_street_name"
            , "ad1"."ca_city" "b_city"
            , "ad1"."ca_zip" "b_zip"
            , "ad2"."ca_street_number" "c_street_number"
            , "ad2"."ca_street_name" "c_street_name"
            , "ad2"."ca_city" "c_city"
            , "ad2"."ca_zip" "c_zip"
            , "d1"."d_year" "syear"
```

```

, "d2"."d_year" "fsyear"
, "d3"."d_year" "s2year"
, "count"(*) "cnt"
, "sum"("ss_warehouse_cost") "s1"
, "sum"("ss_list_price") "s2"
, "sum"("ss_coupon_amt") "s3"
FROM
    tpchds.tiny.store_sales
, tpchds.tiny.store_returns
, cs_ui
, tpchds.tiny.date_dim d1
, tpchds.tiny.date_dim d2
, tpchds.tiny.date_dim d3
, tpchds.tiny.store
, tpchds.tiny.customer
, tpchds.tiny.customer_demographics cd1
, tpchds.tiny.customer_demographics cd2
, tpchds.tiny.promotion
, tpchds.tiny.household_demographics hd1
, tpchds.tiny.household_demographics hd2
, tpchds.tiny.customer_address ad1
, tpchds.tiny.customer_address ad2
, tpchds.tiny.income_band ib1
, tpchds.tiny.income_band ib2
, tpchds.tiny.item
WHERE ("ss_store_sk" = "s_store_sk")
    AND ("ss_sold_date_sk" = "d1"."d_date_sk")
    AND ("ss_customer_sk" = "c_customer_sk")
    AND ("ss_cdemo_sk" = "cd1"."cd_demo_sk")
    AND ("ss_hdemo_sk" = "hd1"."hd_demo_sk")
    AND ("ss_addr_sk" = "ad1"."ca_address_sk")
    AND ("ss_item_sk" = "i_item_sk")
    AND ("ss_item_sk" = "sr_item_sk")
    AND ("ss_ticket_number" = "sr_ticket_number")
    AND ("ss_item_sk" = "cs_ui"."cs_item_sk")
    AND ("c_current_cdemo_sk" = "cd2"."cd_demo_sk")
    AND ("c_current_hdemo_sk" = "hd2"."hd_demo_sk")
    AND ("c_current_addr_sk" = "ad2"."ca_address_sk")
    AND ("c_first_sales_date_sk" = "d2"."d_date_sk")
    AND ("c_first_shipto_date_sk" = "d3"."d_date_sk")
    AND ("ss_promo_sk" = "p_promo_sk")
    AND ("hd1"."hd_income_band_sk" = "ib1"."ib_income_band_sk")
    AND ("hd2"."hd_income_band_sk" = "ib2"."ib_income_band_sk")

```

```

        AND ("cd1"."cd_marital_status" <> "cd2"."cd_marital_status")
        AND ("i_color" IN ('purple'      , 'burlywood'      , 'indian'      , 'spring'      , 'floral'      , 'mediu
m'))
        AND ("i_current_price" BETWEEN 64 AND (64 + 10))
        AND ("i_current_price" BETWEEN (64 + 1) AND (64 + 15))
    GROUP BY "i_product_name", "i_item_sk", "s_store_name", "s_zip", "ad1"."ca_street_number", "ad
1"."ca_street_name", "ad1"."ca_city", "ad1"."ca_zip", "ad2"."ca_street_number", "ad2"."ca_street_na
me", "ad2"."ca_city", "ad2"."ca_zip", "d1"."d_year", "d2"."d_year", "d3"."d_year"
)
SELECT
    "cs1"."product_name"
    , "cs1"."store_name"
    , "cs1"."store_zip"
    , "cs1"."b_street_number"
    , "cs1"."b_street_name"
    , "cs1"."b_city"
    , "cs1"."b_zip"
    , "cs1"."c_street_number"
    , "cs1"."c_street_name"
    , "cs1"."c_city"
    , "cs1"."c_zip"
    , "cs1"."syear"
    , "cs1"."cnt"
    , "cs1"."s1" "s11"
    , "cs1"."s2" "s21"
    , "cs1"."s3" "s31"
    , "cs2"."s1" "s12"
    , "cs2"."s2" "s22"
    , "cs2"."s3" "s32"
    , "cs2"."syear"
    , "cs2"."cnt"
FROM
    cross_sales cs1
    , cross_sales cs2
WHERE ("cs1"."item_sk" = "cs2"."item_sk")
    AND ("cs1"."syear" = 1999)
    AND ("cs2"."syear" = (1999 + 1))
    AND ("cs2"."cnt" <= "cs1"."cnt")
    AND ("cs1"."store_name" = "cs2"."store_name")
    AND ("cs1"."store_zip" = "cs2"."store_zip")
ORDER BY "cs1"."product_name" ASC, "cs1"."store_name" ASC, "cs2"."cnt" ASC, 14, 15, 16, 17, 18

```

```

Traceback (most recent call last):
  File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.py",
line 955, in fetchone
    row = dbapi_cursor.fetchone()
  File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 106,
in fetchone
    self._fetch_while(lambda: not self._data and self._state != self._STATE_FINISHED)
  File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 46, i
n _fetch_while
    self._fetch_more()
  File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 308,
in _fetch_more
    self._process_response(self._requests_session.get(self._nextUri, **self._requests_kwargs))
  File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 349,
in _process_response
    raise DatabaseError(response_json['error'])
pyhive.exc.DatabaseError: {'message': 'Query exceeded per-node user memory limit of 102.40MB [Alloc
ated: 102.35MB, Delta: 128.26kB, Top Consumers: {HashBuilderOperator=102.35MB, ScanFilterAndProject
Operator=21.51MB, PartitionedOutputOperator=17.65MB}, Details: [{\"taskId\":\"46.0.0\",\"reservation\":\"2
4.08MB\",\"topConsumers\": [{\"type\":\"HashBuilderOperator\",\"planNodeId\":\"3419\",\"reservations\": [\"1.52M
B\",\"1.51MB\",\"1.51MB\",\"1.51MB\",\"1.51MB\",\"1.51MB\",\"1.51MB\",\"1.51MB\",\"1.50MB\",\"1.50MB\",\"1.50MB\",\"1.50M
B\",\"1.50MB\",\"1.50MB\",\"1.50MB\",\"1.50MB\"], \"total\":\"24.08MB\",\"info\":\"INNER;PARTITIONED;\"}]], {\"taskI
d\":\"10.0.0\",\"reservation\":\"13.52MB\",\"topConsumers\": [{\"type\":\"HashBuilderOperator\",\"planNodeId\":\"335
8\",\"reservations\": [\"897.53kB\",\"885.27kB\",\"867.15kB\",\"866.97kB\",\"863.50kB\",\"862.79kB\",\"862.77kB\",\"86
2.46kB\",\"861.62kB\",\"861.29kB\",\"860.74kB\",\"859.46kB\",\"858.71kB\",\"858.52kB\",\"856.06kB\",\"855.61kB\"], \"t
otal\":\"13.52MB\",\"info\":\"INNER;PARTITIONED;\"}]], {\"taskId\":\"11.0.0\",\"reservation\":\"12.99MB\",\"topConsu
mers\": [{\"type\":\"HashBuilderOperator\",\"planNodeId\":\"3357\",\"reservations\": [\"841.78kB\",\"836.79kB\",\"83
6.24kB\",\"835.89kB\",\"835.03kB\",\"834.56kB\",\"833.72kB\",\"833.14kB\",\"832.16kB\",\"831.87kB\",\"831.63kB\",\"83
1.07kB\",\"829.19kB\",\"828.57kB\",\"827.44kB\",\"806.09kB\"], \"total\":\"12.99MB\",\"info\":\"INNER;PARTITIONE
D;\"}]]]', 'errorCode': 131079, 'errorName': 'EXCEEDED_LOCAL_MEMORY_LIMIT', 'errorType': 'INSUFFICI
ENT_RESOURCES', 'boolean': False, 'failureInfo': {'type': 'com.facebook.presto.ExceededMemoryLimitE
xception', 'message': 'Query exceeded per-node user memory limit of 102.40MB [Allocated: 102.35MB,
Delta: 128.26kB, Top Consumers: {HashBuilderOperator=102.35MB, ScanFilterAndProjectOperator=21.51M
B, PartitionedOutputOperator=17.65MB}, Details: [{\"taskId\":\"46.0.0\",\"reservation\":\"24.08MB\",\"topCon
sumers\": [{\"type\":\"HashBuilderOperator\",\"planNodeId\":\"3419\",\"reservations\": [\"1.52MB\",\"1.51MB\",\"1.51M
B\",\"1.51MB\",\"1.51MB\",\"1.51MB\",\"1.51MB\",\"1.50MB\",\"1.50MB\",\"1.50MB\",\"1.50MB\",\"1.50MB\",\"1.50MB\",
\"1.50MB\",\"1.50MB\"], \"total\":\"24.08MB\",\"info\":\"INNER;PARTITIONED;\"}]], {\"taskId\":\"10.0.0\",\"reservat
ion\":\"13.52MB\",\"topConsumers\": [{\"type\":\"HashBuilderOperator\",\"planNodeId\":\"3358\",\"reservations\": [\"8
97.53kB\",\"885.27kB\",\"867.15kB\",\"866.97kB\",\"863.50kB\",\"862.79kB\",\"862.77kB\",\"862.46kB\",\"861.62kB\",\"8
61.29kB\",\"860.74kB\",\"859.46kB\",\"858.71kB\",\"858.52kB\",\"856.06kB\",\"855.61kB\"], \"total\":\"13.52MB\",\"inf
o\":\"INNER;PARTITIONED;\"}]], {\"taskId\":\"11.0.0\",\"reservation\":\"12.99MB\",\"topConsumers\": [{\"type\":\"Hash
BuilderOperator\",\"planNodeId\":\"3357\",\"reservations\": [\"841.78kB\",\"836.79kB\",\"836.24kB\",\"835.89kB\",\"8

```



```

35.03kB", "834.56kB", "833.72kB", "833.14kB", "832.16kB", "831.87kB", "831.63kB", "831.07kB", "829.19kB", "8
28.57kB", "827.44kB", "806.09kB"], "total": "12.99MB", "info": "INNER;PARTITIONED;"}}]]]', 'suppressed':
[], 'stack': ['com.facebook.presto.ExceededMemoryLimitException.exceededLocalUserMemoryLimit(Exceed
edMemoryLimitException.java:49)', 'com.facebook.presto.memory.QueryContext.enforceUserMemoryLimit(Q
ueryContext.java:496)', 'com.facebook.presto.memory.QueryContext.updateUserMemory(QueryContext.jav
a:192)', 'com.facebook.presto.memory.QueryContext$QueryMemoryReservationHandler.reserveMemory(Query
Context.java:462)', 'com.facebook.presto.memory.context.RootAggregatedMemoryContext.updateBytes(Roo
tAggregatedMemoryContext.java:37)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContex
t.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggr
egatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memor
y.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.fac
ebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.j
ava:38)', 'com.facebook.presto.memory.context.SimpleLocalMemoryContext.setBytes(SimpleLocalMemoryCo
ntext.java:82)', 'com.facebook.presto.operator.OperatorContext$InternalLocalMemoryContext.setBytes
(OperatorContext.java:672)', 'com.facebook.presto.operator.HashBuilderOperator.finishInput(HashBuil
derOperator.java:503)', 'com.facebook.presto.operator.HashBuilderOperator.finish(HashBuilderOperato
r.java:454)', 'com.facebook.presto.operator.Driver.processInternal(Driver.java:441)', 'com.faceboo
k.presto.operator.Driver.lambda$processFor$9(Driver.java:301)', 'com.facebook.presto.operator.Drive
r.tryWithLock(Driver.java:722)', 'com.facebook.presto.operator.Driver.processFor(Driver.java:294)',
'com.facebook.presto.execution.SqlTaskExecution$DriverSplitRunner.processFor(SqlTaskExecution.java:
1077)', 'com.facebook.presto.execution.executor.PrioritizedSplitRunner.process(PrioritizedSplitRunn
er.java:162)', 'com.facebook.presto.execution.executor.TaskExecutor$TaskRunner.run(TaskExecutor.jav
a:599)', 'com.facebook.presto.$gen.Presto_0_263_b9fd4d4____20211010_164639_1.run(Unknown Source)',
'java.base/java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1128)', 'java.
base/java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:628)', 'java.base/j
ava.lang.Thread.run(Thread.java:829)']}]

```

The above exception was the direct cause of the following exception:

Traceback (most recent call last):

```

File "/tmp/ipykernel_394536/722970930.py", line 15, in <module>
    for row in rs:
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/result.py",
line 381, in iterrows
    for row in self._fetchiter_impl():
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.py",
line 1788, in _fetchiter_impl
    row = fetchone(self, self.cursor)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.py",
line 960, in fetchone
    self.handle_exception(result, dbapi_cursor, e)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.py",
line 941, in handle_exception

```

```

        result.connection._handle_dbapi_exception(
            File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py", line 2023, in _handle_dbapi_exception
                util.raise_(
                    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/util/compat.py", line 207, in raise_
                        raise exception
                    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.py", line 955, in fetchone
                        row = dbapi_cursor.fetchone()
                    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 106, in fetchone
                        self._fetch_while(lambda: not self._data and self._state != self._STATE_FINISHED)
                    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 46, in _fetch_while
                        self._fetch_more()
                    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 308, in _fetch_more
                        self._process_response(self._requests_session.get(self._nextUri, **self._requests_kwargs))
                    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 349, in _process_response
                        raise DatabaseError(response_json['error'])
sqlalchemy.exc.DatabaseError: (pyhive.exc.DatabaseError) {'message': 'Query exceeded per-node user memory limit of 102.40MB [Allocated: 102.35MB, Delta: 128.26kB, Top Consumers: {HashBuilderOperator=102.35MB, ScanFilterAndProjectOperator=21.51MB, PartitionedOutputOperator=17.65MB}, Details: [{"taskId": "46.0.0", "reservation": "24.08MB", "topConsumers": [{"type": "HashBuilderOperator", "planNodeId": "3419", "reservations": ["1.52MB", "1.51MB", "1.51MB", "1.51MB", "1.51MB", "1.51MB", "1.51MB", "1.51MB", "1.50MB", "1.50MB", "1.50MB", "1.50MB", "1.50MB", "1.50MB", "1.50MB", "1.50MB", "1.50MB", "1.50MB"], "total": "24.08MB", "info": "INNER;PARTITIONED;"}]}, {"taskId": "10.0.0", "reservation": "13.52MB", "topConsumers": [{"type": "HashBuilderOperator", "planNodeId": "3358", "reservations": ["897.53kB", "885.27kB", "867.15kB", "866.97kB", "863.50kB", "862.79kB", "862.77kB", "862.46kB", "861.62kB", "861.29kB", "860.74kB", "859.46kB", "858.71kB", "858.52kB", "856.06kB", "855.61kB"], "total": "13.52MB", "info": "INNER;PARTITIONED;"}]}, {"taskId": "11.0.0", "reservation": "12.99MB", "topConsumers": [{"type": "HashBuilderOperator", "planNodeId": "3357", "reservations": ["841.78kB", "836.79kB", "836.24kB", "835.89kB", "835.03kB", "834.56kB", "833.72kB", "833.14kB", "832.16kB", "831.87kB", "831.63kB", "831.07kB", "829.19kB", "828.57kB", "827.44kB", "806.09kB"], "total": "12.99MB", "info": "INNER;PARTITIONED;"}]}]'}', 'errorCode': 131079, 'errorName': 'EXCEEDED_LOCAL_MEMORY_LIMIT', 'errorType': 'INSUFFICIENT_RESOURCES', 'boolean': False, 'failureInfo': {'type': 'com.facebook.presto.ExceededMemoryLimitException', 'message': 'Query exceeded per-node user memory limit of 102.40MB [Allocated: 102.35MB, Delta: 128.26kB, Top Consumers: {HashBuilderOperator=102.35MB, ScanFilterAndProjectOperator=21.51MB, PartitionedOutputOperator=17.65MB}, Details: [{"taskId": "46.0.0", "reservation": "24.08MB", "topConsumers": [{"type": "HashBuilderOperator", "planNodeId": "3419", "reservations": ["1.52MB", "1.51MB", "1.51MB", "1.51MB", "1.51MB", "1.51MB", "1.51MB", "1.51MB", "1.50MB", "1.50MB", "1.50MB", "1.50MB", "1.50MB", "1.50MB", "1.50MB", "1.50MB"], "total": "24.08MB", "info": "INNER;PARTITI

```

```
ONED;"}],{"taskId":"10.0.0","reservation":"13.52MB","topConsumers":[{"type":"HashBuilderOperator","planNodeId":"3358","reservations":["897.53kB","885.27kB","867.15kB","866.97kB","863.50kB","862.79kB","862.77kB","862.46kB","861.62kB","861.29kB","860.74kB","859.46kB","858.71kB","858.52kB","856.06kB","855.61kB"],"total":"13.52MB","info":"INNER;PARTITIONED;"}],{"taskId":"11.0.0","reservation":"12.99MB","topConsumers":[{"type":"HashBuilderOperator","planNodeId":"3357","reservations":["841.78kB","836.79kB","836.24kB","835.89kB","835.03kB","834.56kB","833.72kB","833.14kB","832.16kB","831.87kB","831.63kB","831.07kB","829.19kB","828.57kB","827.44kB","806.09kB"],"total":"12.99MB","info":"INNER;PARTITIONED;"}]]]', 'suppressed': [], 'stack': ['com.facebook.presto.ExceededMemoryLimitException.exceededLocalUserMemoryLimit(ExceededMemoryLimitException.java:49)', 'com.facebook.presto.memory.QueryContext.enforceUserMemoryLimit(QueryContext.java:496)', 'com.facebook.presto.memory.QueryContext.updateUserMemory(QueryContext.java:192)', 'com.facebook.presto.memory.QueryContext$QueryMemoryReservationHandler.reserveMemory(QueryContext.java:462)', 'com.facebook.presto.memory.context.RootAggregatedMemoryContext.updateBytes(RootAggregatedMemoryContext.java:37)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.SimpleLocalMemoryContext.setBytes(SimpleLocalMemoryContext.java:82)', 'com.facebook.presto.operator.OperatorContext$InternalLocalMemoryContext.setBytes(OperatorContext.java:672)', 'com.facebook.presto.operator.HashBuilderOperator.finishInput(HashBuilderOperator.java:503)', 'com.facebook.presto.operator.HashBuilderOperator.finish(HashBuilderOperator.java:454)', 'com.facebook.presto.operator.Driver.processInternal(Driver.java:441)', 'com.facebook.presto.operator.Driver.lambda$processFor$9(Driver.java:301)', 'com.facebook.presto.operator.Driver.tryWithLock(Driver.java:722)', 'com.facebook.presto.operator.Driver.processFor(Driver.java:294)', 'com.facebook.presto.execution.SqlTaskExecution$DriverSplitRunner.processFor(SqlTaskExecution.java:1077)', 'com.facebook.presto.execution.executor.PrioritizedSplitRunner.process(PrioritizedSplitRunner.java:162)', 'com.facebook.presto.execution.executor.TaskExecutor$TaskRunner.run(TaskExecutor.java:599)', 'com.facebook.presto.$gen.Presto_0_263_b9fd4d4_20211010_164639_1.run(Unknown Source)', 'java.base/java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1128)', 'java.base/java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:628)', 'java.base/java.lang.Thread.run(Thread.java:829)']}]}
```

(Background on this error at: <https://sqlalche.me/e/14/4xp6>) (<https://sqlalche.me/e/14/4xp6>)

SQL name: ./benchmark/tpcds/q65.sql...

```
=====
SELECT
  "s_store_name"
, "i_item_desc"
, "sc"."revenue"
, "i_current_price"
, "i_wholesale_cost"
```

```

, "i_brand"
FROM
  tpcds.tiny.store
, tpcds.tiny.item
, (
  SELECT
    "ss_store_sk"
  , "avg"("revenue") "ave"
  FROM
    (
      SELECT
        "ss_store_sk"
      , "ss_item_sk"
      , "sum"("ss_sales_price") "revenue"
      FROM
        tpcds.tiny.store_sales
      , tpcds.tiny.date_dim
      WHERE ("ss_sold_date_sk" = "d_date_sk")
        AND ("d_month_seq" BETWEEN 1176 AND (1176 + 11))
      GROUP BY "ss_store_sk", "ss_item_sk"
    ) sa
  GROUP BY "ss_store_sk"
) sb
, (
  SELECT
    "ss_store_sk"
  , "ss_item_sk"
  , "sum"("ss_sales_price") "revenue"
  FROM
    tpcds.tiny.store_sales
  , tpcds.tiny.date_dim
  WHERE ("ss_sold_date_sk" = "d_date_sk")
    AND ("d_month_seq" BETWEEN 1176 AND (1176 + 11))
  GROUP BY "ss_store_sk", "ss_item_sk"
) sc
WHERE ("sb"."ss_store_sk" = "sc"."ss_store_sk")
  AND ("sc"."revenue" <= (DECIMAL '0.1' * "sb"."ave"))
  AND ("s_store_sk" = "sc"."ss_store_sk")
  AND ("i_item_sk" = "sc"."ss_item_sk")
ORDER BY "s_store_name" ASC, "i_item_desc" ASC
LIMIT 100

```

Results: completed in 2 sec

+++++

```
[('ought', 'Everyday strings might wash for example about a pp.. Right physical specialists can b  
reak privately hungry journalists. Devices will not defend offices. Content, new projects should  
not se', '36.59', '2.40', '1.99', 'edu packscholar #1'), ('ough  
t', 'Grounds freeze previously then full rises. Familiar, big activities require as across a atti  
tudes. Nuclear movies gain t', '38.35', '8.74', '6.64', 'scholarbrand #3  
crazy things; so public ', '30.42', '9.27', '3.98', 'maxibrand #10  
)]
```

SQL name: ./benchmark/tpcds/q66.sql...

=====

SELECT

```
    "w_warehouse_name"  
, "w_warehouse_sq_ft"  
, "w_city"  
, "w_county"  
, "w_state"  
, "w_country"  
, "ship_carriers"  
, "year"  
, "sum"("jan_sales") "jan_sales"  
, "sum"("feb_sales") "feb_sales"  
, "sum"("mar_sales") "mar_sales"  
, "sum"("apr_sales") "apr_sales"  
, "sum"("may_sales") "may_sales"  
, "sum"("jun_sales") "jun_sales"  
, "sum"("jul_sales") "jul_sales"  
, "sum"("aug_sales") "aug_sales"  
, "sum"("sep_sales") "sep_sales"  
, "sum"("oct_sales") "oct_sales"  
, "sum"("nov_sales") "nov_sales"  
, "sum"("dec_sales") "dec_sales"  
, "sum"("jan_sales" / "w_warehouse_sq_ft") "jan_sales_per_sq_foot"  
, "sum"("feb_sales" / "w_warehouse_sq_ft") "feb_sales_per_sq_foot"  
, "sum"("mar_sales" / "w_warehouse_sq_ft") "mar_sales_per_sq_foot"  
, "sum"("apr_sales" / "w_warehouse_sq_ft") "apr_sales_per_sq_foot"  
, "sum"("may_sales" / "w_warehouse_sq_ft") "may_sales_per_sq_foot"  
, "sum"("jun_sales" / "w_warehouse_sq_ft") "jun_sales_per_sq_foot"
```

```

, "sum" (("jul_sales" / "w_warehouse_sq_ft")) "jul_sales_per_sq_foot"
, "sum" (("aug_sales" / "w_warehouse_sq_ft")) "aug_sales_per_sq_foot"
, "sum" (("sep_sales" / "w_warehouse_sq_ft")) "sep_sales_per_sq_foot"
, "sum" (("oct_sales" / "w_warehouse_sq_ft")) "oct_sales_per_sq_foot"
, "sum" (("nov_sales" / "w_warehouse_sq_ft")) "nov_sales_per_sq_foot"
, "sum" (("dec_sales" / "w_warehouse_sq_ft")) "dec_sales_per_sq_foot"
, "sum" ("jan_net") "jan_net"
, "sum" ("feb_net") "feb_net"
, "sum" ("mar_net") "mar_net"
, "sum" ("apr_net") "apr_net"
, "sum" ("may_net") "may_net"
, "sum" ("jun_net") "jun_net"
, "sum" ("jul_net") "jul_net"
, "sum" ("aug_net") "aug_net"
, "sum" ("sep_net") "sep_net"
, "sum" ("oct_net") "oct_net"
, "sum" ("nov_net") "nov_net"
, "sum" ("dec_net") "dec_net"
FROM
(
    SELECT
        "w_warehouse_name"
        , "w_warehouse_sq_ft"
        , "w_city"
        , "w_county"
        , "w_state"
        , "w_country"
        , "concat"("concat"('DHL', ','), 'BARIAN') "ship_carriers"
        , "d_year" "YEAR"
        , "sum"((CASE WHEN ("d_moy" = 1) THEN ("ws_ext_sales_price" * "ws_quantity") ELSE 0 END))
"jan_sales"
        , "sum"((CASE WHEN ("d_moy" = 2) THEN ("ws_ext_sales_price" * "ws_quantity") ELSE 0 END))
"feb_sales"
        , "sum"((CASE WHEN ("d_moy" = 3) THEN ("ws_ext_sales_price" * "ws_quantity") ELSE 0 END))
"mar_sales"
        , "sum"((CASE WHEN ("d_moy" = 4) THEN ("ws_ext_sales_price" * "ws_quantity") ELSE 0 END))
"apr_sales"
        , "sum"((CASE WHEN ("d_moy" = 5) THEN ("ws_ext_sales_price" * "ws_quantity") ELSE 0 END))
"may_sales"
        , "sum"((CASE WHEN ("d_moy" = 6) THEN ("ws_ext_sales_price" * "ws_quantity") ELSE 0 END))
"jun_sales"
        , "sum"((CASE WHEN ("d_moy" = 7) THEN ("ws_ext_sales_price" * "ws_quantity") ELSE 0 END))
"jul_sales"

```

```

        , "sum"((CASE WHEN ("d_moy" = 8) THEN ("ws_ext_sales_price" * "ws_quantity") ELSE 0 END))
"aug_sales"
        , "sum"((CASE WHEN ("d_moy" = 9) THEN ("ws_ext_sales_price" * "ws_quantity") ELSE 0 END))
"sep_sales"
        , "sum"((CASE WHEN ("d_moy" = 10) THEN ("ws_ext_sales_price" * "ws_quantity") ELSE 0 END))
"oct_sales"
        , "sum"((CASE WHEN ("d_moy" = 11) THEN ("ws_ext_sales_price" * "ws_quantity") ELSE 0 END))
"nov_sales"
        , "sum"((CASE WHEN ("d_moy" = 12) THEN ("ws_ext_sales_price" * "ws_quantity") ELSE 0 END))
"dec_sales"
        , "sum"((CASE WHEN ("d_moy" = 1) THEN ("ws_net_paid" * "ws_quantity") ELSE 0 END)) "jan_ne
t"
        , "sum"((CASE WHEN ("d_moy" = 2) THEN ("ws_net_paid" * "ws_quantity") ELSE 0 END)) "feb_ne
t"
        , "sum"((CASE WHEN ("d_moy" = 3) THEN ("ws_net_paid" * "ws_quantity") ELSE 0 END)) "mar_ne
t"
        , "sum"((CASE WHEN ("d_moy" = 4) THEN ("ws_net_paid" * "ws_quantity") ELSE 0 END)) "apr_ne
t"
        , "sum"((CASE WHEN ("d_moy" = 5) THEN ("ws_net_paid" * "ws_quantity") ELSE 0 END)) "may_ne
t"
        , "sum"((CASE WHEN ("d_moy" = 6) THEN ("ws_net_paid" * "ws_quantity") ELSE 0 END)) "jun_ne
t"
        , "sum"((CASE WHEN ("d_moy" = 7) THEN ("ws_net_paid" * "ws_quantity") ELSE 0 END)) "jul_ne
t"
        , "sum"((CASE WHEN ("d_moy" = 8) THEN ("ws_net_paid" * "ws_quantity") ELSE 0 END)) "aug_ne
t"
        , "sum"((CASE WHEN ("d_moy" = 9) THEN ("ws_net_paid" * "ws_quantity") ELSE 0 END)) "sep_ne
t"
        , "sum"((CASE WHEN ("d_moy" = 10) THEN ("ws_net_paid" * "ws_quantity") ELSE 0 END)) "oct_ne
t"
        , "sum"((CASE WHEN ("d_moy" = 11) THEN ("ws_net_paid" * "ws_quantity") ELSE 0 END)) "nov_ne
t"
        , "sum"((CASE WHEN ("d_moy" = 12) THEN ("ws_net_paid" * "ws_quantity") ELSE 0 END)) "dec_ne
t"
FROM
    tpcds.tiny.web_sales
    , tpcds.tiny.warehouse
    , tpcds.tiny.date_dim
    , tpcds.tiny.time_dim
    , tpcds.tiny.ship_mode
WHERE ("ws_warehouse_sk" = "w_warehouse_sk")
    AND ("ws_sold_date_sk" = "d_date_sk")
    AND ("ws_sold_time_sk" = "t_time_sk")

```

```

        AND ("ws_ship_mode_sk" = "sm_ship_mode_sk")
        AND ("d_year" = 2001)
        AND ("t_time" BETWEEN 30838 AND (30838 + 28800))
        AND ("sm_carrier" IN ('DHL' , 'BARIAN'))
    GROUP BY "w_warehouse_name", "w_warehouse_sq_ft", "w_city", "w_county", "w_state", "w_count
ry", "d_year"
    UNION ALL
    SELECT
        "w_warehouse_name"
    , "w_warehouse_sq_ft"
    , "w_city"
    , "w_county"
    , "w_state"
    , "w_country"
    , "concat"("concat"('DHL', ','), 'BARIAN') "ship_carriers"
    , "d_year" "YEAR"
    , "sum"((CASE WHEN ("d_moy" = 1) THEN ("cs_sales_price" * "cs_quantity") ELSE 0 END)) "jan_
sales"
    , "sum"((CASE WHEN ("d_moy" = 2) THEN ("cs_sales_price" * "cs_quantity") ELSE 0 END)) "feb_
sales"
    , "sum"((CASE WHEN ("d_moy" = 3) THEN ("cs_sales_price" * "cs_quantity") ELSE 0 END)) "mar_
sales"
    , "sum"((CASE WHEN ("d_moy" = 4) THEN ("cs_sales_price" * "cs_quantity") ELSE 0 END)) "apr_
sales"
    , "sum"((CASE WHEN ("d_moy" = 5) THEN ("cs_sales_price" * "cs_quantity") ELSE 0 END)) "may_
sales"
    , "sum"((CASE WHEN ("d_moy" = 6) THEN ("cs_sales_price" * "cs_quantity") ELSE 0 END)) "jun_
sales"
    , "sum"((CASE WHEN ("d_moy" = 7) THEN ("cs_sales_price" * "cs_quantity") ELSE 0 END)) "jul_
sales"
    , "sum"((CASE WHEN ("d_moy" = 8) THEN ("cs_sales_price" * "cs_quantity") ELSE 0 END)) "aug_
sales"
    , "sum"((CASE WHEN ("d_moy" = 9) THEN ("cs_sales_price" * "cs_quantity") ELSE 0 END)) "sep_
sales"
    , "sum"((CASE WHEN ("d_moy" = 10) THEN ("cs_sales_price" * "cs_quantity") ELSE 0 END)) "oct_
sales"
    , "sum"((CASE WHEN ("d_moy" = 11) THEN ("cs_sales_price" * "cs_quantity") ELSE 0 END)) "nov_
sales"
    , "sum"((CASE WHEN ("d_moy" = 12) THEN ("cs_sales_price" * "cs_quantity") ELSE 0 END)) "dec_
sales"
    , "sum"((CASE WHEN ("d_moy" = 1) THEN ("cs_net_paid_inc_tax" * "cs_quantity") ELSE 0 END))
"jan_net"
    , "sum"((CASE WHEN ("d_moy" = 2) THEN ("cs_net_paid_inc_tax" * "cs_quantity") ELSE 0 END))

```



```

"feb_net"
    , "sum"((CASE WHEN ("d_moy" = 3) THEN ("cs_net_paid_inc_tax" * "cs_quantity") ELSE 0 END))
"mar_net"
    , "sum"((CASE WHEN ("d_moy" = 4) THEN ("cs_net_paid_inc_tax" * "cs_quantity") ELSE 0 END))
"apr_net"
    , "sum"((CASE WHEN ("d_moy" = 5) THEN ("cs_net_paid_inc_tax" * "cs_quantity") ELSE 0 END))
"may_net"
    , "sum"((CASE WHEN ("d_moy" = 6) THEN ("cs_net_paid_inc_tax" * "cs_quantity") ELSE 0 END))
"jun_net"
    , "sum"((CASE WHEN ("d_moy" = 7) THEN ("cs_net_paid_inc_tax" * "cs_quantity") ELSE 0 END))
"jul_net"
    , "sum"((CASE WHEN ("d_moy" = 8) THEN ("cs_net_paid_inc_tax" * "cs_quantity") ELSE 0 END))
"aug_net"
    , "sum"((CASE WHEN ("d_moy" = 9) THEN ("cs_net_paid_inc_tax" * "cs_quantity") ELSE 0 END))
"sep_net"
    , "sum"((CASE WHEN ("d_moy" = 10) THEN ("cs_net_paid_inc_tax" * "cs_quantity") ELSE 0 END))
"oct_net"
    , "sum"((CASE WHEN ("d_moy" = 11) THEN ("cs_net_paid_inc_tax" * "cs_quantity") ELSE 0 END))
"nov_net"
    , "sum"((CASE WHEN ("d_moy" = 12) THEN ("cs_net_paid_inc_tax" * "cs_quantity") ELSE 0 END))
"dec_net"
    FROM
        tpcds.tiny.catalog_sales
    , tpcds.tiny.warehouse
    , tpcds.tiny.date_dim
    , tpcds.tiny.time_dim
    , tpcds.tiny.ship_mode
    WHERE ("cs_warehouse_sk" = "w_warehouse_sk")
        AND ("cs_sold_date_sk" = "d_date_sk")
        AND ("cs_sold_time_sk" = "t_time_sk")
        AND ("cs_ship_mode_sk" = "sm_ship_mode_sk")
        AND ("d_year" = 2001)
        AND ("t_time" BETWEEN 30838 AND (30838 + 28800))
        AND ("sm_carrier" IN ('DHL' , 'BARIAN'))
    GROUP BY "w_warehouse_name", "w_warehouse_sq_ft", "w_city", "w_county", "w_state", "w_count
ry", "d_year"
    ) x
GROUP BY "w_warehouse_name", "w_warehouse_sq_ft", "w_city", "w_county", "w_state", "w_country",
"ship_carriers", "year"
ORDER BY "w_warehouse_name" ASC
LIMIT 100

```

Results: completed in 2 sec

+++++

```
[('Conventional childr', 977787, 'Midway', 'Williamson County', 'TN', 'United States', 'DHL, BARIAN', 2001, '661407.18', '766942.78', '307720.05', '333390.59', '1904937.34', '2308974.68', '1310866.26', '2298210.15', '1497771.61', '2900278.47', '5213564.64', '2706805.34', '0.68', '0.78', '0.32', '0.35', '1.94', '2.36', '1.34', '2.35', '1.53', '2.97', '5.33', '2.77', '7554063.29', '8213766.03', '7574329.97', '4142886.32', '3575413.31', '4126236.48', '5015953.55', '9665997.01', '10823343.90', '13418884.62', '23331407.18', '19502364.49')]
```

SQL name: ./benchmark/tpcds/q67.sql...

=====

SELECT *

FROM

(

SELECT

"i_category"

, "i_class"

, "i_brand"

, "i_product_name"

, "d_year"

, "d_qoy"

, "d_moy"

, "s_store_id"

, "sumsales"

, "rank"() OVER (PARTITION BY "i_category" ORDER BY "sumsales" DESC) "rk"

FROM

(

SELECT

"i_category"

, "i_class"

, "i_brand"

, "i_product_name"

, "d_year"

, "d_qoy"

, "d_moy"

, "s_store_id"

, "sum"(COALESCE(("ss_sales_price" * "ss_quantity"), 0)) "sumsales"

FROM

tpcds.tiny.store_sales

```

        , tpcds.tiny.date_dim
        , tpcds.tiny.store
        , tpcds.tiny.item
    WHERE ("ss_sold_date_sk" = "d_date_sk")
        AND ("ss_item_sk" = "i_item_sk")
        AND ("ss_store_sk" = "s_store_sk")
        AND ("d_month_seq" BETWEEN 1200 AND (1200 + 11))
    GROUP BY ROLLUP (i_category, i_class, i_brand, i_product_name, d_year, d_qoy, d_moy, s_store_id)
    ) dw1
    ) dw2
    WHERE ("rk" <= 100)
    ORDER BY "i_category" ASC, "i_class" ASC, "i_brand" ASC, "i_product_name" ASC, "d_year" ASC, "d_qoy" ASC, "d_moy" ASC, "s_store_id" ASC, "sumsales" ASC, "rk" ASC
    LIMIT 100

```

Results: completed in 2 sec

+++++

```

[('Books', 'arts', 'amalgmaxi #12', None, None, None, None, None, '106170.65', 29), ('Books', 'arts', 'business', 'importomaxi #12', None, None, None, None, '68169.94', 59), ('Books', 'importomaxi #9', 'esecallyn stought', '2000', None, None, None, '73055.57', 46), ('Books', 'business', 'esecallyn stought', '73055.57', 46)]

```

SQL name: ./benchmark/tpcds/q68.sql...

=====

```

SELECT
    "c_last_name"
    , "c_first_name"
    , "ca_city"
    , "bought_city"
    , "ss_ticket_number"
    , "extended_price"
    , "extended_tax"

```

```

, "list_price"
FROM
(
  SELECT
    "ss_ticket_number"
  , "ss_customer_sk"
  , "ca_city" "bought_city"
  , "sum"("ss_ext_sales_price") "extended_price"
  , "sum"("ss_ext_list_price") "list_price"
  , "sum"("ss_ext_tax") "extended_tax"
  FROM
    tpcds.tiny.store_sales
  , tpcds.tiny.date_dim
  , tpcds.tiny.store
  , tpcds.tiny.household_demographics
  , tpcds.tiny.customer_address
  WHERE ("store_sales"."ss_sold_date_sk" = "date_dim"."d_date_sk")
    AND ("store_sales"."ss_store_sk" = "store"."s_store_sk")
    AND ("store_sales"."ss_hdemo_sk" = "household_demographics"."hd_demo_sk")
    AND ("store_sales"."ss_addr_sk" = "customer_address"."ca_address_sk")
    AND ("date_dim"."d_dom" BETWEEN 1 AND 2)
    AND (("household_demographics"."hd_dep_count" = 4)
      OR ("household_demographics"."hd_vehicle_count" = 3))
    AND ("date_dim"."d_year" IN (1999 , (1999 + 1) , (1999 + 2)))
    AND ("store"."s_city" IN ('Midway' , 'Fairview'))
  GROUP BY "ss_ticket_number", "ss_customer_sk", "ss_addr_sk", "ca_city"
) dn
, tpcds.tiny.customer
, tpcds.tiny.customer_address current_addr
WHERE ("ss_customer_sk" = "c_customer_sk")
  AND ("customer"."c_current_addr_sk" = "current_addr"."ca_address_sk")
  AND ("current_addr"."ca_city" <> "bought_city")
ORDER BY "c_last_name" ASC, "ss_ticket_number" ASC
LIMIT 100

```

Results: completed in 2 sec

+++++

```

[('Adams', 'Catherine', 'Riverdale', 'Summit', 2987, '25044.8
2', '1202.93', '62436.70'), ('Bailey', 'Robert', 'Mount Oli
ve', 'Woodland', 8841, '17281.74', '1253.32', '45966.38'), ('Baker', 'Jo
y', 'Highland Park', 'Mount Zion', 4416, '24704.79', '957.88', '36746.67'), ('Ba

```

```

tson                                ', 'Gina                                ', 'Enterprise', 'Andover', 1347, '39883.83',
'1540.86', '66458.59'), ('Benitez                                ', 'Michele                                ', 'Newport', 'Gr
eenville', 4976, '9996.21', '471.37', '37443.67')]
```

SQL name: ./benchmark/tpcds/q69.sql...

=====

```

SELECT
    "cd_gender"
, "cd_marital_status"
, "cd_education_status"
, "count"(*) "cnt1"
, "cd_purchase_estimate"
, "count"(*) "cnt2"
, "cd_credit_rating"
, "count"(*) "cnt3"
FROM
    tpcds.tiny.customer c
, tpcds.tiny.customer_address ca
, tpcds.tiny.customer_demographics
WHERE ("c"."c_current_addr_sk" = "ca"."ca_address_sk")
    AND ("ca_state" IN ('KY', 'GA', 'NM'))
    AND ("cd_demo_sk" = "c"."c_current_cdemo_sk")
    AND (EXISTS (
        SELECT *
        FROM
            tpcds.tiny.store_sales
        , tpcds.tiny.date_dim
        WHERE ("c"."c_customer_sk" = "ss_customer_sk")
            AND ("ss_sold_date_sk" = "d_date_sk")
            AND ("d_year" = 2001)
            AND ("d_moy" BETWEEN 4 AND (4 + 2))
    ))
    AND (NOT (EXISTS (
        SELECT *
        FROM
            tpcds.tiny.web_sales
        , tpcds.tiny.date_dim
        WHERE ("c"."c_customer_sk" = "ws_bill_customer_sk")
            AND ("ws_sold_date_sk" = "d_date_sk")
            AND ("d_year" = 2001)
            AND ("d_moy" BETWEEN 4 AND (4 + 2))
    )))
```



```
l": "3.61kB"}]]}, {"taskId": "8.0.0", "reservation": "2.70MB", "topConsumers": [{"type": "HashBuilderOperator", "planNodeId": "292", "reservations": ["128.62kB", "128.60kB", "128.55kB", "128.55kB", "128.55kB", "128.51kB", "128.51kB", "128.51kB", "128.51kB", "128.49kB", "128.49kB", "128.49kB", "128.47kB", "128.44kB", "128.42kB", "128.40kB"], "total": "2.01MB", "info": "INNER;PARTITIONED;"}, {"type": "HashAggregationOperator", "planNodeId": "2201", "reservations": ["353.04kB", "353.04kB", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B"], "total": "706.08kB", "info": "PARTIAL;"}]]}], 'errorCode': 131079, 'errorMessage': 'EXCEEDED_LOCAL_MEMORY_LIMIT', 'errorType': 'INSUFFICIENT_RESOURCES', 'boolean': false, 'failureInfo': {'type': 'com.facebook.presto.ExceededMemoryLimitException', 'message': 'Query exceeded per-node user memory limit of 102.40MB [Allocated: 102.38MB, Delta: 27.93kB, Top Consumers: {HashBuilderOperator=102.38MB, PartitionedOutputOperator=5.92MB, ScanFilterAndProjectOperator=2.51MB}, Details: [{"taskId": "3.0.0", "reservation": "100.37MB", "topConsumers": [{"type": "HashBuilderOperator", "planNodeId": "4", "reservations": ["6.46MB", "6.45MB", "6.44MB", "6.44MB", "6.44MB", "6.43MB", "6.43MB", "6.43MB", "6.43MB", "6.42MB", "6.42MB", "6.41MB", "6.40MB", "5.98MB", "5.76MB", "5.73MB", "5.72MB"], "total": "100.37MB", "info": "INNER;PARTITIONED;"}]}, {"taskId": "7.0.0", "reservation": "3.76MB", "topConsumers": [{"type": "PartitionedOutputOperator", "planNodeId": "2381", "reservations": ["1.25MB", "1.25MB", "1.25MB"], "total": "3.75MB"}, {"type": "ScanFilterAndProjectOperator", "planNodeId": "2381", "reservations": ["1.20kB", "1.20kB", "1.20kB"], "total": "3.61kB"}]}, {"taskId": "8.0.0", "reservation": "2.70MB", "topConsumers": [{"type": "HashBuilderOperator", "planNodeId": "292", "reservations": ["128.62kB", "128.60kB", "128.55kB", "128.55kB", "128.55kB", "128.51kB", "128.51kB", "128.51kB", "128.51kB", "128.49kB", "128.49kB", "128.49kB", "128.47kB", "128.44kB", "128.42kB", "128.40kB"], "total": "2.01MB", "info": "INNER;PARTITIONED;"}, {"type": "HashAggregationOperator", "planNodeId": "2201", "reservations": ["353.04kB", "353.04kB", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B"], "total": "706.08kB", "info": "PARTIAL;"}]]}], 'suppressed': [], 'stack': ['com.facebook.presto.ExceededMemoryLimitException.exceededLocalUserMemoryLimit(ExceededMemoryLimitException.java:49)', 'com.facebook.presto.memory.QueryContext.enforceUserMemoryLimit(QueryContext.java:496)', 'com.facebook.presto.memory.QueryContext.updateUserMemory(QueryContext.java:192)', 'com.facebook.presto.memory.QueryContext$QueryMemoryReservationHandler.reserveMemory(QueryContext.java:462)', 'com.facebook.presto.memory.context.RootAggregatedMemoryContext.updateBytes(RootAggregatedMemoryContext.java:37)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.SimpleLocalMemoryContext.setBytes(SimpleLocalMemoryContext.java:82)', 'com.facebook.presto.operator.OperatorContext$InternalLocalMemoryContext.setBytes(OperatorContext.java:672)', 'com.facebook.presto.operator.HashBuilderOperator.updateIndex(HashBuilderOperator.java:358)', 'com.facebook.presto.operator.HashBuilderOperator.addInput(HashBuilderOperator.java:345)', 'com.facebook.presto.operator.Driver.processInternal(Driver.java:428)', 'com.facebook.presto.operator.Driver.lambda$processFor$9(Driver.java:301)', 'com.facebook.presto.operator.Driver.tryWithLock(Driver.java:722)', 'com.facebook.presto.operator.Driver.processFor(Driver.java:294)', 'com.facebook.presto.execution.SqlTaskExecution$DriverSplitRunner.processFor(SqlTaskExecution.java:1077)', 'com.facebook.presto.execution.executor.PrioritizedSplitRunner.process(PrioritizedSplitRunner.java:162)', 'com.facebook.presto.execution.executor.TaskExecutor$TaskRunner.run(TaskExecuto
```

```
r.java:599)', 'com.facebook.presto.$gen.Presto_0_263_b9fd4d4____20211010_164639_1.run(Unknown Source)', 'java.base/java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1128)', 'java.base/java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:628)', 'java.base/java.lang.Thread.run(Thread.java:829)']}]}
```

The above exception was the direct cause of the following exception:

Traceback (most recent call last):

```
File "/tmp/ipykernel_394536/722970930.py", line 15, in <module>
    for row in rs:
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/result.py", line 381, in iterrows
    for row in self._fetchiter_impl():
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.py", line 1788, in _fetchiter_impl
    row = fetchone(self, self.cursor)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.py", line 960, in fetchone
    self.handle_exception(result, dbapi_cursor, e)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.py", line 941, in handle_exception
    result.connection._handle_dbapi_exception(
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py", line 2023, in _handle_dbapi_exception
    util.raise_(
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/util/compat.py", line 207, in raise_
    raise exception
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.py", line 955, in fetchone
    row = dbapi_cursor.fetchone()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 106, in fetchone
    self._fetch_while(lambda: not self._data and self._state != self._STATE_FINISHED)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 46, in _fetch_while
    self._fetch_more()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 308, in _fetch_more
    self._process_response(self._requests_session.get(self._nextUri, **self._requests_kwargs))
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 349, in _process_response
    raise DatabaseError(response_json['error'])
```



```
sqlalchemy.exc.DatabaseError: (pyhive.exc.DatabaseError) {'message': 'Query exceeded per-node user memory limit of 102.40MB [Allocated: 102.38MB, Delta: 27.93kB, Top Consumers: {HashBuilderOperator=102.38MB, PartitionedOutputOperator=5.92MB, ScanFilterAndProjectOperator=2.51MB}, Details: [{"taskId": "3.0.0", "reservation": "100.37MB", "topConsumers": [{"type": "HashBuilderOperator", "planNodeId": "4", "reservations": ["6.46MB", "6.45MB", "6.44MB", "6.44MB", "6.44MB", "6.43MB", "6.43MB", "6.43MB", "6.42MB", "6.42MB", "6.41MB", "6.40MB", "5.98MB", "5.76MB", "5.73MB", "5.72MB"], "total": "100.37MB", "info": "INNER;PARTITIONED;" }], {"taskId": "7.0.0", "reservation": "3.76MB", "topConsumers": [{"type": "PartitionedOutputOperator", "planNodeId": "2381", "reservations": ["1.25MB", "1.25MB", "1.25MB"], "total": "3.75MB"}, {"type": "ScanFilterAndProjectOperator", "planNodeId": "2381", "reservations": ["1.20kB", "1.20kB", "1.20kB"], "total": "3.61kB"}]}, {"taskId": "8.0.0", "reservation": "2.70MB", "topConsumers": [{"type": "HashBuilderOperator", "planNodeId": "292", "reservations": ["128.62kB", "128.60kB", "128.55kB", "128.55kB", "128.55kB", "128.51kB", "128.51kB", "128.51kB", "128.51kB", "128.49kB", "128.49kB", "128.49kB", "128.47kB", "128.44kB", "128.42kB", "128.40kB"], "total": "2.01MB", "info": "INNER;PARTITIONED;" }, {"type": "HashAggregationOperator", "planNodeId": "2201", "reservations": ["353.04kB", "353.04kB", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B"], "total": "706.08kB", "info": "PARTIAL;}"]}]'}, 'errorCode': 131079, 'errorName': 'EXCEEDED_LOCAL_MEMORY_LIMIT', 'errorMessage': 'INSUFFICIENT_RESOURCES', 'boolean': False, 'failureInfo': {'type': 'com.facebook.presto.ExceededMemoryLimitException', 'message': 'Query exceeded per-node user memory limit of 102.40MB [Allocated: 102.38MB, Delta: 27.93kB, Top Consumers: {HashBuilderOperator=102.38MB, PartitionedOutputOperator=5.92MB, ScanFilterAndProjectOperator=2.51MB}, Details: [{"taskId": "3.0.0", "reservation": "100.37MB", "topConsumers": [{"type": "HashBuilderOperator", "planNodeId": "4", "reservations": ["6.46MB", "6.45MB", "6.44MB", "6.44MB", "6.44MB", "6.43MB", "6.43MB", "6.43MB", "6.42MB", "6.42MB", "6.41MB", "6.40MB", "5.98MB", "5.76MB", "5.73MB", "5.72MB"], "total": "100.37MB", "info": "INNER;PARTITIONED;" }], {"taskId": "7.0.0", "reservation": "3.76MB", "topConsumers": [{"type": "PartitionedOutputOperator", "planNodeId": "2381", "reservations": ["1.25MB", "1.25MB", "1.25MB"], "total": "3.75MB"}, {"type": "ScanFilterAndProjectOperator", "planNodeId": "2381", "reservations": ["1.20kB", "1.20kB", "1.20kB"], "total": "3.61kB"}]}, {"taskId": "8.0.0", "reservation": "2.70MB", "topConsumers": [{"type": "HashBuilderOperator", "planNodeId": "292", "reservations": ["128.62kB", "128.60kB", "128.55kB", "128.55kB", "128.55kB", "128.51kB", "128.51kB", "128.51kB", "128.51kB", "128.49kB", "128.49kB", "128.49kB", "128.47kB", "128.44kB", "128.42kB", "128.40kB"], "total": "2.01MB", "info": "INNER;PARTITIONED;" }, {"type": "HashAggregationOperator", "planNodeId": "2201", "reservations": ["353.04kB", "353.04kB", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B", "0B"], "total": "706.08kB", "info": "PARTIAL;}"]}]'}, 'suppressed': [], 'stack': ['com.facebook.presto.ExceededMemoryLimitException.exceededLocalUserMemoryLimit(ExceededMemoryLimitException.java:49)', 'com.facebook.presto.memory.QueryContext.enforceUserMemoryLimit(QueryContext.java:496)', 'com.facebook.presto.memory.QueryContext.updateUserMemory(QueryContext.java:192)', 'com.facebook.presto.memory.QueryContext$QueryMemoryReservationHandler.reserveMemory(QueryContext.java:462)', 'com.facebook.presto.memory.context.RootAggregatedMemoryContext.updateBytes(RootAggregatedMemoryContext.java:37)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.SimpleLocalMemoryContext.se
```

```
tBytes(SimpleLocalMemoryContext.java:82)', 'com.facebook.presto.operator.OperatorContext$Internal
LocalMemoryContext.setBytes(OperatorContext.java:672)', 'com.facebook.presto.operator.HashBuilder
Operator.updateIndex(HashBuilderOperator.java:358)', 'com.facebook.presto.operator.HashBuilderOpe
rator.addInput(HashBuilderOperator.java:345)', 'com.facebook.presto.operator.Driver.processIntern
al(Driver.java:428)', 'com.facebook.presto.operator.Driver.lambda$processFor$9(Driver.java:301)',
'com.facebook.presto.operator.Driver.tryWithLock(Driver.java:722)', 'com.facebook.presto.operato
r.Driver.processFor(Driver.java:294)', 'com.facebook.presto.execution.SqlTaskExecution$DriverSpli
tRunner.processFor(SqlTaskExecution.java:1077)', 'com.facebook.presto.execution.executor.Prioriti
zedSplitRunner.process(PrioritizedSplitRunner.java:162)', 'com.facebook.presto.execution.executo
r.TaskExecutor$TaskRunner.run(TaskExecutor.java:599)', 'com.facebook.presto.$gen.Presto_0_263_b9f
dfd4____20211010_164639_1.run(Unknown Source)', 'java.base/java.util.concurrent.ThreadPoolExecuto
r.runWorker(ThreadPoolExecutor.java:1128)', 'java.base/java.util.concurrent.ThreadPoolExecutor$Wo
rker.run(ThreadPoolExecutor.java:628)', 'java.base/java.lang.Thread.run(Thread.java:829)']}]}
```

(Background on this error at: <https://sqlalche.me/e/14/4xp6>) (<https://sqlalche.me/e/14/4xp6>)

SQL name: ./benchmark/tpcds/q70.sql...

=====

```
SELECT
  "sum"("ss_net_profit") "total_sum"
, "s_state"
, "s_county"
, (GROUPING ("s_state") + GROUPING ("s_county")) "lochierarchy"
, "rank"() OVER (PARTITION BY (GROUPING ("s_state") + GROUPING ("s_county")), (CASE WHEN (GROUPIN
G ("s_county") = 0) THEN "s_state" END) ORDER BY "sum"("ss_net_profit") DESC) "rank_within_paren
t"
FROM
  tpcds.tiny.store_sales
, tpcds.tiny.date_dim d1
, tpcds.tiny.store
WHERE ("d1"."d_month_seq" BETWEEN 1200 AND (1200 + 11))
  AND ("d1"."d_date_sk" = "ss_sold_date_sk")
  AND ("s_store_sk" = "ss_store_sk")
  AND ("s_state" IN (
    SELECT "s_state"
    FROM
      (
        SELECT
          "s_state" "s_state"
        , "rank"() OVER (PARTITION BY "s_state" ORDER BY "sum"("ss_net_profit") DESC) "ranking"
        FROM
          tpcds.tiny.store_sales
```

```

        , tpcds.tiny.store
        , tpcds.tiny.date_dim
    WHERE ("d_month_seq" BETWEEN 1200 AND (1200 + 11))
        AND ("d_date_sk" = "ss_sold_date_sk")
        AND ("s_store_sk" = "ss_store_sk")
    GROUP BY "s_state"
    ) tmp1
    WHERE ("ranking" <= 5)
))
GROUP BY ROLLUP (s_state, s_county)
ORDER BY "lochierarchy" DESC, (CASE WHEN ("lochierarchy" = 0) THEN "s_state" END) ASC, "rank_with_in_parent" ASC
LIMIT 100

```

Results: completed in 2 sec

+++++

```

[('-18926197.59', None, None, 2, 1), ('-18926197.59', 'TN', None, 1, 1), ('-18926197.59', 'TN', 'Williamson County', 0, 1)]

```

SQL name: ./benchmark/tpcds/q71.sql...

=====

```

SELECT
    "i_brand_id" "brand_id"
    , "i_brand" "brand"
    , "t_hour"
    , "t_minute"
    , "sum"("ext_price") "ext_price"
FROM
    tpcds.tiny.item
    , (
        SELECT
            "ws_ext_sales_price" "ext_price"
            , "ws_sold_date_sk" "sold_date_sk"
            , "ws_item_sk" "sold_item_sk"
            , "ws_sold_time_sk" "time_sk"
        FROM
            tpcds.tiny.web_sales
            , tpcds.tiny.date_dim
        WHERE ("d_date_sk" = "ws_sold_date_sk")
    )

```

```

        AND ("d_moy" = 11)
        AND ("d_year" = 1999)
UNION ALL      SELECT
        "cs_ext_sales_price" "ext_price"
        , "cs_sold_date_sk" "sold_date_sk"
        , "cs_item_sk" "sold_item_sk"
        , "cs_sold_time_sk" "time_sk"
FROM
        tpcds.tiny.catalog_sales
        , tpcds.tiny.date_dim
WHERE ("d_date_sk" = "cs_sold_date_sk")
        AND ("d_moy" = 11)
        AND ("d_year" = 1999)
UNION ALL      SELECT
        "ss_ext_sales_price" "ext_price"
        , "ss_sold_date_sk" "sold_date_sk"
        , "ss_item_sk" "sold_item_sk"
        , "ss_sold_time_sk" "time_sk"
FROM
        tpcds.tiny.store_sales
        , tpcds.tiny.date_dim
WHERE ("d_date_sk" = "ss_sold_date_sk")
        AND ("d_moy" = 11)
        AND ("d_year" = 1999)
) tmp
, tpcds.tiny.time_dim
WHERE ("sold_item_sk" = "i_item_sk")
        AND ("i_manager_id" = 1)
        AND ("time_sk" = "t_time_sk")
        AND (("t_meal_time" = 'breakfast')
        OR ("t_meal_time" = 'dinner'))
GROUP BY "i_brand", "i_brand_id", "t_hour", "t_minute"
ORDER BY "ext_price" DESC, "i_brand_id" ASC

```

Results: completed in 2 sec

+++++

```

[(7008009, 'namelessbrand #9', 18, 6, '13102.66'), (10010013, 'un
ivamalgamalg #13', 9, 28, '4239.00'), (1002002, 'importoamalg #2
', 19, 41, '4005.60'), (6007003, 'brandcorp #3', 17, 58, '383
1.52'), (6007003, 'brandcorp #3', 9, 46, '2555.64')]

```

SQL name: ./benchmark/tpcds/q72.sql...

=====

```
SELECT
  "i_item_desc"
, "w_warehouse_name"
, "d1"."d_week_seq"
, "sum"((CASE WHEN ("p_promo_sk" IS NULL) THEN 1 ELSE 0 END)) "no_promo"
, "sum"((CASE WHEN ("p_promo_sk" IS NOT NULL) THEN 1 ELSE 0 END)) "promo"
, "count"(*) "total_cnt"
FROM
  (((((((tpcds.tiny.catalog_sales
INNER JOIN tpcds.tiny.inventory ON ("cs_item_sk" = "inv_item_sk"))
INNER JOIN tpcds.tiny.warehouse ON ("w_warehouse_sk" = "inv_warehouse_sk"))
INNER JOIN tpcds.tiny.item ON ("i_item_sk" = "cs_item_sk"))
INNER JOIN tpcds.tiny.customer_demographics ON ("cs_bill_cdemo_sk" = "cd_demo_sk"))
INNER JOIN tpcds.tiny.household_demographics ON ("cs_bill_hdemo_sk" = "hd_demo_sk"))
INNER JOIN tpcds.tiny.date_dim d1 ON ("cs_sold_date_sk" = "d1"."d_date_sk"))
INNER JOIN tpcds.tiny.date_dim d2 ON ("inv_date_sk" = "d2"."d_date_sk"))
INNER JOIN tpcds.tiny.date_dim d3 ON ("cs_ship_date_sk" = "d3"."d_date_sk"))
LEFT JOIN tpcds.tiny.promotion ON ("cs_promo_sk" = "p_promo_sk"))
LEFT JOIN tpcds.tiny.catalog_returns ON ("cr_item_sk" = "cs_item_sk")
  AND ("cr_order_number" = "cs_order_number"))
WHERE ("d1"."d_week_seq" = "d2"."d_week_seq")
  AND ("inv_quantity_on_hand" < "cs_quantity")
  AND ("d3"."d_date" > ("d1"."d_date" + INTERVAL '5' DAY))
  AND ("hd_buy_potential" = '>10000')
  AND ("d1"."d_year" = 1999)
  AND ("cd_marital_status" = 'D')
GROUP BY "i_item_desc", "w_warehouse_name", "d1"."d_week_seq"
ORDER BY "total_cnt" DESC, "i_item_desc" ASC, "w_warehouse_name" ASC, "d1"."d_week_seq" ASC
LIMIT 100
```

Results: completed in 2 sec

+++++

[('Activities used to get firms. Positive resources would need too across a posts. Bad issues used to sit closely. Slightly true boundaries follow all model courses. Obvious methods attract little o', 'Conventional childr', 5214, 0, 1, 1), ('Agencies shall not ignore detailed costs. About small others cann', 'Conventional childr', 5201, 0, 1, 1), ('Also poor relations take equal, metropolitan courses. Peculiar, popular authorities lose', 'Conventional childr', 5212, 0, 1, 1), ('Children may close necessary dates. Short opportunities improve. Han', 'Conventional childr', 5199, 0, 1, 1),

('English, public guards enter for a friends. Others must accept physically in a bodies. Sons may get by the years. Wide, possible versions examine at least different, econ', 'Conventional childr', 5206, 0, 1, 1)]

SQL name: ./benchmark/tpcds/q73.sql...

=====

```
SELECT
  "c_last_name"
, "c_first_name"
, "c_salutation"
, "c_preferred_cust_flag"
, "ss_ticket_number"
, "cnt"
FROM
  (
    SELECT
      "ss_ticket_number"
    , "ss_customer_sk"
    , "count"(*) "cnt"
    FROM
      tpcds.tiny.store_sales
    , tpcds.tiny.date_dim
    , tpcds.tiny.store
    , tpcds.tiny.household_demographics
    WHERE ("store_sales"."ss_sold_date_sk" = "date_dim"."d_date_sk")
      AND ("store_sales"."ss_store_sk" = "store"."s_store_sk")
      AND ("store_sales"."ss_hdemo_sk" = "household_demographics"."hd_demo_sk")
      AND ("date_dim"."d_dom" BETWEEN 1 AND 2)
      AND (("household_demographics"."hd_buy_potential" = '>10000')
        OR ("household_demographics"."hd_buy_potential" = 'Unknown'))
      AND ("household_demographics"."hd_vehicle_count" > 0)
      AND ((CASE WHEN ("household_demographics"."hd_vehicle_count" > 0) THEN (CAST("household_demographics"."hd_dep_count" AS DECIMAL(7,2)) / "household_demographics"."hd_vehicle_count") ELSE null END) > 1)
      AND ("date_dim"."d_year" IN (1999 , (1999 + 1) , (1999 + 2)))
      AND ("store"."s_county" IN ('Williamson County' , 'Franklin Parish' , 'Bronx County' , 'Orange County'))
    GROUP BY "ss_ticket_number", "ss_customer_sk"
  ) dj
, tpcds.tiny.customer
WHERE ("ss_customer_sk" = "c_customer_sk")
  AND ("cnt" BETWEEN 1 AND 5)
```

```
ORDER BY "cnt" DESC, "c_last_name" ASC
```

Results: completed in 2 sec

+++++

```
[('Hermann', 'Rebecca', 'Mrs.', 'N', 1541, 5)]
```

SQL name: ./benchmark/tpcds/q74.sql...

=====

WITH

year_total AS (

SELECT

"c_customer_id" "customer_id"

, "c_first_name" "customer_first_name"

, "c_last_name" "customer_last_name"

, "d_year" "YEAR"

, "sum"("ss_net_paid") "year_total"

, 's' "sale_type"

FROM

tpcds.tiny.customer

, tpcds.tiny.store_sales

, tpcds.tiny.date_dim

WHERE ("c_customer_sk" = "ss_customer_sk")

AND ("ss_sold_date_sk" = "d_date_sk")

AND ("d_year" IN (2001, (2001 + 1)))

GROUP BY "c_customer_id", "c_first_name", "c_last_name", "d_year"

UNION ALL SELECT

"c_customer_id" "customer_id"

, "c_first_name" "customer_first_name"

, "c_last_name" "customer_last_name"

, "d_year" "YEAR"

, "sum"("ws_net_paid") "year_total"

, 'w' "sale_type"

FROM

tpcds.tiny.customer

, tpcds.tiny.web_sales

, tpcds.tiny.date_dim

WHERE ("c_customer_sk" = "ws_bill_customer_sk")

AND ("ws_sold_date_sk" = "d_date_sk")

AND ("d_year" IN (2001, (2001 + 1)))

GROUP BY "c_customer_id", "c_first_name", "c_last_name", "d_year"

```

)
SELECT
  "t_s_secyear"."customer_id"
, "t_s_secyear"."customer_first_name"
, "t_s_secyear"."customer_last_name"
FROM
  year_total t_s_firstyear
, year_total t_s_secyear
, year_total t_w_firstyear
, year_total t_w_secyear
WHERE ("t_s_secyear"."customer_id" = "t_s_firstyear"."customer_id")
  AND ("t_s_firstyear"."customer_id" = "t_w_secyear"."customer_id")
  AND ("t_s_firstyear"."customer_id" = "t_w_firstyear"."customer_id")
  AND ("t_s_firstyear"."sale_type" = 's')
  AND ("t_w_firstyear"."sale_type" = 'w')
  AND ("t_s_secyear"."sale_type" = 's')
  AND ("t_w_secyear"."sale_type" = 'w')
  AND ("t_s_firstyear"."year" = 2001)
  AND ("t_s_secyear"."year" = (2001 + 1))
  AND ("t_w_firstyear"."year" = 2001)
  AND ("t_w_secyear"."year" = (2001 + 1))
  AND ("t_s_firstyear"."year_total" > 0)
  AND ("t_w_firstyear"."year_total" > 0)
  AND ((CASE WHEN ("t_w_firstyear"."year_total" > 0) THEN ("t_w_secyear"."year_total" / "t_w_first
year"."year_total") ELSE null END) > (CASE WHEN ("t_s_firstyear"."year_total" > 0) THEN ("t_s_secye
ar"."year_total" / "t_s_firstyear"."year_total") ELSE null END))
ORDER BY 1 ASC, 1 ASC, 1 ASC
LIMIT 100

```

Results: completed in 2 sec

```

+++++
[('AAAAAAAABMDAAAAA', 'Jose', 'Guzman'), ('AAAAAAAADOCAAAA
A', 'Joy', 'Baker'), ('AAAAAAAAFBDAAAAA', 'Tara
', 'Rodgers'), ('AAAAAAAFLAAAAA', 'Joseph', 'Riley
'), ('AAAAAAAFNCAAAAA', 'Jennifer', 'Fitzpatrick')]

```

SQL name: ./benchmark/tpcds/q75.sql...

```

=====
WITH

```



```

all_sales AS (
  SELECT
    "d_year"
    , "i_brand_id"
    , "i_class_id"
    , "i_category_id"
    , "i_manufact_id"
    , "sum"("sales_cnt") "sales_cnt"
    , "sum"("sales_amt") "sales_amt"
  FROM
    (
      SELECT
        "d_year"
        , "i_brand_id"
        , "i_class_id"
        , "i_category_id"
        , "i_manufact_id"
        , ("cs_quantity" - COALESCE("cr_return_quantity", 0)) "sales_cnt"
        , ("cs_ext_sales_price" - COALESCE("cr_return_amount", DECIMAL '0.0')) "sales_amt"
      FROM
        (((tpcds.tiny.catalog_sales
        INNER JOIN tpcds.tiny.item ON ("i_item_sk" = "cs_item_sk"))
        INNER JOIN tpcds.tiny.date_dim ON ("d_date_sk" = "cs_sold_date_sk"))
        LEFT JOIN tpcds.tiny.catalog_returns ON ("cs_order_number" = "cr_order_number")
        AND ("cs_item_sk" = "cr_item_sk"))
      WHERE ("i_category" = 'Books')
    UNION
      SELECT
        "d_year"
        , "i_brand_id"
        , "i_class_id"
        , "i_category_id"
        , "i_manufact_id"
        , ("ss_quantity" - COALESCE("sr_return_quantity", 0)) "sales_cnt"
        , ("ss_ext_sales_price" - COALESCE("sr_return_amt", DECIMAL '0.0')) "sales_amt"
      FROM
        (((tpcds.tiny.store_sales
        INNER JOIN tpcds.tiny.item ON ("i_item_sk" = "ss_item_sk"))
        INNER JOIN tpcds.tiny.date_dim ON ("d_date_sk" = "ss_sold_date_sk"))
        LEFT JOIN tpcds.tiny.store_returns ON ("ss_ticket_number" = "sr_ticket_number")
        AND ("ss_item_sk" = "sr_item_sk"))
      WHERE ("i_category" = 'Books')
    UNION
      SELECT
        "d_year"

```

```

        , "i_brand_id"
        , "i_class_id"
        , "i_category_id"
        , "i_manufact_id"
        , ("ws_quantity" - COALESCE("wr_return_quantity", 0)) "sales_cnt"
        , ("ws_ext_sales_price" - COALESCE("wr_return_amt", DECIMAL '0.0')) "sales_amt"
FROM
    ((tpcds.tiny.web_sales
    INNER JOIN tpcds.tiny.item ON ("i_item_sk" = "ws_item_sk"))
    INNER JOIN tpcds.tiny.date_dim ON ("d_date_sk" = "ws_sold_date_sk"))
    LEFT JOIN tpcds.tiny.web_returns ON ("ws_order_number" = "wr_order_number")
        AND ("ws_item_sk" = "wr_item_sk"))
    WHERE ("i_category" = 'Books')
) sales_detail
GROUP BY "d_year", "i_brand_id", "i_class_id", "i_category_id", "i_manufact_id"
)
SELECT
    "prev_yr"."d_year" "prev_year"
    , "curr_yr"."d_year" "year"
    , "curr_yr"."i_brand_id"
    , "curr_yr"."i_class_id"
    , "curr_yr"."i_category_id"
    , "curr_yr"."i_manufact_id"
    , "prev_yr"."sales_cnt" "prev_yr_cnt"
    , "curr_yr"."sales_cnt" "curr_yr_cnt"
    , ("curr_yr"."sales_cnt" - "prev_yr"."sales_cnt") "sales_cnt_diff"
    , ("curr_yr"."sales_amt" - "prev_yr"."sales_amt") "sales_amt_diff"
FROM
    all_sales curr_yr
    , all_sales prev_yr
WHERE ("curr_yr"."i_brand_id" = "prev_yr"."i_brand_id")
    AND ("curr_yr"."i_class_id" = "prev_yr"."i_class_id")
    AND ("curr_yr"."i_category_id" = "prev_yr"."i_category_id")
    AND ("curr_yr"."i_manufact_id" = "prev_yr"."i_manufact_id")
    AND ("curr_yr"."d_year" = 2002)
    AND ("prev_yr"."d_year" = (2002 - 1))
    AND ((CAST("curr_yr"."sales_cnt" AS DECIMAL(17,2)) / CAST("prev_yr"."sales_cnt" AS DECIMAL(17,
2))) < DECIMAL '0.9')
ORDER BY "sales_cnt_diff" ASC, "sales_amt_diff" ASC
LIMIT 100

```

Results: completed in 2 sec

+++++

```
[(2001, 2002, 9008002, 8, 9, 12, 2788, 1560, -1228, '-91938.97'), (2001, 2002, 4001001, 15, 9, 42,
2998, 1873, -1125, '-53106.14'), (2001, 2002, 9015002, 15, 9, 275, 2827, 1715, -1112, '-68057.69'),
(2001, 2002, 9012008, 12, 9, 474, 3054, 2018, -1036, '-41320.66'), (2001, 2002, 9010008, 10, 9, 30
1, 2235, 1408, -827, '-17432.59')]
```

SQL name: ./benchmark/tpcds/q76.sql...

=====

```
SELECT
  "channel"
, "col_name"
, "d_year"
, "d_qoy"
, "i_category"
, "count(*) "sales_cnt"
, "sum("ext_sales_price") "sales_amt"
FROM
(
  SELECT
    'tpcds.tiny.store' "channel"
  , 'ss_store_sk' "col_name"
  , "d_year"
  , "d_qoy"
  , "i_category"
  , "ss_ext_sales_price" "ext_sales_price"
  FROM
    tpcds.tiny.store_sales
  , tpcds.tiny.item
  , tpcds.tiny.date_dim
  WHERE ("ss_store_sk" IS NULL)
    AND ("ss_sold_date_sk" = "d_date_sk")
    AND ("ss_item_sk" = "i_item_sk")
  UNION ALL
  SELECT
    'web' "channel"
  , 'ws_ship_customer_sk' "col_name"
  , "d_year"
  , "d_qoy"
  , "i_category"
  , "ws_ext_sales_price" "ext_sales_price"
  FROM
    tpcds.tiny.web_sales
```

```

    , tpcds.tiny.item
    , tpcds.tiny.date_dim
WHERE ("ws_ship_customer_sk" IS NULL)
    AND ("ws_sold_date_sk" = "d_date_sk")
    AND ("ws_item_sk" = "i_item_sk")
UNION ALL SELECT
    'catalog' "channel"
    , 'cs_ship_addr_sk' "col_name"
    , "d_year"
    , "d_qoy"
    , "i_category"
    , "cs_ext_sales_price" "ext_sales_price"
FROM
    tpcds.tiny.catalog_sales
    , tpcds.tiny.item
    , tpcds.tiny.date_dim
WHERE ("cs_ship_addr_sk" IS NULL)
    AND ("cs_sold_date_sk" = "d_date_sk")
    AND ("cs_item_sk" = "i_item_sk")
) foo
GROUP BY "channel", "col_name", "d_year", "d_qoy", "i_category"
ORDER BY "channel" ASC, "col_name" ASC, "d_year" ASC, "d_qoy" ASC, "i_category" ASC
LIMIT 100

```

Results: completed in 2 sec

```

+++++
[('catalog', 'cs_ship_addr_sk', 1998, 1, 'Books', 1, 411.07'), ('catalog', 'cs_ship_addr_sk', 1998, 1, 'Children', 3, '5081.44'), ('catalog', 'cs_ship_addr_sk', 1998, 1, 'Electronics', 2, '2289.60'), ('catalog', 'cs_ship_addr_sk', 1998, 1, 'Home', 3, '20528.20'), ('catalog', 'cs_ship_addr_sk', 1998, 1, 'Men', 1, None)]

```

SQL name: ./benchmark/tpcds/q77.sql...

=====

```

WITH
    ss AS (
        SELECT
            "s_store_sk"
            , "sum"("ss_ext_sales_price") "sales"

```

```

    , "sum"("ss_net_profit") "profit"
  FROM
    tpcds.tiny.store_sales
  , tpcds.tiny.date_dim
  , tpcds.tiny.store
  WHERE ("ss_sold_date_sk" = "d_date_sk")
    AND ("d_date" BETWEEN CAST('2000-08-23' AS DATE) AND (CAST('2000-08-23' AS DATE) + INTERVAL
'30' DAY))
    AND ("ss_store_sk" = "s_store_sk")
  GROUP BY "s_store_sk"
)
, sr AS (
  SELECT
    "s_store_sk"
  , "sum"("sr_return_amt") "returns"
  , "sum"("sr_net_loss") "profit_loss"
  FROM
    tpcds.tiny.store_returns
  , tpcds.tiny.date_dim
  , tpcds.tiny.store
  WHERE ("sr_returned_date_sk" = "d_date_sk")
    AND ("d_date" BETWEEN CAST('2000-08-23' AS DATE) AND (CAST('2000-08-23' AS DATE) + INTERVAL
'30' DAY))
    AND ("sr_store_sk" = "s_store_sk")
  GROUP BY "s_store_sk"
)
, cs AS (
  SELECT
    "cs_call_center_sk"
  , "sum"("cs_ext_sales_price") "sales"
  , "sum"("cs_net_profit") "profit"
  FROM
    tpcds.tiny.catalog_sales
  , tpcds.tiny.date_dim
  WHERE ("cs_sold_date_sk" = "d_date_sk")
    AND ("d_date" BETWEEN CAST('2000-08-23' AS DATE) AND (CAST('2000-08-23' AS DATE) + INTERVAL
'30' DAY))
  GROUP BY "cs_call_center_sk"
)
, cr AS (
  SELECT
    "cr_call_center_sk"
  , "sum"("cr_return_amount") "returns"

```

```

    , "sum"("cr_net_loss") "profit_loss"
  FROM
    tpcds.tiny.catalog_returns
  , tpcds.tiny.date_dim
  WHERE ("cr_returned_date_sk" = "d_date_sk")
    AND ("d_date" BETWEEN CAST('2000-08-23' AS DATE) AND (CAST('2000-08-23' AS DATE) + INTERVAL
'30' DAY))
    GROUP BY "cr_call_center_sk"
)
, ws AS (
  SELECT
    "wp_web_page_sk"
  , "sum"("ws_ext_sales_price") "sales"
  , "sum"("ws_net_profit") "profit"
  FROM
    tpcds.tiny.web_sales
  , tpcds.tiny.date_dim
  , tpcds.tiny.web_page
  WHERE ("ws_sold_date_sk" = "d_date_sk")
    AND ("d_date" BETWEEN CAST('2000-08-23' AS DATE) AND (CAST('2000-08-23' AS DATE) + INTERVAL
'30' DAY))
    AND ("ws_web_page_sk" = "wp_web_page_sk")
    GROUP BY "wp_web_page_sk"
)
, wr AS (
  SELECT
    "wp_web_page_sk"
  , "sum"("wr_return_amt") "returns"
  , "sum"("wr_net_loss") "profit_loss"
  FROM
    tpcds.tiny.web_returns
  , tpcds.tiny.date_dim
  , tpcds.tiny.web_page
  WHERE ("wr_returned_date_sk" = "d_date_sk")
    AND ("d_date" BETWEEN CAST('2000-08-23' AS DATE) AND (CAST('2000-08-23' AS DATE) + INTERVAL
'30' DAY))
    AND ("wr_web_page_sk" = "wp_web_page_sk")
    GROUP BY "wp_web_page_sk"
)
SELECT
  "channel"
, "id"
, "sum"("sales") "sales"

```

```

, "sum"("returns") "returns"
, "sum"("profit") "profit"
FROM
(
  SELECT
    'tpcds.tiny.store channel' "channel"
    , "ss"."s_store_sk" "id"
    , "sales"
    , COALESCE("returns", 0) "returns"
    , ("profit" - COALESCE("profit_loss", 0)) "profit"
  FROM
    (ss
    LEFT JOIN sr ON ("ss"."s_store_sk" = "sr"."s_store_sk"))
  UNION ALL
    SELECT
    'catalog channel' "channel"
    , "cs_call_center_sk" "id"
    , "sales"
    , "returns"
    , ("profit" - "profit_loss") "profit"
  FROM
    cs
    , cr
  UNION ALL
    SELECT
    'web channel' "channel"
    , "ws"."wp_web_page_sk" "id"
    , "sales"
    , COALESCE("returns", 0) "returns"
    , ("profit" - COALESCE("profit_loss", 0)) "profit"
  FROM
    (ws
    LEFT JOIN wr ON ("ws"."wp_web_page_sk" = "wr"."wp_web_page_sk"))
) x
GROUP BY ROLLUP (channel, id)
ORDER BY "channel" ASC, "id" ASC, "sales" ASC
LIMIT 100

```

Results: completed in 2 sec

+++++

```

[('catalog channel', 1, '8309735.67', '93651.44', '-702794.60'), ('catalog channel', 2, '8506405.2
9', '93651.44', '-675315.32'), ('catalog channel', None, '22821.90', '93651.44', '-73863.53'), ('ca

```

```
atalog channel', None, '16838962.86', '280954.32', '-1451973.45'), ('tpcds.tiny.store channel', 1, '2878513.36', '39454.33', '-1189038.66')]
```

SQL name: ./benchmark/tpcds/q78.sql...

=====

WITH

```
  ws AS (
    SELECT
      "d_year" "ws_sold_year"
    , "ws_item_sk"
    , "ws_bill_customer_sk" "ws_customer_sk"
    , "sum"("ws_quantity") "ws_qty"
    , "sum"("ws_wholesale_cost") "ws_wc"
    , "sum"("ws_sales_price") "ws_sp"
    FROM
      ((tpcds.tiny.web_sales
    LEFT JOIN tpcds.tiny.web_returns ON ("wr_order_number" = "ws_order_number")
      AND ("ws_item_sk" = "wr_item_sk"))
    INNER JOIN tpcds.tiny.date_dim ON ("ws_sold_date_sk" = "d_date_sk"))
    WHERE ("wr_order_number" IS NULL)
    GROUP BY "d_year", "ws_item_sk", "ws_bill_customer_sk"
  )
, cs AS (
    SELECT
      "d_year" "cs_sold_year"
    , "cs_item_sk"
    , "cs_bill_customer_sk" "cs_customer_sk"
    , "sum"("cs_quantity") "cs_qty"
    , "sum"("cs_wholesale_cost") "cs_wc"
    , "sum"("cs_sales_price") "cs_sp"
    FROM
      ((tpcds.tiny.catalog_sales
    LEFT JOIN tpcds.tiny.catalog_returns ON ("cr_order_number" = "cs_order_number")
      AND ("cs_item_sk" = "cr_item_sk"))
    INNER JOIN tpcds.tiny.date_dim ON ("cs_sold_date_sk" = "d_date_sk"))
    WHERE ("cr_order_number" IS NULL)
    GROUP BY "d_year", "cs_item_sk", "cs_bill_customer_sk"
  )
, ss AS (
    SELECT
      "d_year" "ss_sold_year"
    , "ss_item_sk"
```



```

    , "ss_customer_sk"
    , "sum"("ss_quantity") "ss_qty"
    , "sum"("ss_wholesale_cost") "ss_wc"
    , "sum"("ss_sales_price") "ss_sp"
FROM
    ((tpcds.tiny.store_sales
LEFT JOIN tpcds.tiny.store_returns ON ("sr_ticket_number" = "ss_ticket_number")
    AND ("ss_item_sk" = "sr_item_sk"))
INNER JOIN tpcds.tiny.date_dim ON ("ss_sold_date_sk" = "d_date_sk"))
WHERE ("sr_ticket_number" IS NULL)
GROUP BY "d_year", "ss_item_sk", "ss_customer_sk"
)
SELECT
    "ss_sold_year"
    , "ss_item_sk"
    , "ss_customer_sk"
    , "round"((CAST("ss_qty" AS DECIMAL(10,2)) / COALESCE(("ws_qty" + "cs_qty"), 1)), 2) "ratio"
    , "ss_qty" "store_qty"
    , "ss_wc" "store_wholesale_cost"
    , "ss_sp" "store_sales_price"
    , (COALESCE("ws_qty", 0) + COALESCE("cs_qty", 0)) "other_chan_qty"
    , (COALESCE("ws_wc", 0) + COALESCE("cs_wc", 0)) "other_chan_wholesale_cost"
    , (COALESCE("ws_sp", 0) + COALESCE("cs_sp", 0)) "other_chan_sales_price"
FROM
    ((ss
LEFT JOIN ws ON ("ws_sold_year" = "ss_sold_year")
    AND ("ws_item_sk" = "ss_item_sk")
    AND ("ws_customer_sk" = "ss_customer_sk"))
LEFT JOIN cs ON ("cs_sold_year" = "ss_sold_year")
    AND ("cs_item_sk" = "ss_item_sk")
    AND ("cs_customer_sk" = "ss_customer_sk"))
WHERE (COALESCE("ws_qty", 0) > 0)
    AND (COALESCE("cs_qty", 0) > 0)
    AND ("ss_sold_year" = 2000)
ORDER BY "ss_sold_year" ASC, "ss_item_sk" ASC, "ss_customer_sk" ASC, "ss_qty" DESC, "ss_wc" DESC,
"ss_sp" DESC, "other_chan_qty" ASC, "other_chan_wholesale_cost" ASC, "other_chan_sales_price" ASC,
"round"((CAST("ss_qty" AS DECIMAL(10,2)) / COALESCE(("ws_qty" + "cs_qty"), 1)), 2) ASC
LIMIT 100

```

Results: completed in 2 sec

+++++

```
[(2000, 55, 70, '0.46', 30, '4.94', '4.34', 65, '90.60', '11.70'), (2000, 55, 70, '0.39', 30, '4.94', '4.34', 77, '74.13', '25.89'), (2000, 55, 70, '0.35', 30, '4.94', '4.34', 86, '85.73', '103.72'), (2000, 55, 70, '0.24', 30, '4.94', '4.34', 123, '114.52', '112.55'), (2000, 127, 200, '0.56', 27, '55.62', '77.78', 48, '84.72', '23.08')]
```

SQL name: ./benchmark/tpcds/q79.sql...

=====

```
SELECT
  "c_last_name"
, "c_first_name"
, "substr"("s_city", 1, 30)
, "ss_ticket_number"
, "amt"
, "profit"
FROM
  (
    SELECT
      "ss_ticket_number"
    , "ss_customer_sk"
    , "store"."s_city"
    , "sum"("ss_coupon_amt") "amt"
    , "sum"("ss_net_profit") "profit"
    FROM
      tpcds.tiny.store_sales
    , tpcds.tiny.date_dim
    , tpcds.tiny.store
    , tpcds.tiny.household_demographics
    WHERE ("store_sales"."ss_sold_date_sk" = "date_dim"."d_date_sk")
      AND ("store_sales"."ss_store_sk" = "store"."s_store_sk")
      AND ("store_sales"."ss_hdemo_sk" = "household_demographics"."hd_demo_sk")
      AND (("household_demographics"."hd_dep_count" = 6)
        OR ("household_demographics"."hd_vehicle_count" > 2))
      AND ("date_dim"."d_dow" = 1)
      AND ("date_dim"."d_year" IN (1999 , (1999 + 1) , (1999 + 2)))
      AND ("store"."s_number_employees" BETWEEN 200 AND 295)
    GROUP BY "ss_ticket_number", "ss_customer_sk", "ss_addr_sk", "store"."s_city"
  ) ms
, tpcds.tiny.customer
WHERE ("ss_customer_sk" = "c_customer_sk")
ORDER BY "c_last_name" ASC, "c_first_name" ASC, "substr"("s_city", 1, 30) ASC, "profit" ASC
LIMIT 100
```

Results: completed in 2 sec

+++++

('Adams	,	'Chris	,	'Midway',	8820,	'1235.35',	'-2353.80'),
('Adams	,	'Matilde	,	'Midway',	1947,	'2358.31',	'-8518.66'),
('Akers	,	'Richard	,	'Midway',	6952,	'3354.30',	'-5627.48'),
('Albert	,	'Howard	,	'Midway',	7342,	'165.30',	'-1971.74'),
('Albert	,	'John	,	'Midway',	9939,	'335.04',	'-15360.34']]

SQL name: ./benchmark/tpcds/q80.sql...

=====

WITH

```
    ssr AS (
      SELECT
        "s_store_id" "store_id"
      , "sum"("ss_ext_sales_price") "sales"
      , "sum"(COALESCE("sr_return_amt", 0)) "returns"
      , "sum"(("ss_net_profit" - COALESCE("sr_net_loss", 0))) "profit"
      FROM
        (tpcds.tiny.store_sales
        LEFT JOIN tpcds.tiny.store_returns ON ("ss_item_sk" = "sr_item_sk")
          AND ("ss_ticket_number" = "sr_ticket_number"))
      , tpcds.tiny.date_dim
      , tpcds.tiny.store
      , tpcds.tiny.item
      , tpcds.tiny.promotion
      WHERE ("ss_sold_date_sk" = "d_date_sk")
        AND (CAST("d_date" AS DATE) BETWEEN CAST('2000-08-23' AS DATE) AND (CAST('2000-08-23' AS DATE) + INTERVAL '30' DAY))
        AND ("ss_store_sk" = "s_store_sk")
        AND ("ss_item_sk" = "i_item_sk")
        AND ("i_current_price" > 50)
        AND ("ss_promo_sk" = "p_promo_sk")
        AND ("p_channel_tv" = 'N')
      GROUP BY "s_store_id"
    )
  , csr AS (
    SELECT
      "cp_catalog_page_id" "catalog_page_id"
    , "sum"("cs_ext_sales_price") "sales"
    , "sum"(COALESCE("cr_return_amount", 0)) "returns"
```

```

, "sum"(("cs_net_profit" - COALESCE("cr_net_loss", 0))) "profit"
FROM
  (tpcds.tiny.catalog_sales
  LEFT JOIN tpcds.tiny.catalog_returns ON ("cs_item_sk" = "cr_item_sk")
    AND ("cs_order_number" = "cr_order_number"))
, tpcds.tiny.date_dim
, tpcds.tiny.catalog_page
, tpcds.tiny.item
, tpcds.tiny.promotion
WHERE ("cs_sold_date_sk" = "d_date_sk")
  AND (CAST("d_date" AS DATE) BETWEEN CAST('2000-08-23' AS DATE) AND (CAST('2000-08-23' AS DAT
E) + INTERVAL '30' DAY))
  AND ("cs_catalog_page_sk" = "cp_catalog_page_sk")
  AND ("cs_item_sk" = "i_item_sk")
  AND ("i_current_price" > 50)
  AND ("cs_promo_sk" = "p_promo_sk")
  AND ("p_channel_tv" = 'N')
GROUP BY "cp_catalog_page_id"
)
, wsr AS (
  SELECT
    "web_site_id"
  , "sum"("ws_ext_sales_price") "sales"
  , "sum"(COALESCE("wr_return_amt", 0)) "returns"
  , "sum"(("ws_net_profit" - COALESCE("wr_net_loss", 0))) "profit"
FROM
  (tpcds.tiny.web_sales
  LEFT JOIN tpcds.tiny.web_returns ON ("ws_item_sk" = "wr_item_sk")
    AND ("ws_order_number" = "wr_order_number"))
, tpcds.tiny.date_dim
, tpcds.tiny.web_site
, tpcds.tiny.item
, tpcds.tiny.promotion
WHERE ("ws_sold_date_sk" = "d_date_sk")
  AND (CAST("d_date" AS DATE) BETWEEN CAST('2000-08-23' AS DATE) AND (CAST('2000-08-23' AS DAT
E) + INTERVAL '30' DAY))
  AND ("ws_web_site_sk" = "web_site_sk")
  AND ("ws_item_sk" = "i_item_sk")
  AND ("i_current_price" > 50)
  AND ("ws_promo_sk" = "p_promo_sk")
  AND ("p_channel_tv" = 'N')
GROUP BY "web_site_id"
)

```

```

SELECT
  "channel"
, "id"
, "sum"("sales") "sales"
, "sum"("returns") "returns"
, "sum"("profit") "profit"
FROM
  (
    SELECT
      'tpcds.tiny.store channel' "channel"
    , "concat"('store', "store_id") "id"
    , "sales"
    , "returns"
    , "profit"
    FROM
      ssr
    UNION ALL
      SELECT
        'catalog channel' "channel"
      , "concat"('catalog_page', "catalog_page_id") "id"
      , "sales"
      , "returns"
      , "profit"
      FROM
        csr
    UNION ALL
      SELECT
        'web channel' "channel"
      , "concat"('web_site', "web_site_id") "id"
      , "sales"
      , "returns"
      , "profit"
      FROM
        wsr
  ) x
GROUP BY ROLLUP (channel, id)
ORDER BY "channel" ASC, "id" ASC
LIMIT 100

```

Results: completed in 2 sec

+++++

[('catalog channel', 'catalog_pageAAAAAAAAABABAAAA', '0.00', '0.00', '-147.11'), ('catalog channe

```
l', 'catalog_pageAAAAAAAAAEABAAAA', '3697.98', '0.00', '1652.64'), ('catalog channel', 'catalog_pag
eAAAAAAAAAKCBAAAA', '850.41', '0.00', '-7159.68'), ('catalog channel', 'catalog_pageAAAAAAAAALCBAAA
A', '335.04', '0.00', '-256.33'), ('catalog channel', 'catalog_pageAAAAAAAAALPAAAAA', '0.00', '0.0
0', '-1445.22')]
```

SQL name: ./benchmark/tpcds/q81.sql...

=====

WITH

```
customer_total_return AS (
  SELECT
    "cr_returning_customer_sk" "ctr_customer_sk"
  , "ca_state" "ctr_state"
  , "sum"("cr_return_amt_inc_tax") "ctr_total_return"
  FROM
    tpcds.tiny.catalog_returns
  , tpcds.tiny.date_dim
  , tpcds.tiny.customer_address
  WHERE ("cr_returned_date_sk" = "d_date_sk")
    AND ("d_year" = 2000)
    AND ("cr_returning_addr_sk" = "ca_address_sk")
  GROUP BY "cr_returning_customer_sk", "ca_state"
```

)

SELECT

```
"c_customer_id"
, "c_salutation"
, "c_first_name"
, "c_last_name"
, "ca_street_number"
, "ca_street_name"
, "ca_street_type"
, "ca_suite_number"
, "ca_city"
, "ca_county"
, "ca_state"
, "ca_zip"
, "ca_country"
, "ca_gmt_offset"
, "ca_location_type"
, "ctr_total_return"
```

FROM

```
customer_total_return ctrl
, tpcds.tiny.customer_address
```

```

, tpcds.tiny.customer
WHERE ("ctrl"."ctr_total_return" > (
    SELECT ("avg"("ctr_total_return") * DECIMAL '1.2')
    FROM
        customer_total_return ctr2
    WHERE ("ctrl"."ctr_state" = "ctr2"."ctr_state")
))
AND ("ca_address_sk" = "c_current_addr_sk")
AND ("ca_state" = 'GA')
AND ("ctrl"."ctr_customer_sk" = "c_customer_sk")
ORDER BY "c_customer_id" ASC, "c_salutation" ASC, "c_first_name" ASC, "c_last_name" ASC, "ca_street
_number" ASC, "ca_street_name" ASC, "ca_street_type" ASC, "ca_suite_number" ASC, "ca_city" ASC, "ca
_county" ASC, "ca_state" ASC, "ca_zip" ASC, "ca_country" ASC, "ca_gmt_offset" ASC, "ca_location_typ
e" ASC, "ctr_total_return" ASC
LIMIT 100

```

Results: completed in 1 sec

```

+++++
[('AAAAAAAABKCAAAAA', 'Dr.          ', 'Terrence          ', 'Albright          ', '419
', 'View Miller', 'Wy          ', 'Suite 360 ', 'Pleasant Grove', 'Cobb County', 'GA', '34136
', 'United States', '-5.00', 'single family          ', '5079.60'), ('AAAAAAAACKBAAAAA', 'Dr.          ',
'Maurice          ', 'Morales          ', '313          ', '2nd Eigh', 'Avenue
', 'Suite 40 ', 'Marion', 'Glascock County', 'GA', '30399          ', 'United States', '-5.00', 'condo
', '3038.84'), ('AAAAAAAACNAAAAAA', 'Ms.          ', 'Diane          ', 'Blount
', '780          ', '4th ', 'Ave          ', 'Suite T ', 'Spring Hill', 'Worth County', 'GA', '367
87          ', 'United States', '-5.00', 'single family          ', '5614.20'), ('AAAAAAAADADAAAAA', 'Mr.
', 'Charles          ', 'Loveless          ', '24          ', 'Central ', 'Blvd
', 'Suite 490 ', 'Crossroads', 'Brooks County', 'GA', '30534          ', 'United States', '-5.00', 'sing
le family          ', '1429.42'), ('AAAAAAAADGDAAAAA', 'Mr.          ', 'Alberto          ', 'Mccreary
', '379          ', 'Spring Eigh', 'Street          ', 'Suite R ', 'Cedar Grove', 'Wilcox County',
'GA', '30411          ', 'United States', '-5.00', 'single family          ', '544.12')]

```

SQL name: ./benchmark/tpcds/q82.sql...

```

=====
SELECT
    "i_item_id"
, "i_item_desc"
, "i_current_price"
FROM
    tpcds.tiny.item

```

```

, tpcds.tiny.inventory
, tpcds.tiny.date_dim
, tpcds.tiny.store_sales
WHERE ("i_current_price" BETWEEN 62 AND (62 + 30))
    AND ("inv_item_sk" = "i_item_sk")
    AND ("d_date_sk" = "inv_date_sk")
    AND (CAST("d_date" AS DATE) BETWEEN CAST('2000-05-25' AS DATE) AND (CAST('2000-05-25' AS DATE) +
INTERVAL '60' DAY))
    AND ("i_manufact_id" IN (129, 270, 821, 423))
    AND ("inv_quantity_on_hand" BETWEEN 100 AND 500)
    AND ("ss_item_sk" = "i_item_sk")
GROUP BY "i_item_id", "i_item_desc", "i_current_price"
ORDER BY "i_item_id" ASC
LIMIT 100

```

Results: completed in 2 sec

```

+++++
[]

```

SQL name: ./benchmark/tpcds/q83.sql...

=====

WITH

```

sr_items AS (
  SELECT
    "i_item_id" "item_id"
    , "sum"("sr_return_quantity") "sr_item_qty"
  FROM
    tpcds.tiny.store_returns
    , tpcds.tiny.item
    , tpcds.tiny.date_dim
  WHERE ("sr_item_sk" = "i_item_sk")
    AND ("d_date" IN (
    SELECT "d_date"
    FROM
      tpcds.tiny.date_dim
    WHERE ("d_week_seq" IN (
      SELECT "d_week_seq"
      FROM
        tpcds.tiny.date_dim
      WHERE ("d_date" IN (CAST('2000-06-30' AS DATE)

```

```

, CAST('2000-09-27' AS DATE)

```



```

, CAST('2000-11-17' AS DATE)))
    ))
  ))
    AND ("sr_returned_date_sk" = "d_date_sk")
    GROUP BY "i_item_id"
  )
, cr_items AS (
  SELECT
    "i_item_id" "item_id"
    , "sum"("cr_return_quantity") "cr_item_qty"
  FROM
    tpcds.tiny.catalog_returns
    , tpcds.tiny.item
    , tpcds.tiny.date_dim
  WHERE ("cr_item_sk" = "i_item_sk")
    AND ("d_date" IN (
      SELECT "d_date"
      FROM
        tpcds.tiny.date_dim
      WHERE ("d_week_seq" IN (
        SELECT "d_week_seq"
        FROM
          tpcds.tiny.date_dim
          WHERE ("d_date" IN (CAST('2000-06-30' AS DATE)
, CAST('2000-09-27' AS DATE)
, CAST('2000-11-17' AS DATE)))
      ))
    ))
    AND ("cr_returned_date_sk" = "d_date_sk")
    GROUP BY "i_item_id"
  )
, wr_items AS (
  SELECT
    "i_item_id" "item_id"
    , "sum"("wr_return_quantity") "wr_item_qty"
  FROM
    tpcds.tiny.web_returns
    , tpcds.tiny.item
    , tpcds.tiny.date_dim
  WHERE ("wr_item_sk" = "i_item_sk")
    AND ("d_date" IN (
      SELECT "d_date"
      FROM
        tpcds.tiny.date_dim

```

```

        WHERE ("d_week_seq" IN (
            SELECT "d_week_seq"
            FROM
                tpcds.tiny.date_dim
            WHERE ("d_date" IN (CAST('2000-06-30' AS DATE)
                                , CAST('2000-09-27' AS DATE)
                                , CAST('2000-11-17' AS DATE)))
        ))
    ))
    AND ("wr_returned_date_sk" = "d_date_sk")
    GROUP BY "i_item_id"
)
SELECT
    "sr_items"."item_id"
    , "sr_item_qty"
    , CAST((((("sr_item_qty" / ((CAST("sr_item_qty" AS DECIMAL(9,4)) + "cr_item_qty") + "wr_item_qty"))
    / DECIMAL '3.0') * 100) AS DECIMAL(7,2)) "sr_dev"
    , "cr_item_qty"
    , CAST((((("cr_item_qty" / ((CAST("sr_item_qty" AS DECIMAL(9,4)) + "cr_item_qty") + "wr_item_qty"))
    / DECIMAL '3.0') * 100) AS DECIMAL(7,2)) "cr_dev"
    , "wr_item_qty"
    , CAST((((("wr_item_qty" / ((CAST("sr_item_qty" AS DECIMAL(9,4)) + "cr_item_qty") + "wr_item_qty"))
    / DECIMAL '3.0') * 100) AS DECIMAL(7,2)) "wr_dev"
    , (((("sr_item_qty" + "cr_item_qty") + "wr_item_qty") / DECIMAL '3.00') "average"
FROM
    sr_items
    , cr_items
    , wr_items
WHERE ("sr_items"."item_id" = "cr_items"."item_id")
    AND ("sr_items"."item_id" = "wr_items"."item_id")
ORDER BY "sr_items"."item_id" ASC, "sr_item_qty" ASC
LIMIT 100

```

Results: completed in 2 sec

```

+++++
[]

```

SQL name: ./benchmark/tpcds/q84.sql...

```

=====
SELECT
    "c_customer_id" "customer_id"

```

```
, "concat"("concat"("c_last_name", ', '), "c_first_name") "tpcds.tiny.customername"
FROM
  tpcds.tiny.customer
, tpcds.tiny.customer_address
, tpcds.tiny.customer_demographics
, tpcds.tiny.household_demographics
, tpcds.tiny.income_band
, tpcds.tiny.store_returns
WHERE ("ca_city" = 'Edgewood')
  AND ("c_current_addr_sk" = "ca_address_sk")
  AND ("ib_lower_bound" >= 38128)
  AND ("ib_upper_bound" <= (38128 + 50000))
  AND ("ib_income_band_sk" = "hd_income_band_sk")
  AND ("cd_demo_sk" = "c_current_cdemo_sk")
  AND ("hd_demo_sk" = "c_current_hdemo_sk")
  AND ("sr_cdemo_sk" = "cd_demo_sk")
ORDER BY "c_customer_id" ASC
LIMIT 100
```

Results: completed in 1 sec

```
+++++
[]
```

SQL name: ./benchmark/tpcds/q85.sql...

=====

```
SELECT
  "substr"("r_reason_desc", 1, 20)
, "avg"("ws_quantity")
, "avg"("wr_refunded_cash")
, "avg"("wr_fee")
FROM
  tpcds.tiny.web_sales
, tpcds.tiny.web_returns
, tpcds.tiny.web_page
, tpcds.tiny.customer_demographics cd1
, tpcds.tiny.customer_demographics cd2
, tpcds.tiny.customer_address
, tpcds.tiny.date_dim
, tpcds.tiny.reason
WHERE ("ws_web_page_sk" = "wp_web_page_sk")
```

```

AND ("ws_item_sk" = "wr_item_sk")
AND ("ws_order_number" = "wr_order_number")
AND ("ws_sold_date_sk" = "d_date_sk")
AND ("d_year" = 2000)
AND ("cd1"."cd_demo_sk" = "wr_refunded_cdemo_sk")
AND ("cd2"."cd_demo_sk" = "wr_returning_cdemo_sk")
AND ("ca_address_sk" = "wr_refunded_addr_sk")
AND ("r_reason_sk" = "wr_reason_sk")
AND (((("cd1"."cd_marital_status" = 'M')
        AND ("cd1"."cd_marital_status" = "cd2"."cd_marital_status")
        AND ("cd1"."cd_education_status" = 'Advanced Degree')
        AND ("cd1"."cd_education_status" = "cd2"."cd_education_status")
        AND ("ws_sales_price" BETWEEN DECIMAL '100.00' AND DECIMAL '150.00')))
OR (((("cd1"."cd_marital_status" = 'S')
        AND ("cd1"."cd_marital_status" = "cd2"."cd_marital_status")
        AND ("cd1"."cd_education_status" = 'College')
        AND ("cd1"."cd_education_status" = "cd2"."cd_education_status")
        AND ("ws_sales_price" BETWEEN DECIMAL '50.00' AND DECIMAL '100.00')))
OR (((("cd1"."cd_marital_status" = 'W')
        AND ("cd1"."cd_marital_status" = "cd2"."cd_marital_status")
        AND ("cd1"."cd_education_status" = '2 yr Degree')
        AND ("cd1"."cd_education_status" = "cd2"."cd_education_status")
        AND ("ws_sales_price" BETWEEN DECIMAL '150.00' AND DECIMAL '200.00'))))
AND (((("ca_country" = 'United States')
        AND ("ca_state" IN ('IN' , 'OH' , 'NJ'))
        AND ("ws_net_profit" BETWEEN 100 AND 200))
OR (((("ca_country" = 'United States')
        AND ("ca_state" IN ('WI' , 'CT' , 'KY'))
        AND ("ws_net_profit" BETWEEN 150 AND 300))
OR (((("ca_country" = 'United States')
        AND ("ca_state" IN ('LA' , 'IA' , 'AR'))
        AND ("ws_net_profit" BETWEEN 50 AND 250))))
GROUP BY "r_reason_desc"
ORDER BY "substr"("r_reason_desc", 1, 20) ASC, "avg"("ws_quantity") ASC, "avg"("wr_refunded_cash")
ASC, "avg"("wr_fee") ASC
LIMIT 100

```

Traceback (most recent call last):

File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.py", line 955, in fetchone

```

    row = dbapi_cursor.fetchone()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 10
6, in fetchone
    self._fetch_while(lambda: not self._data and self._state != self._STATE_FINISHED)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 46,
in _fetch_while
    self._fetch_more()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 30
8, in _fetch_more
    self._process_response(self._requests_session.get(self._nextUri, **self._requests_kwargs))
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 34
9, in _process_response
    raise DatabaseError(response_json['error'])
pyhive.exc.DatabaseError: {'message': 'Query exceeded per-node user memory limit of 102.40MB [All
located: 102.38MB, Delta: 540.25kB, Top Consumers: {HashBuilderOperator=102.38MB, PartitionedOutpu
tOperator=10.01MB, ScanFilterAndProjectOperator=6.27MB}, Details: [{"taskId":"6.0.0","reservatio
n":"57.28MB","topConsumers":[{"type":"HashBuilderOperator","planNodeId":"179","reservations":["3.
64MB","3.63MB","3.62MB","3.59MB","3.58MB","3.57MB","3.57MB","3.57MB","3.57MB","3.57MB","3.56M
B","3.56MB","3.56MB","3.56MB","3.55MB","3.55MB"],"total":"57.28MB","info":"INNER;PARTITIONE
D;"}]},{taskId":"5.0.0","reservation":"41.07MB","topConsumers":[{"type":"HashBuilderOperator","p
lanNodeId":"171","reservations":["3.29MB","3.28MB","3.28MB","3.24MB","2.69MB","2.54MB","2.29M
B","2.29MB","2.28MB","2.27MB","2.27MB","2.27MB","2.27MB","2.27MB","2.26MB","2.26MB"],"total":"41.
07MB","info":"INNER;PARTITIONED;"}]},{taskId":"13.0.0","reservation":"8.76MB","topConsumers":
[{"type":"PartitionedOutputOperator","planNodeId":"1510","reservations":["1.25MB","1.25MB","1.25M
B","1.25MB"],"total":"5.00MB"}, {"type":"ScanFilterAndProjectOperator","planNodeId":"1510","reserv
ations":["1.25MB","1.25MB","1.25MB","680B"],"total":"3.75MB"}]}}', 'errorCode': 131079, 'errorNa
me': 'EXCEEDED_LOCAL_MEMORY_LIMIT', 'errorType': 'INSUFFICIENT_RESOURCES', 'boolean': False, 'fai
lureInfo': {'type': 'com.facebook.presto.ExceededMemoryLimitException', 'message': 'Query exceede
d per-node user memory limit of 102.40MB [Allocated: 102.38MB, Delta: 540.25kB, Top Consumers: {H
ashBuilderOperator=102.38MB, PartitionedOutputOperator=10.01MB, ScanFilterAndProjectOperator=6.27
MB}, Details: [{"taskId":"6.0.0","reservation":"57.28MB","topConsumers":[{"type":"HashBuilderOper
ator","planNodeId":"179","reservations":["3.64MB","3.63MB","3.62MB","3.59MB","3.58MB","3.57M
B","3.57MB","3.57MB","3.57MB","3.57MB","3.56MB","3.56MB","3.56MB","3.56MB","3.55MB","3.55MB"],"to
tal":"57.28MB","info":"INNER;PARTITIONED;"}]},{taskId":"5.0.0","reservation":"41.07MB","topConsu
mers":[{"type":"HashBuilderOperator","planNodeId":"171","reservations":["3.29MB","3.28MB","3.28M
B","3.24MB","2.69MB","2.54MB","2.29MB","2.29MB","2.28MB","2.27MB","2.27MB","2.27MB","2.27MB","2.2
7MB","2.26MB","2.26MB"],"total":"41.07MB","info":"INNER;PARTITIONED;"}]},{taskId":"13.0.0","rese
rvation":"8.76MB","topConsumers":[{"type":"PartitionedOutputOperator","planNodeId":"1510","reserv
ations":["1.25MB","1.25MB","1.25MB","1.25MB"],"total":"5.00MB"}, {"type":"ScanFilterAndProjectOper
ator","planNodeId":"1510","reservations":["1.25MB","1.25MB","1.25MB","680B"],"total":"3.75M
B"}]}}', 'suppressed': [], 'stack': ['com.facebook.presto.ExceededMemoryLimitException.exceededL
ocalUserMemoryLimit(ExceededMemoryLimitException.java:49)', 'com.facebook.presto.memory.QueryCont
ext.enforceUserMemoryLimit(QueryContext.java:496)', 'com.facebook.presto.memory.QueryContext.upda

```

```

teUserMemory(QueryContext.java:192)', 'com.facebook.presto.memory.QueryContext$QueryMemoryReserva
tionHandler.reserveMemory(QueryContext.java:462)', 'com.facebook.presto.memory.context.RootAggreg
atedMemoryContext.updateBytes(RootAggregatedMemoryContext.java:37)', 'com.facebook.presto.memory.
context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.fac
ebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContex
t.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAg
gregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContex
t.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.SimpleL
ocalMemoryContext.setBytes(SimpleLocalMemoryContext.java:82)', 'com.facebook.presto.operator.Oper
atorContext$InternalLocalMemoryContext.setBytes(OperatorContext.java:672)', 'com.facebook.presto.
operator.HashBuilderOperator.updateIndex(HashBuilderOperator.java:358)', 'com.facebook.presto.ope
rator.HashBuilderOperator.addInput(HashBuilderOperator.java:345)', 'com.facebook.presto.operator.
Driver.processInternal(Driver.java:428)', 'com.facebook.presto.operator.Driver.lambda$processFor
$9(Driver.java:301)', 'com.facebook.presto.operator.Driver.tryWithLock(Driver.java:722)', 'com.fa
cebook.presto.operator.Driver.processFor(Driver.java:294)', 'com.facebook.presto.execution.SqlTas
kExecution$DriverSplitRunner.processFor(SqlTaskExecution.java:1077)', 'com.facebook.presto.execut
ion.executor.PrioritizedSplitRunner.process(PrioritizedSplitRunner.java:162)', 'com.facebook.prest
o.execution.executor.TaskExecutor$TaskRunner.run(TaskExecutor.java:599)', 'com.facebook.prest
o.$gen.Presto_0_263_b9fd4d4____20211010_164639_1.run(Unknown Source)', 'java.base/java.util.concu
rrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1128)', 'java.base/java.util.concurren
t.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:628)', 'java.base/java.lang.Thread.run(Th
read.java:829)']}]

```

The above exception was the direct cause of the following exception:

Traceback (most recent call last):

```

File "/tmp/ipykernel_394536/722970930.py", line 15, in <module>
    for row in rs:
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/result.p
y", line 381, in iterrows
    for row in self._fetchiter_impl():
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.p
y", line 1788, in _fetchiter_impl
    row = fetchone(self, self.cursor)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.p
y", line 960, in fetchone
    self.handle_exception(result, dbapi_cursor, e)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.p
y", line 941, in handle_exception
    result.connection._handle_dbapi_exception(
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py",
line 2023, in _handle_dbapi_exception
    util.raise_(

```

```

File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/util/compat.py",
line 207, in raise_
    raise exception
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/cursor.p
y", line 955, in fetchone
    row = dbapi_cursor.fetchone()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 10
6, in fetchone
    self._fetch_while(lambda: not self._data and self._state != self._STATE_FINISHED)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 46,
in _fetch_while
    self._fetch_more()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 30
8, in _fetch_more
    self._process_response(self._requests_session.get(self._nextUri, **self._requests_kwargs))
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 34
9, in _process_response
    raise DatabaseError(response_json['error'])
sqlalchemy.exc.DatabaseError: (pyhive.exc.DatabaseError) {'message': 'Query exceeded per-node use
r memory limit of 102.40MB [Allocated: 102.38MB, Delta: 540.25kB, Top Consumers: {HashBuilderOper
ator=102.38MB, PartitionedOutputOperator=10.01MB, ScanFilterAndProjectOperator=6.27MB}, Details:
[{"taskId":"6.0.0","reservation":"57.28MB","topConsumers":[{"type":"HashBuilderOperator","planNod
eId":"179","reservations":["3.64MB","3.63MB","3.62MB","3.59MB","3.58MB","3.57MB","3.57MB","3.57M
B","3.57MB","3.57MB","3.56MB","3.56MB","3.56MB","3.56MB","3.55MB","3.55MB"],"total":"57.28MB","in
fo":"INNER;PARTITIONED;"}]},{taskId":"5.0.0","reservation":"41.07MB","topConsumers":[{"type":"Ha
shBuilderOperator","planNodeId":"171","reservations":["3.29MB","3.28MB","3.28MB","3.24MB","2.69M
B","2.54MB","2.29MB","2.29MB","2.28MB","2.27MB","2.27MB","2.27MB","2.27MB","2.27MB","2.26MB","2.2
6MB"],"total":"41.07MB","info":"INNER;PARTITIONED;"}]},{taskId":"13.0.0","reservation":"8.76M
B","topConsumers":[{"type":"PartitionedOutputOperator","planNodeId":"1510","reservations":["1.25M
B","1.25MB","1.25MB","1.25MB"],"total":"5.00MB"}, {"type":"ScanFilterAndProjectOperator","planNode
Id":"1510","reservations":["1.25MB","1.25MB","1.25MB","680B"],"total":"3.75MB"}]}}', 'errorCod
e': 131079, 'errorName': 'EXCEEDED_LOCAL_MEMORY_LIMIT', 'errorType': 'INSUFFICIENT_RESOURCES', 'b
oolean': False, 'failureInfo': {'type': 'com.facebook.presto.ExceededMemoryLimitException', 'mess
age': 'Query exceeded per-node user memory limit of 102.40MB [Allocated: 102.38MB, Delta: 540.25k
B, Top Consumers: {HashBuilderOperator=102.38MB, PartitionedOutputOperator=10.01MB, ScanFilterAnd
ProjectOperator=6.27MB}, Details: [{"taskId":"6.0.0","reservation":"57.28MB","topConsumers":[{"ty
pe":"HashBuilderOperator","planNodeId":"179","reservations":["3.64MB","3.63MB","3.62MB","3.59M
B","3.58MB","3.57MB","3.57MB","3.57MB","3.57MB","3.57MB","3.56MB","3.56MB","3.56MB","3.56MB","3.5
5MB","3.55MB"],"total":"57.28MB","info":"INNER;PARTITIONED;"}]},{taskId":"5.0.0","reservatio
n":"41.07MB","topConsumers":[{"type":"HashBuilderOperator","planNodeId":"171","reservations":["3.
29MB","3.28MB","3.28MB","3.24MB","2.69MB","2.54MB","2.29MB","2.29MB","2.28MB","2.27MB","2.27M
B","2.27MB","2.27MB","2.27MB","2.26MB","2.26MB"],"total":"41.07MB","info":"INNER;PARTITIONE
D;"}]},{taskId":"13.0.0","reservation":"8.76MB","topConsumers":[{"type":"PartitionedOutputOperat

```

```

or", "planNodeId": "1510", "reservations": ["1.25MB", "1.25MB", "1.25MB", "1.25MB"], "total": "5.00MB"},
{"type": "ScanFilterAndProjectOperator", "planNodeId": "1510", "reservations": ["1.25MB", "1.25MB", "1.25MB", "680B"], "total": "3.75MB"}]]]]', 'suppressed': [], 'stack': ['com.facebook.presto.ExceededMemoryLimitException.exceededLocalUserMemoryLimit(ExceededMemoryLimitException.java:49)', 'com.facebook.presto.memory.QueryContext.enforceUserMemoryLimit(QueryContext.java:496)', 'com.facebook.presto.memory.QueryContext.updateUserMemory(QueryContext.java:192)', 'com.facebook.presto.memory.QueryContext$QueryMemoryReservationHandler.reserveMemory(QueryContext.java:462)', 'com.facebook.presto.memory.context.RootAggregatedMemoryContext.updateBytes(RootAggregatedMemoryContext.java:37)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.ChildAggregatedMemoryContext.updateBytes(ChildAggregatedMemoryContext.java:38)', 'com.facebook.presto.memory.context.SimpleLocalMemoryContext.setBytes(SimpleLocalMemoryContext.java:82)', 'com.facebook.presto.operator.OperatorContext$InternalLocalMemoryContext.setBytes(OperatorContext.java:672)', 'com.facebook.presto.operator.HashBuilderOperator.updateIndex(HashBuilderOperator.java:358)', 'com.facebook.presto.operator.HashBuilderOperator.addInput(HashBuilderOperator.java:345)', 'com.facebook.presto.operator.Driver.processInternal(Driver.java:428)', 'com.facebook.presto.operator.Driver.lambda$processFor$9(Driver.java:301)', 'com.facebook.presto.operator.Driver.tryWithLock(Driver.java:722)', 'com.facebook.presto.operator.Driver.processFor(Driver.java:294)', 'com.facebook.presto.execution.SqlTaskExecution$DriverSplitRunner.processFor(SqlTaskExecution.java:1077)', 'com.facebook.presto.execution.executor.PrioritizedSplitRunner.process(PrioritizedSplitRunner.java:162)', 'com.facebook.presto.execution.executor.TaskExecutor$TaskRunner.run(TaskExecutor.java:599)', 'com.facebook.presto.$gen.Presto_0_263_b9fd4d4_20211010_164639_1.run(Unknown Source)', 'java.base/java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1128)', 'java.base/java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:628)', 'java.base/java.lang.Thread.run(Thread.java:829)']]}}
(Background on this error at: https://sqlalche.me/e/14/4xp6) (https://sqlalche.me/e/14/4xp6)

```

SQL name: ./benchmark/tpcds/q86.sql...

=====

```

SELECT
  "sum"("ws_net_paid") "total_sum"
, "i_category"
, "i_class"
, (GROUPING ("i_category") + GROUPING ("i_class")) "lochierarchy"
, "rank"() OVER (PARTITION BY (GROUPING ("i_category") + GROUPING ("i_class")), (CASE WHEN (GROUPING ("i_class") = 0) THEN "i_category" END) ORDER BY "sum"("ws_net_paid") DESC) "rank_within_parent"
FROM
  tpcds.tiny.web_sales

```



```
, tpcds.tiny.date_dim d1
, tpcds.tiny.item
WHERE ("d1"."d_month_seq" BETWEEN 1200 AND (1200 + 11))
      AND ("d1"."d_date_sk" = "ws_sold_date_sk")
      AND ("i_item_sk" = "ws_item_sk")
GROUP BY ROLLUP (i_category, i_class)
ORDER BY "lochierarchy" DESC, (CASE WHEN ("lochierarchy" = 0) THEN "i_category" END) ASC, "rank_w
ithin_parent" ASC
LIMIT 100
```

Results: completed in 1 sec

+++++

```
[('5189585.33', None, None, 2, 1), ('655046.32', 'Men
', None, 1, 1), ('626624.82', 'Women
', None, 1, 2),
('581067.68', 'Books
', None, 1, 3), ('561790.19', 'M
usic
', None, 1, 4)]
```

SQL name: ./benchmark/tpcds/q87.sql...

=====

```
SELECT "count"(*)
FROM
(
(
SELECT DISTINCT
  "c_last_name"
, "c_first_name"
, "d_date"
FROM
  tpcds.tiny.store_sales
, tpcds.tiny.date_dim
, tpcds.tiny.customer
WHERE ("store_sales"."ss_sold_date_sk" = "date_dim"."d_date_sk")
      AND ("store_sales"."ss_customer_sk" = "customer"."c_customer_sk")
      AND ("d_month_seq" BETWEEN 1200 AND (1200 + 11))
) EXCEPT (
SELECT DISTINCT
  "c_last_name"
, "c_first_name"
, "d_date"
```

```

FROM
    tpcds.tiny.catalog_sales
, tpcds.tiny.date_dim
, tpcds.tiny.customer
WHERE ("catalog_sales"."cs_sold_date_sk" = "date_dim"."d_date_sk")
    AND ("catalog_sales"."cs_bill_customer_sk" = "customer"."c_customer_sk")
    AND ("d_month_seq" BETWEEN 1200 AND (1200 + 11))
) EXCEPT (
    SELECT DISTINCT
        "c_last_name"
    , "c_first_name"
    , "d_date"
    FROM
        tpcds.tiny.web_sales
    , tpcds.tiny.date_dim
    , tpcds.tiny.customer
    WHERE ("web_sales"."ws_sold_date_sk" = "date_dim"."d_date_sk")
        AND ("web_sales"."ws_bill_customer_sk" = "customer"."c_customer_sk")
        AND ("d_month_seq" BETWEEN 1200 AND (1200 + 11))
) ) cool_cust

```

Results: completed in 2 sec

```

+++++
[(1994,)]

```

SQL name: ./benchmark/tpcds/q88.sql...

=====

```

SELECT *
FROM
    (
        SELECT "count"(*) "h8_30_to_9"
        FROM
            tpcds.tiny.store_sales
        , tpcds.tiny.household_demographics
        , tpcds.tiny.time_dim
        , tpcds.tiny.store
        WHERE ("ss_sold_time_sk" = "time_dim"."t_time_sk")
            AND ("ss_hdemo_sk" = "household_demographics"."hd_demo_sk")
            AND ("ss_store_sk" = "s_store_sk")
            AND ("time_dim"."t_hour" = 8)
    )

```

```

        AND ("time_dim"."t_minute" >= 30)
        AND (((("household_demographics"."hd_dep_count" = 4)
            AND ("household_demographics"."hd_vehicle_count" <= (4 + 2)))
            OR (((("household_demographics"."hd_dep_count" = 2)
                AND ("household_demographics"."hd_vehicle_count" <= (2 + 2)))
                OR (((("household_demographics"."hd_dep_count" = 0)
                    AND ("household_demographics"."hd_vehicle_count" <= (0 + 2))))
            AND ("store"."s_store_name" = 'ese')
    ) s1
, (
    SELECT "count"(*) "h9_to_9_30"
    FROM
        tpcds.tiny.store_sales
    , tpcds.tiny.household_demographics
    , tpcds.tiny.time_dim
    , tpcds.tiny.store
    WHERE ("ss_sold_time_sk" = "time_dim"."t_time_sk")
        AND ("ss_hdemo_sk" = "household_demographics"."hd_demo_sk")
        AND ("ss_store_sk" = "s_store_sk")
        AND ("time_dim"."t_hour" = 9)
        AND ("time_dim"."t_minute" < 30)
        AND (((("household_demographics"."hd_dep_count" = 4)
            AND ("household_demographics"."hd_vehicle_count" <= (4 + 2)))
            OR (((("household_demographics"."hd_dep_count" = 2)
                AND ("household_demographics"."hd_vehicle_count" <= (2 + 2)))
                OR (((("household_demographics"."hd_dep_count" = 0)
                    AND ("household_demographics"."hd_vehicle_count" <= (0 + 2))))
            AND ("store"."s_store_name" = 'ese')
    ) s2
, (
    SELECT "count"(*) "h9_30_to_10"
    FROM
        tpcds.tiny.store_sales
    , tpcds.tiny.household_demographics
    , tpcds.tiny.time_dim
    , tpcds.tiny.store
    WHERE ("ss_sold_time_sk" = "time_dim"."t_time_sk")
        AND ("ss_hdemo_sk" = "household_demographics"."hd_demo_sk")
        AND ("ss_store_sk" = "s_store_sk")
        AND ("time_dim"."t_hour" = 9)
        AND ("time_dim"."t_minute" >= 30)
        AND (((("household_demographics"."hd_dep_count" = 4)
            AND ("household_demographics"."hd_vehicle_count" <= (4 + 2)))

```

```

        OR (("household_demographics"."hd_dep_count" = 2)
            AND ("household_demographics"."hd_vehicle_count" <= (2 + 2)))
        OR (("household_demographics"."hd_dep_count" = 0)
            AND ("household_demographics"."hd_vehicle_count" <= (0 + 2))))
    AND ("store"."s_store_name" = 'ese')
) s3
, (
    SELECT "count"(*) "h10_to_10_30"
    FROM
        tpcds.tiny.store_sales
    , tpcds.tiny.household_demographics
    , tpcds.tiny.time_dim
    , tpcds.tiny.store
    WHERE ("ss_sold_time_sk" = "time_dim"."t_time_sk")
        AND ("ss_hdemo_sk" = "household_demographics"."hd_demo_sk")
        AND ("ss_store_sk" = "s_store_sk")
        AND ("time_dim"."t_hour" = 10)
        AND ("time_dim"."t_minute" < 30)
        AND (((("household_demographics"."hd_dep_count" = 4)
            AND ("household_demographics"."hd_vehicle_count" <= (4 + 2)))
            OR (("household_demographics"."hd_dep_count" = 2)
                AND ("household_demographics"."hd_vehicle_count" <= (2 + 2)))
            OR (("household_demographics"."hd_dep_count" = 0)
                AND ("household_demographics"."hd_vehicle_count" <= (0 + 2))))
        AND ("store"."s_store_name" = 'ese')
) s4
, (
    SELECT "count"(*) "h10_30_to_11"
    FROM
        tpcds.tiny.store_sales
    , tpcds.tiny.household_demographics
    , tpcds.tiny.time_dim
    , tpcds.tiny.store
    WHERE ("ss_sold_time_sk" = "time_dim"."t_time_sk")
        AND ("ss_hdemo_sk" = "household_demographics"."hd_demo_sk")
        AND ("ss_store_sk" = "s_store_sk")
        AND ("time_dim"."t_hour" = 10)
        AND ("time_dim"."t_minute" >= 30)
        AND (((("household_demographics"."hd_dep_count" = 4)
            AND ("household_demographics"."hd_vehicle_count" <= (4 + 2)))
            OR (("household_demographics"."hd_dep_count" = 2)
                AND ("household_demographics"."hd_vehicle_count" <= (2 + 2)))
            OR (("household_demographics"."hd_dep_count" = 0)
                AND ("household_demographics"."hd_vehicle_count" <= (0 + 2))))

```

```

                AND ("household_demographics"."hd_vehicle_count" <= (0 + 2))))
        AND ("store"."s_store_name" = 'ese')
    ) s5
, (
    SELECT "count"(*) "h11_to_11_30"
    FROM
        tpcds.tiny.store_sales
    , tpcds.tiny.household_demographics
    , tpcds.tiny.time_dim
    , tpcds.tiny.store
    WHERE ("ss_sold_time_sk" = "time_dim"."t_time_sk")
        AND ("ss_hdemo_sk" = "household_demographics"."hd_demo_sk")
        AND ("ss_store_sk" = "s_store_sk")
        AND ("time_dim"."t_hour" = 11)
        AND ("time_dim"."t_minute" < 30)
        AND (((("household_demographics"."hd_dep_count" = 4)
            AND ("household_demographics"."hd_vehicle_count" <= (4 + 2)))
            OR ((("household_demographics"."hd_dep_count" = 2)
                AND ("household_demographics"."hd_vehicle_count" <= (2 + 2)))
            OR ((("household_demographics"."hd_dep_count" = 0)
                AND ("household_demographics"."hd_vehicle_count" <= (0 + 2))))))
        AND ("store"."s_store_name" = 'ese')
    ) s6
, (
    SELECT "count"(*) "h11_30_to_12"
    FROM
        tpcds.tiny.store_sales
    , tpcds.tiny.household_demographics
    , tpcds.tiny.time_dim
    , tpcds.tiny.store
    WHERE ("ss_sold_time_sk" = "time_dim"."t_time_sk")
        AND ("ss_hdemo_sk" = "household_demographics"."hd_demo_sk")
        AND ("ss_store_sk" = "s_store_sk")
        AND ("time_dim"."t_hour" = 11)
        AND ("time_dim"."t_minute" >= 30)
        AND (((("household_demographics"."hd_dep_count" = 4)
            AND ("household_demographics"."hd_vehicle_count" <= (4 + 2)))
            OR ((("household_demographics"."hd_dep_count" = 2)
                AND ("household_demographics"."hd_vehicle_count" <= (2 + 2)))
            OR ((("household_demographics"."hd_dep_count" = 0)
                AND ("household_demographics"."hd_vehicle_count" <= (0 + 2))))))
        AND ("store"."s_store_name" = 'ese')
    ) s7

```

```
, (
  SELECT "count"(*) "h12_to_12_30"
  FROM
    tpcds.tiny.store_sales
  , tpcds.tiny.household_demographics
  , tpcds.tiny.time_dim
  , tpcds.tiny.store
  WHERE ("ss_sold_time_sk" = "time_dim"."t_time_sk")
    AND ("ss_hdemo_sk" = "household_demographics"."hd_demo_sk")
    AND ("ss_store_sk" = "s_store_sk")
    AND ("time_dim"."t_hour" = 12)
    AND ("time_dim"."t_minute" < 30)
    AND (((("household_demographics"."hd_dep_count" = 4)
      AND ("household_demographics"."hd_vehicle_count" <= (4 + 2)))
    OR ((("household_demographics"."hd_dep_count" = 2)
      AND ("household_demographics"."hd_vehicle_count" <= (2 + 2)))
    OR ((("household_demographics"."hd_dep_count" = 0)
      AND ("household_demographics"."hd_vehicle_count" <= (0 + 2))))))
    AND ("store"."s_store_name" = 'ese')
) s8
```

Results: completed in 2 sec

```
+++++
[(0, 0, 0, 0, 0, 0, 0, 0)]
```

SQL name: ./benchmark/tpcds/q89.sql...

=====

```
SELECT *
FROM
  (
    SELECT
      "i_category"
    , "i_class"
    , "i_brand"
    , "s_store_name"
    , "s_company_name"
    , "d_moy"
    , "sum"("ss_sales_price") "sum_sales"
    , "avg"("sum"("ss_sales_price")) OVER (PARTITION BY "i_category", "i_brand", "s_store_name", "s_
```

```

company_name") "avg_monthly_sales"
FROM
  tpcds.tiny.item
  , tpcds.tiny.store_sales
  , tpcds.tiny.date_dim
  , tpcds.tiny.store
WHERE ("ss_item_sk" = "i_item_sk")
  AND ("ss_sold_date_sk" = "d_date_sk")
  AND ("ss_store_sk" = "s_store_sk")
  AND ("d_year" IN (1999))
  AND (((("i_category" IN ('Books'          , 'Electronics'          , 'Sports'))
    AND ("i_class" IN ('computers'        , 'stereo'          , 'football'))
  OR (("i_category" IN ('Men'            , 'Jewelry'          , 'Women'))
    AND ("i_class" IN ('shirts'          , 'birdal'          , 'dresses'))))
GROUP BY "i_category", "i_class", "i_brand", "s_store_name", "s_company_name", "d_moy"
) tmp1
WHERE ((CASE WHEN ("avg_monthly_sales" <> 0) THEN ("abs"("sum_sales" - "avg_monthly_sales")) / "avg_monthly_sales") ELSE null END) > DECIMAL '0.1')
ORDER BY ("sum_sales" - "avg_monthly_sales") ASC, "s_store_name" ASC
LIMIT 100

```

Results: completed in 2 sec

```

+++++
['Women', 'dresses', 'ought', 'Unknown', 3, '95.65', '609.84'),
['Women', 'dresses', 'able', 'Unknown', 7, '99.64', '603.49'),
['Women', 'dresses', 'able', 'Unknown', 6, '102.02', '603.49'),
['Men', 'shirts', 'able', 'Unknown', 3, '228.92', '695.05'),
['Men', 'shirts', 'able', 'Unknown', 6, '267.60', '695.05')]

```

SQL name: ./benchmark/tpcds/q90.sql...

```

=====
SELECT (CAST("amc" AS DECIMAL(15,4)) / CAST("pmc" AS DECIMAL(15,4))) "am_pm_ratio"
FROM
  (
    SELECT "count"(*) "amc"

```

```

FROM
    tpcds.tiny.web_sales
, tpcds.tiny.household_demographics
, tpcds.tiny.time_dim
, tpcds.tiny.web_page
WHERE ("ws_sold_time_sk" = "time_dim"."t_time_sk")
    AND ("ws_ship_hdemo_sk" = "household_demographics"."hd_demo_sk")
    AND ("ws_web_page_sk" = "web_page"."wp_web_page_sk")
    AND ("time_dim"."t_hour" BETWEEN 8 AND (8 + 1))
    AND ("household_demographics"."hd_dep_count" = 6)
    AND ("web_page"."wp_char_count" BETWEEN 5000 AND 5200)
) "at"
, (
    SELECT "count"(*) "pmc"
    FROM
        tpcds.tiny.web_sales
    , tpcds.tiny.household_demographics
    , tpcds.tiny.time_dim
    , tpcds.tiny.web_page
    WHERE ("ws_sold_time_sk" = "time_dim"."t_time_sk")
        AND ("ws_ship_hdemo_sk" = "household_demographics"."hd_demo_sk")
        AND ("ws_web_page_sk" = "web_page"."wp_web_page_sk")
        AND ("time_dim"."t_hour" BETWEEN 19 AND (19 + 1))
        AND ("household_demographics"."hd_dep_count" = 6)
        AND ("web_page"."wp_char_count" BETWEEN 5000 AND 5200)
    ) pt
ORDER BY "am_pm_ratio" ASC
LIMIT 100

```

Traceback (most recent call last):

```

File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py", line 1815, in _execute_context
    result = context._setup_result_proxy()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/default.py", line 1409, in _setup_result_proxy
    result = self._setup_dml_or_text_result()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/default.py", line 1491, in _setup_dml_or_text_result
    strategy.alternate_cursor_description or self.cursor.description
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 225, in description

```



```

        self._fetch_while(
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 46, i
n _fetch_while
    self._fetch_more()
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 308,
in _fetch_more
    self._process_response(self._requests_session.get(self._nextUri, **self._requests_kwargs))
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 349,
in _process_response
    raise DatabaseError(response_json['error'])
pyhive.exc.DatabaseError: {'message': 'Division by zero', 'errorCode': 8, 'errorName': 'DIVISION_BY
_ZERO', 'errorType': 'USER_ERROR', 'boolean': False, 'failureInfo': {'type': 'com.facebook.presto.s
pi.PrestoException', 'message': 'Division by zero', 'suppressed': [], 'stack': ['com.facebook.prest
o.type.DecimalOperators.divideShortShortLong(DecimalOperators.java:400)', 'com.facebook.presto.$ge
n.PageProjectionWork_20211021_030806_1619.evaluate(Unknown Source)', 'com.facebook.presto.$gen.Page
ProjectionWork_20211021_030806_1619.process(Unknown Source)', 'com.facebook.presto.operator.project
t.PageProcessor$ProjectSelectedPositions.processBatch(PageProcessor.java:326)', 'com.facebook.prest
o.operator.project.PageProcessor$ProjectSelectedPositions.process(PageProcessor.java:197)', 'com.fac
ebook.presto.operator.WorkProcessorUtils$ProcessWorkProcessor.process(WorkProcessorUtils.java:31
5)', 'com.facebook.presto.operator.WorkProcessorUtils$YieldingIterator.computeNext(WorkProcessorUti
ls.java:79)', 'com.facebook.presto.operator.WorkProcessorUtils$YieldingIterator.computeNext(WorkPro
cessorUtils.java:65)', 'com.google.common.collect.AbstractIterator.tryToComputeNext(AbstractIterato
r.java:141)', 'com.google.common.collect.AbstractIterator.hasNext(AbstractIterator.java:136)', 'co
m.facebook.presto.operator.project.MergingPageOutput.getOutput(MergingPageOutput.java:113)', 'com.f
acebook.presto.operator.FilterAndProjectOperator.getOutput(FilterAndProjectOperator.java:102)', 'co
m.facebook.presto.operator.Driver.processInternal(Driver.java:418)', 'com.facebook.presto.operator.
Driver.lambda$processFor$9(Driver.java:301)', 'com.facebook.presto.operator.Driver.tryWithLock(Driv
er.java:722)', 'com.facebook.presto.operator.Driver.processFor(Driver.java:294)', 'com.facebook.pre
sto.execution.SqlTaskExecution$DriverSplitRunner.processFor(SqlTaskExecution.java:1077)', 'com.face
book.presto.execution.executor.PrioritizedSplitRunner.process(PrioritizedSplitRunner.java:162)', 'c
om.facebook.presto.execution.executor.TaskExecutor$TaskRunner.run(TaskExecutor.java:599)', 'com.fac
ebook.presto.$gen.Presto_0_263_b9fd4d4____20211010_164639_1.run(Unknown Source)', 'java.base/java.u
til.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1128)', 'java.base/java.util.co
ncurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:628)', 'java.base/java.lang.Thread.r
un(Thread.java:829)']}

```

The above exception was the direct cause of the following exception:

Traceback (most recent call last):

```

File "/tmp/ipykernel_394536/722970930.py", line 13, in <module>
    rs = conn.execute(sql)
File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py", l
ine 1271, in execute

```

```

        return self._exec_driver_sql(
    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py", l
ine 1575, in _exec_driver_sql
        ret = self._execute_context(
    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py", l
ine 1842, in _execute_context
            self._handle_dbapi_exception(
    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py", l
ine 2023, in _handle_dbapi_exception
                util.raise_(
    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/util/compat.py", l
ine 207, in raise_
                    raise exception
    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/base.py", l
ine 1815, in _execute_context
        result = context._setup_result_proxy()
    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/default.p
y", line 1409, in _setup_result_proxy
        result = self._setup_dml_or_text_result()
    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/sqlalchemy/engine/default.p
y", line 1491, in _setup_dml_or_text_result
        strategy.alternate_cursor_description or self.cursor.description
    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 225,
in description
        self._fetch_while(
    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/common.py", line 46, i
n _fetch_while
        self._fetch_more()
    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 308,
in _fetch_more
        self._process_response(self._requests_session.get(self._nextUri, **self._requests_kwargs))
    File "/home/wengong/anaconda3/envs/py39/lib/python3.9/site-packages/pyhive/presto.py", line 349,
in _process_response
        raise DatabaseError(response_json['error'])
sqlalchemy.exc.DatabaseError: (pyhive.exc.DatabaseError) {'message': 'Division by zero', 'errorCod
e': 8, 'errorName': 'DIVISION_BY_ZERO', 'errorType': 'USER_ERROR', 'boolean': False, 'failureInfo':
{'type': 'com.facebook.presto.spi.PrestoException', 'message': 'Division by zero', 'suppressed':
[], 'stack': ['com.facebook.presto.type.DecimalOperators.divideShortShortLong(DecimalOperators.jav
a:400)', 'com.facebook.presto.$gen.PageProjectionWork_20211021_030806_1619.evaluate(Unknown Sourc
e)', 'com.facebook.presto.$gen.PageProjectionWork_20211021_030806_1619.process(Unknown Source)', 'c
om.facebook.presto.operator.project.PageProcessor$ProjectSelectedPositions.processBatch(PageProcess
or.java:326)', 'com.facebook.presto.operator.project.PageProcessor$ProjectSelectedPositions.process
(PageProcessor.java:197)', 'com.facebook.presto.operator.WorkProcessorUtils$ProcessWorkProcessor.pr

```

```

ocess(WorkProcessorUtils.java:315)', 'com.facebook.presto.operator.WorkProcessorUtils$YieldingItera
tor.computeNext(WorkProcessorUtils.java:79)', 'com.facebook.presto.operator.WorkProcessorUtils$Yiel
dingIterator.computeNext(WorkProcessorUtils.java:65)', 'com.google.common.collect.AbstractIterator.
tryToComputeNext(AbstractIterator.java:141)', 'com.google.common.collect.AbstractIterator.hasNext(A
bstractIterator.java:136)', 'com.facebook.presto.operator.project.MergingPageOutput.getOutput(Mergi
ngPageOutput.java:113)', 'com.facebook.presto.operator.FilterAndProjectOperator.getOutput(FilterAnd
ProjectOperator.java:102)', 'com.facebook.presto.operator.Driver.processInternal(Driver.java:418)',
'com.facebook.presto.operator.Driver.lambda$processFor$9(Driver.java:301)', 'com.facebook.presto.op
erator.Driver.tryWithLock(Driver.java:722)', 'com.facebook.presto.operator.Driver.processFor(Drive
r.java:294)', 'com.facebook.presto.execution.SqlTaskExecution$DriverSplitRunner.processFor(SqlTaskE
xecution.java:1077)', 'com.facebook.presto.execution.executor.PrioritizedSplitRunner.process(Priori
tizedSplitRunner.java:162)', 'com.facebook.presto.execution.executor.TaskExecutor$TaskRunner.run(Ta
skExecutor.java:599)', 'com.facebook.presto.$gen.Presto_0_263_b9fd4d4____20211010_164639_1.run(Unkn
own Source)', 'java.base/java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:
1128)', 'java.base/java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:62
8)', 'java.base/java.lang.Thread.run(Thread.java:829)']}]

```

```

[SQL: SELECT (CAST("amc" AS DECIMAL(15,4)) / CAST("pmc" AS DECIMAL(15,4))) "am_pm_ratio"
FROM

```

```

(
  SELECT "count"(*) "amc"
  FROM
    tpcds.tiny.web_sales
  , tpcds.tiny.household_demographics
  , tpcds.tiny.time_dim
  , tpcds.tiny.web_page
  WHERE ("ws_sold_time_sk" = "time_dim"."t_time_sk")
    AND ("ws_ship_hdemo_sk" = "household_demographics"."hd_demo_sk")
    AND ("ws_web_page_sk" = "web_page"."wp_web_page_sk")
    AND ("time_dim"."t_hour" BETWEEN 8 AND (8 + 1))
    AND ("household_demographics"."hd_dep_count" = 6)
    AND ("web_page"."wp_char_count" BETWEEN 5000 AND 5200)
) "at"
, (
  SELECT "count"(*) "pmc"
  FROM
    tpcds.tiny.web_sales
  , tpcds.tiny.household_demographics
  , tpcds.tiny.time_dim
  , tpcds.tiny.web_page
  WHERE ("ws_sold_time_sk" = "time_dim"."t_time_sk")
    AND ("ws_ship_hdemo_sk" = "household_demographics"."hd_demo_sk")
    AND ("ws_web_page_sk" = "web_page"."wp_web_page_sk")
    AND ("time_dim"."t_hour" BETWEEN 19 AND (19 + 1))
)

```

```

        AND ("household_demographics"."hd_dep_count" = 6)
        AND ("web_page"."wp_char_count" BETWEEN 5000 AND 5200)
    ) pt
ORDER BY "am_pm_ratio" ASC
LIMIT 100
]
(Background on this error at: https://sqlalche.me/e/14/4xp6) (https://sqlalche.me/e/14/4xp6)

```

SQL name: ./benchmark/tpcds/q91.sql...

=====

```

SELECT
    "cc_call_center_id" "Call_Center"
    , "cc_name" "Call_Center_Name"
    , "cc_manager" "Manager"
    , "sum"("cr_net_loss") "Returns_Loss"
FROM
    tpcds.tiny.call_center
    , tpcds.tiny.catalog_returns
    , tpcds.tiny.date_dim
    , tpcds.tiny.customer
    , tpcds.tiny.customer_address
    , tpcds.tiny.customer_demographics
    , tpcds.tiny.household_demographics
WHERE ("cr_call_center_sk" = "cc_call_center_sk")
    AND ("cr_returned_date_sk" = "d_date_sk")
    AND ("cr_returning_customer_sk" = "c_customer_sk")
    AND ("cd_demo_sk" = "c_current_demo_sk")
    AND ("hd_demo_sk" = "c_current_hdemo_sk")
    AND ("ca_address_sk" = "c_current_addr_sk")
    AND ("d_year" = 1998)
    AND ("d_moy" = 11)
    AND (((("cd_marital_status" = 'M')
        AND ("cd_education_status" = 'Unknown'))
    OR ((("cd_marital_status" = 'W')
        AND ("cd_education_status" = 'Advanced Degree'))))
    AND ("hd_buy_potential" LIKE 'Unknown')
    AND ("ca_gmt_offset" = -7)
GROUP BY "cc_call_center_id", "cc_name", "cc_manager", "cd_marital_status", "cd_education_status"
ORDER BY "sum"("cr_net_loss") DESC

```

Results: completed in 2 sec

++++
[]

SQL name: ./benchmark/tpcds/q92.sql...

=====

```
SELECT "sum"("ws_ext_discount_amt") "Excess Discount Amount"
FROM
  tpcds.tiny.web_sales
, tpcds.tiny.item
, tpcds.tiny.date_dim
WHERE ("i_manufact_id" = 350)
  AND ("i_item_sk" = "ws_item_sk")
  AND ("d_date" BETWEEN CAST('2000-01-27' AS DATE) AND (CAST('2000-01-27' AS DATE) + INTERVAL '90' DAY))
  AND ("d_date_sk" = "ws_sold_date_sk")
  AND ("ws_ext_discount_amt" > (
    SELECT (DECIMAL '1.3' * "avg"("ws_ext_discount_amt"))
    FROM
      tpcds.tiny.web_sales
    , tpcds.tiny.date_dim
    WHERE ("ws_item_sk" = "i_item_sk")
      AND ("d_date" BETWEEN CAST('2000-01-27' AS DATE) AND (CAST('2000-01-27' AS DATE) + INTERVAL '90' DAY))
      AND ("d_date_sk" = "ws_sold_date_sk")
  ))
ORDER BY "sum"("ws_ext_discount_amt") ASC
LIMIT 100
```

Results: completed in 1 sec

++++
[(None,)]

SQL name: ./benchmark/tpcds/q93.sql...

=====

```
SELECT
  "ss_customer_sk"
```

```
, "sum"("act_sales") "sumsales"
FROM
(
  SELECT
    "ss_item_sk"
    , "ss_ticket_number"
    , "ss_customer_sk"
    , (CASE WHEN ("sr_return_quantity" IS NOT NULL) THEN (("ss_quantity" - "sr_return_quantity") *
"ss_sales_price") ELSE ("ss_quantity" * "ss_sales_price") END) "act_sales"
  FROM
    (tpcds.tiny.store_sales
  LEFT JOIN tpcds.tiny.store_returns ON ("sr_item_sk" = "ss_item_sk")
    AND ("sr_ticket_number" = "ss_ticket_number"))
    , tpcds.tiny.reason
  WHERE ("sr_reason_sk" = "r_reason_sk")
    AND ("r_reason_desc" = 'reason 28')
) t
GROUP BY "ss_customer_sk"
ORDER BY "sumsales" ASC, "ss_customer_sk" ASC
LIMIT 100
```

```
Results: completed in 2 sec
+++++
[]
```

SQL name: ./benchmark/tpcds/q94.sql...

=====

```
SELECT
  "count"(DISTINCT "ws_order_number") "order count"
  , "sum"("ws_ext_ship_cost") "total shipping cost"
  , "sum"("ws_net_profit") "total net profit"
FROM
  tpcds.tiny.web_sales ws1
  , tpcds.tiny.date_dim
  , tpcds.tiny.customer_address
  , tpcds.tiny.web_site
WHERE ("d_date" BETWEEN CAST('1999-2-01' AS DATE) AND (CAST('1999-2-01' AS DATE) + INTERVAL '60' D
AY))
  AND ("ws1"."ws_ship_date_sk" = "d_date_sk")
  AND ("ws1"."ws_ship_addr_sk" = "ca_address_sk")
```

```

AND ("ca_state" = 'IL')
AND ("ws1"."ws_web_site_sk" = "web_site_sk")
AND ("web_company_name" = 'pri')
AND (EXISTS (
  SELECT *
  FROM
    tpcds.tiny.web_sales ws2
  WHERE ("ws1"."ws_order_number" = "ws2"."ws_order_number")
        AND ("ws1"."ws_warehouse_sk" <> "ws2"."ws_warehouse_sk")
))
AND (NOT (EXISTS (
  SELECT *
  FROM
    tpcds.tiny.web_returns wr1
  WHERE ("ws1"."ws_order_number" = "wr1"."wr_order_number")
)))
ORDER BY "count"(DISTINCT "ws_order_number") ASC
LIMIT 100

```

Results: completed in 1 sec
 ++++++
 [(0, None, None)]

SQL name: ./benchmark/tpcds/q95.sql...

```

=====
WITH
  ws_wh AS (
    SELECT
      "ws1"."ws_order_number"
    , "ws1"."ws_warehouse_sk" "wh1"
    , "ws2"."ws_warehouse_sk" "wh2"
    FROM
      tpcds.tiny.web_sales ws1
    , tpcds.tiny.web_sales ws2
    WHERE ("ws1"."ws_order_number" = "ws2"."ws_order_number")
          AND ("ws1"."ws_warehouse_sk" <> "ws2"."ws_warehouse_sk")
  )
SELECT
  "count"(DISTINCT "ws_order_number") "order count"
, "sum"("ws_ext_ship_cost") "total shipping cost"

```

```

, "sum"("ws_net_profit") "total net profit"
FROM
  tpcds.tiny.web_sales ws1
, tpcds.tiny.date_dim
, tpcds.tiny.customer_address
, tpcds.tiny.web_site
WHERE (CAST("d_date" AS DATE) BETWEEN CAST('1999-2-01' AS DATE) AND (CAST('1999-2-01' AS DATE) + IN
TERVAL '60' DAY))
  AND ("ws1"."ws_ship_date_sk" = "d_date_sk")
  AND ("ws1"."ws_ship_addr_sk" = "ca_address_sk")
  AND ("ca_state" = 'IL')
  AND ("ws1"."ws_web_site_sk" = "web_site_sk")
  AND ("web_company_name" = 'pri')
  AND ("ws1"."ws_order_number" IN (
    SELECT "ws_order_number"
    FROM
      ws_wh
  ))
  AND ("ws1"."ws_order_number" IN (
    SELECT "wr_order_number"
    FROM
      tpcds.tiny.web_returns
    , ws_wh
    WHERE ("wr_order_number" = "ws_wh"."ws_order_number")
  ))
ORDER BY "count"(DISTINCT "ws_order_number") ASC
LIMIT 100

```

Results: completed in 1 sec

```

+++++
[(0, None, None)]

```

SQL name: ./benchmark/tpcds/q96.sql...

=====

```

SELECT "count"(*)
FROM
  tpcds.tiny.store_sales
, tpcds.tiny.household_demographics
, tpcds.tiny.time_dim
, tpcds.tiny.store

```



```

WHERE ("ss_sold_time_sk" = "time_dim"."t_time_sk")
  AND ("ss_hdemo_sk" = "household_demographics"."hd_demo_sk")
  AND ("ss_store_sk" = "s_store_sk")
  AND ("time_dim"."t_hour" = 20)
  AND ("time_dim"."t_minute" >= 30)
  AND ("household_demographics"."hd_dep_count" = 7)
  AND ("store"."s_store_name" = 'ese')
ORDER BY "count"(*) ASC
LIMIT 100

```

Results: completed in 1 sec

```

+++++
[(0,)]

```

SQL name: ./benchmark/tpcds/q97.sql...

=====

WITH

```

  ssci AS (
    SELECT
      "ss_customer_sk" "customer_sk"
    , "ss_item_sk" "item_sk"
    FROM
      tpcds.tiny.store_sales
    , tpcds.tiny.date_dim
    WHERE ("ss_sold_date_sk" = "d_date_sk")
      AND ("d_month_seq" BETWEEN 1200 AND (1200 + 11))
    GROUP BY "ss_customer_sk", "ss_item_sk"
  )
, csci AS (
  SELECT
    "cs_bill_customer_sk" "customer_sk"
  , "cs_item_sk" "item_sk"
  FROM
    tpcds.tiny.catalog_sales
  , tpcds.tiny.date_dim
  WHERE ("cs_sold_date_sk" = "d_date_sk")
    AND ("d_month_seq" BETWEEN 1200 AND (1200 + 11))
  GROUP BY "cs_bill_customer_sk", "cs_item_sk"
)
SELECT

```

```

    "sum"((CASE WHEN ("ssci"."customer_sk" IS NOT NULL)
    AND ("csci"."customer_sk" IS NULL) THEN 1 ELSE 0 END)) "store_only"
, "sum"((CASE WHEN ("ssci"."customer_sk" IS NULL)
    AND ("csci"."customer_sk" IS NOT NULL) THEN 1 ELSE 0 END)) "catalog_only"
, "sum"((CASE WHEN ("ssci"."customer_sk" IS NOT NULL)
    AND ("csci"."customer_sk" IS NOT NULL) THEN 1 ELSE 0 END)) "store_and_catalog"
FROM
    (ssci
FULL JOIN csci ON ("ssci"."customer_sk" = "csci"."customer_sk")
    AND ("ssci"."item_sk" = "csci"."item_sk"))
LIMIT 100

```

Results: completed in 2 sec

+++++

[(22255, 16944, 391)]

SQL name: ./benchmark/tpcds/q98.sql...

=====

```

SELECT
    "i_item_id"
, "i_item_desc"
, "i_category"
, "i_class"
, "i_current_price"
, "sum"("ss_ext_sales_price") "tpcds.tiny.itemrevenue"
, (("sum"("ss_ext_sales_price") * 100) / "sum"("sum"("ss_ext_sales_price"))) OVER (PARTITION BY "i_c
lass")) "revenueration"
FROM
    tpcds.tiny.store_sales
, tpcds.tiny.item
, tpcds.tiny.date_dim
WHERE ("ss_item_sk" = "i_item_sk")
    AND ("i_category" IN ('Sports', 'Books', 'Home'))
    AND ("ss_sold_date_sk" = "d_date_sk")
    AND (CAST("d_date" AS DATE) BETWEEN CAST('1999-02-22' AS DATE) AND (CAST('1999-02-22' AS DATE) +
INTERVAL '30' DAY))
GROUP BY "i_item_id", "i_item_desc", "i_category", "i_class", "i_current_price"
ORDER BY "i_category" ASC, "i_class" ASC, "i_item_id" ASC, "i_item_desc" ASC, "revenueration" ASC

```

Results: completed in 2 sec

+++++

```
[('AAAAAAACKKEAAAA', 'Legs appear eventually soci', 'Books', 'arts', '35.27', '3072.84', '19.03'), ('AAAAAAAIJGAAAA', 'Then western animals could teach somewhere. Today waiting servants confuse', 'Books', 'arts', '4.10', '6979.62', '43.22'), ('AAAAAAAMFFAAAA', 'Communities used to relocate clearly strange, new walls; european, rich championships make current depths. Sure studies may reflect only instinctively old forces. Foreign, diverse', 'Books', 'arts', '8.22', '496.91', '3.08'), ('AAAAAAANIBAAA', 'Beneath decent wives write t', 'Books', 'arts', '2.72', '5600.40', '34.68'), ('AAAAAAADFAAAAA', 'Satisfactory, technical shadows get. Lexical structures would not blame. Only hard', 'Books', 'bus', '78.25', '1292.16', '44.62')]
```

SQL name: ./benchmark/tpcds/q99.sql...

=====

SELECT

```
  "substr"("w_warehouse_name", 1, 20)
, "sm_type"
, "cc_name"
, "sum"((CASE WHEN (("cs_ship_date_sk" - "cs_sold_date_sk") <= 30) THEN 1 ELSE 0 END)) "30 days"
, "sum"((CASE WHEN (("cs_ship_date_sk" - "cs_sold_date_sk") > 30)
  AND (("cs_ship_date_sk" - "cs_sold_date_sk") <= 60) THEN 1 ELSE 0 END)) "31-60 days"
, "sum"((CASE WHEN (("cs_ship_date_sk" - "cs_sold_date_sk") > 60)
  AND (("cs_ship_date_sk" - "cs_sold_date_sk") <= 90) THEN 1 ELSE 0 END)) "61-90 days"
, "sum"((CASE WHEN (("cs_ship_date_sk" - "cs_sold_date_sk") > 90)
  AND (("cs_ship_date_sk" - "cs_sold_date_sk") <= 120) THEN 1 ELSE 0 END)) "91-120 days"
, "sum"((CASE WHEN (("cs_ship_date_sk" - "cs_sold_date_sk") > 120) THEN 1 ELSE 0 END)) ">120 days"
```

FROM

```
  tpcds.tiny.catalog_sales
, tpcds.tiny.warehouse
, tpcds.tiny.ship_mode
, tpcds.tiny.call_center
, tpcds.tiny.date_dim
WHERE ("d_month_seq" BETWEEN 1200 AND (1200 + 11))
  AND ("cs_ship_date_sk" = "d_date_sk")
  AND ("cs_warehouse_sk" = "w_warehouse_sk")
  AND ("cs_ship_mode_sk" = "sm_ship_mode_sk")
  AND ("cs_call_center_sk" = "cc_call_center_sk")
```

GROUP BY "substr"("w_warehouse_name", 1, 20), "sm_type", "cc_name"

ORDER BY "substr"("w_warehouse_name", 1, 20) ASC, "sm_type" ASC, "cc_name" ASC

LIMIT 100

Results: completed in 2 sec

+++++

```
[('Conventional childr', 'EXPRESS', 'Mid Atlantic', 520, 567, 562, 0, 0),
('Conventional childr', 'EXPRESS', 'NY Metro', 590, 679, 571, 0, 0), ('Conve
ntional childr', 'LIBRARY', 'Mid Atlantic', 378, 420, 457, 0, 0), ('Conventi
onal childr', 'LIBRARY', 'NY Metro', 426, 474, 442, 0, 0), ('Conventional ch
ildr', 'NEXT DAY', 'Mid Atlantic', 544, 570, 581, 0, 0)]
```

In []:

1