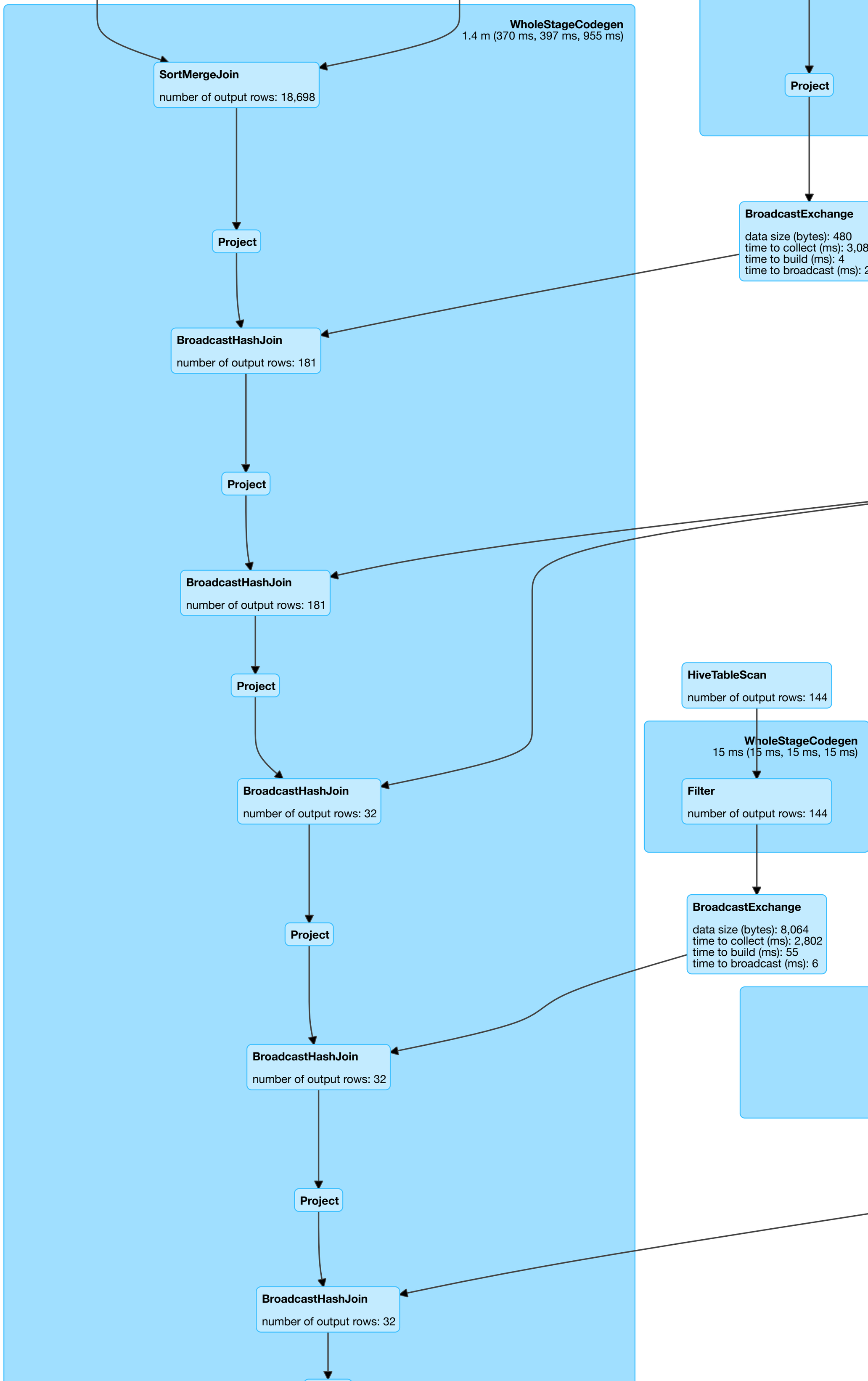
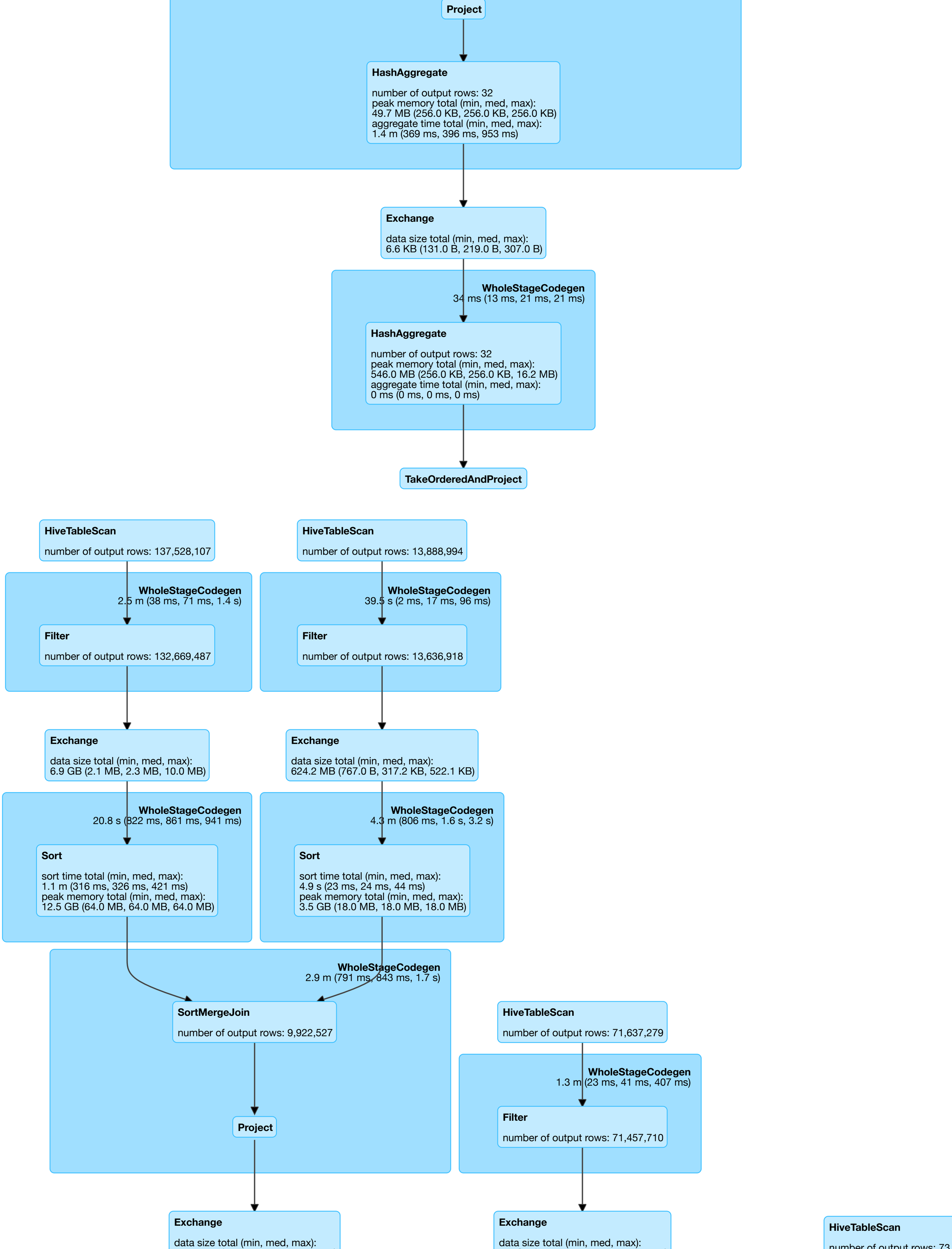
Details for Query 1

Submitted Time: 2018/02/26 00:41:15
Duration: 14 min
Succeeded Jobs: 0 (/history/application_1519504339627_0146/jobs/job?id=0) 1 (/history/application_1519504339627_0146/jobs/job?id=1) 2 (/history/application_1519504339627_0146/jobs/job?id=2) 3 (/history/application_1519504339627_0146/jobs/job?id=3) 4 (/history/application_1519504339627_0146/jobs/job?id=4)


WholeStageCodegen
1.4 m (370 ms, 397 ms, 955 ms)
SortMergeJoin
number of output rows: 18,698
Project
BroadcastHashJoin
number of output rows: 181
Project
BroadcastHashJoin
number of output rows: 32
Project
BroadcastHashJoin
number of output rows: 32
Project
BroadcastHashJoin
number of output rows: 32
Project
BroadcastExchange
data size (bytes): 480
time to collect (ms): 3,08
time to build (ms): 4
time to broadcast (ms): 2
HiveTableScan
number of output rows: 144
WholeStageCodegen
15 ms (15 ms, 15 ms, 15 ms)
Filter
number of output rows: 144
BroadcastExchange
data size (bytes): 8,064
time to collect (ms): 2,802
time to build (ms): 55
time to broadcast (ms): 6


Project
HashAggregate
number of output rows: 32
peak memory total (min, med, max):
49.7 MB (256.0 KB, 256.0 KB, 256.0 KB)
aggregate time total (min, med, max):
1.4 m (369 ms, 396 ms, 953 ms)
Exchange
data size total (min, med, max):
6.6 KB (131.0 B, 219.0 B, 307.0 B)
WholeStageCodegen
34 ms (13 ms, 21 ms, 21 ms)
HashAggregate
number of output rows: 32
peak memory total (min, med, max):
546.0 MB (256.0 KB, 256.0 KB, 16.2 MB)
aggregate time total (min, med, max):
0 ms (0 ms, 0 ms, 0 ms)
TakeOrderedAndProject
HiveTableScan
number of output rows: 137,528,107
WholeStageCodegen
2.5 m (38 ms, 71 ms, 1.4 s)
Filter
number of output rows: 132,669,487
HiveTableScan
number of output rows: 13,888,994
WholeStageCodegen
39.5 s (2 ms, 17 ms, 96 ms)
Filter
number of output rows: 13,636,918
Exchange
data size total (min, med, max):
6.9 GB (2.1 MB, 2.3 MB, 10.0 MB)
Exchange
data size total (min, med, max):
624.2 MB (767.0 B, 317.2 KB, 522.1 KB)
WholeStageCodegen
20.8 s (822 ms, 861 ms, 941 ms)
Sort
sort time total (min, med, max):
1.1 m (316 ms, 326 ms, 421 ms)
peak memory total (min, med, max):
12.5 GB (64.0 MB, 64.0 MB, 64.0 MB)
WholeStageCodegen
4.3 m (806 ms, 1.6 s, 3.2 s)
Sort
sort time total (min, med, max):
4.9 s (23 ms, 24 ms, 44 ms)
peak memory total (min, med, max):
3.5 GB (18.0 MB, 18.0 MB, 18.0 MB)
WholeStageCodegen
2.9 m (791 ms, 843 ms, 1.7 s)
SortMergeJoin
number of output rows: 9,922,527
Project
HiveTableScan
number of output rows: 71,637,279
WholeStageCodegen
1.3 m (23 ms, 41 ms, 407 ms)
Filter
number of output rows: 71,457,710
Exchange
Exchange
data size total (min, med, max):
HiveTableScan

677.9 MB (3.4 MB, 3.4 MB, 3.4 MB)

2.7 GB (598.7 KB, 890.2 KB, 3.0 MB)

WholeStageCodegen
1.3 m (382 ms, 409 ms, 1.1 s)

Sort

sort time total (min, med, max):
2.4 s (8 ms, 9 ms, 317 ms)
peak memory total (min, med, max):
3.5 GB (18.0 MB, 18.0 MB, 18.0 MB)

WholeStageCodegen
6.1 s (382 ms, 409 ms, 705 ms)

Sort

sort time total (min, med, max):
32.3 s (156 ms, 159 ms, 254 ms)
peak memory total (min, med, max):
6.2 GB (32.0 MB, 32.0 MB, 32.0 MB)

WholeStageCodegen
1.4 m (370 ms, 397 ms, 955 ms)

SortMergeJoin

number of output rows: 18,698

Project

BroadcastHashJoin

number of output rows: 181

Project

BroadcastHashJoin

number of output rows: 181

Project

BroadcastHashJoin

number of output rows: 32

Project

BroadcastHashJoin

number of output rows: 32

WholeStageCodegen
71 ms (71 ms, 71 ms,

Filter

number of output rows: 3

Project

BroadcastExchange

data size (bytes): 480
time to collect (ms): 3,08
time to build (ms): 4
time to broadcast (ms): 2

HiveTableScan

number of output rows: 144

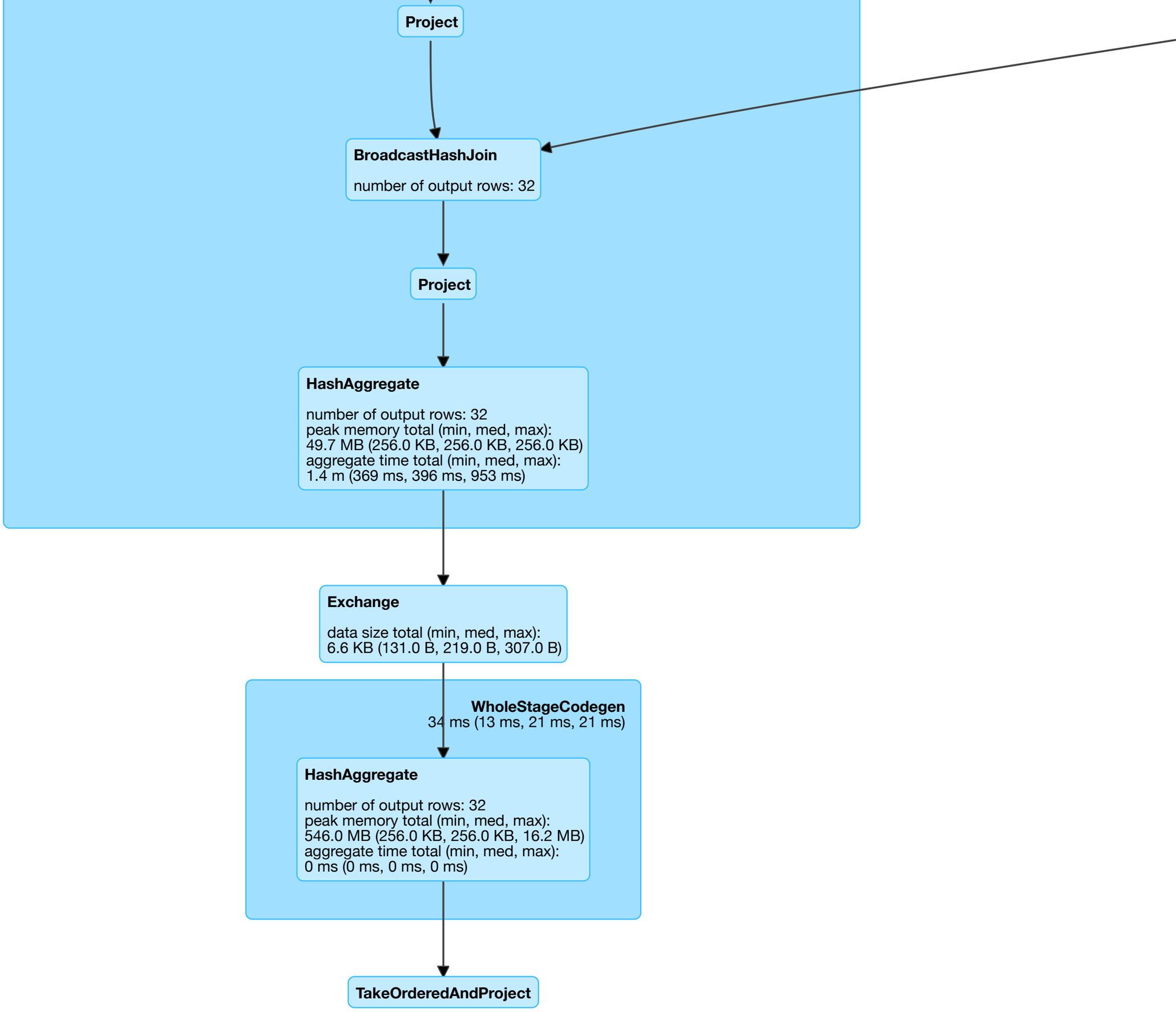
WholeStageCodegen
15 ms (15 ms, 15 ms, 15 ms)

Filter

number of output rows: 144

BroadcastExchange

data size (bytes): 8,064
time to collect (ms): 2,802
time to build (ms): 55
time to broadcast (ms): 6



▼ Details

```
== Parsed Logical Plan ==
GlobalLimit 21
+- LocalLimit 21
   +- GlobalLimit 100
      +- LocalLimit 100
         +- Project [i_item_id#653, i_item_desc#656, s_store_id#624, s_store_name#628, store_sales_profit#459, store_returns_loss#460,
catalog_sales_profit#461]
            +- Sort [i_item_id#653 ASC NULLS FIRST, i_item_desc#656 ASC NULLS FIRST, s_store_id#624 ASC NULLS FIRST, s_store_name#628 ASC NULLS FIRST],
true
               +- Aggregate [i_item_id#653, i_item_desc#656, s_store_id#624, s_store_name#628], [i_item_id#653, i_item_desc#656, s_store_id#624,
s_store_name#628, sum(cast(ss_net_profit#483 as double)) AS store_sales_profit#459, sum(cast(sr_net_loss#503 as double)) AS store_returns_loss#460,
sum(cast(cs_net_profit#537 as double)) AS catalog_sales_profit#461]
                  +- Filter (((((d_moy#547 = 4) && (d_year#545 = 1998)) && ((d_date_sk#539 = ss_sold_date_sk#484) && (i_item_sk#652 = ss_item_sk#463)))
&& (((s_store_sk#623 = ss_store_sk#468) && (ss_customer_sk#464 = sr_customer_sk#487)) && ((ss_item_sk#463 = sr_item_sk#486) && (ss_ticket_number#470L =
sr_ticket_number#493L)))) && ((((sr_returned_date_sk#504 = d_date_sk#567) && ((d_moy#575 >= 4) && (d_moy#575 <= 10))) && ((d_year#573 = 1998) &&
(sr_customer_sk#487 = cs_bill_customer_sk#507))) && (((sr_item_sk#486 = cs_item_sk#519) && (cs_sold_date_sk#538 = d_date_sk#595)) && (((d_moy#603 >= 4)
&& (d_moy#603 <= 10)) && (d_year#601 = 1998)))))
                     +- Join Inner
                        :- Join Inner
                        :  :- Join Inner
                        :  :  :- Join Inner
                        :  :  :  :- Join Inner
                        :  :  :  :  :- Join Inner
                        :  :  :  :  :  :- Join Inner
                        :  :  :  :  :  :  :- SubqueryAlias store_sales
                        :  :  :  :  :  :  :  +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`store_sales`, org.apache.hadoop.hive.ql.io.orc.OrcSerde,
[ss_sold_time_sk#462, ss_item_sk#463, ss_customer_sk#464, ss_cdemo_sk#465, ss_hdemo_sk#466, ss_addr_sk#467, ss_store_sk#468, ss_promo_sk#469,
ss_ticket_number#470L, ss_quantity#471, ss_wholesale_cost#472, ss_list_price#473, ss_sales_price#474, ss_ext_discount_amt#475, ss_ext_sales_price#476,
ss_ext_wholesale_cost#477, ss_ext_list_price#478, ss_ext_tax#479, ss_coupon_amt#480, ss_net_paid#481, ss_net_paid_inc_tax#482, ss_net_profit#483],
[ss_sold_date_sk#484]
                        :  :  :  :  :  :  +- SubqueryAlias store_returns
                        :  :  :  :  :  :     +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`store_returns`,
org.apache.hadoop.hive.ql.io.orc.OrcSerde, [sr_return_time_sk#485, sr_item_sk#486, sr_customer_sk#487, sr_cdemo_sk#488, sr_hdemo_sk#489, sr_addr_sk#490,
sr_store_sk#491, sr_reason_sk#492, sr_ticket_number#493L, sr_return_quantity#494, sr_return_amt#495, sr_return_tax#496, sr_return_amt_inc_tax#497,
sr_fee#498, sr_return_ship_cost#499, sr_refunded_cash#500, sr_reversed_charge#501, sr_store_credit#502, sr_net_loss#503], [sr_returned_date_sk#504]
```

```
                        :  :  :  :  :  +- SubqueryAlias catalog_sales
                        :  :  :  :  :     +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`catalog_sales`, org.apache.hadoop.hive.ql.io.orc.OrcSerde,
[cs_sold_time_sk#505, cs_ship_date_sk#506, cs_bill_customer_sk#507, cs_bill_cdemo_sk#508, cs_bill_hdemo_sk#509, cs_bill_addr_sk#510,
cs_ship_customer_sk#511, cs_ship_cdemo_sk#512, cs_ship_hdemo_sk#513, cs_ship_addr_sk#514, cs_call_center_sk#515, cs_catalog_page_sk#516,
cs_ship_mode_sk#517, cs_warehouse_sk#518, cs_item_sk#519, cs_promo_sk#520, cs_order_number#521L, cs_quantity#522, cs_wholesale_cost#523,
cs_list_price#524, cs_sales_price#525, cs_ext_discount_amt#526, cs_ext_sales_price#527, cs_ext_wholesale_cost#528, ... 9 more fields],
[cs_sold_date_sk#538]
                        :  :  :  :  +- SubqueryAlias d1
                        :  :  :  :     +- SubqueryAlias date_dim
                        :  :  :  :        +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`date_dim`, org.apache.hadoop.hive.ql.io.orc.OrcSerde,
[d_date_sk#539, d_date_id#540, d_date#541, d_month_seq#542, d_week_seq#543, d_quarter_seq#544, d_year#545, d_dow#546, d_moy#547, d_dom#548, d_qoy#549,
d_fy_year#550, d_fy_quarter_seq#551, d_fy_week_seq#552, d_day_name#553, d_quarter_name#554, d_holiday#555, d_weekend#556, d_following_holiday#557,
d_first_dom#558, d_last_dom#559, d_same_day_ly#560, d_same_day_lq#561, d_current_day#562, ... 4 more fields]
                        :  :  :  +- SubqueryAlias d2
                        :  :  :     +- SubqueryAlias date_dim
                        :  :  :        +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`date_dim`, org.apache.hadoop.hive.ql.io.orc.OrcSerde,
[d_date_sk#567, d_date_id#568, d_date#569, d_month_seq#570, d_week_seq#571, d_quarter_seq#572, d_year#573, d_dow#574, d_moy#575, d_dom#576, d_qoy#577,
d_fy_year#578, d_fy_quarter_seq#579, d_fy_week_seq#580, d_day_name#581, d_quarter_name#582, d_holiday#583, d_weekend#584, d_following_holiday#585,
d_first_dom#586, d_last_dom#587, d_same_day_ly#588, d_same_day_lq#589, d_current_day#590, ... 4 more fields]
                        :  :  +- SubqueryAlias d3
                        :  :     +- SubqueryAlias date_dim
                        :  :        +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`date_dim`, org.apache.hadoop.hive.ql.io.orc.OrcSerde,
[d_date_sk#595, d_date_id#596, d_date#597, d_month_seq#598, d_week_seq#599, d_quarter_seq#600, d_year#601, d_dow#602, d_moy#603, d_dom#604, d_qoy#605,
d_fy_year#606, d_fy_quarter_seq#607, d_fy_week_seq#608, d_day_name#609, d_quarter_name#610, d_holiday#611, d_weekend#612, d_following_holiday#613,
d_first_dom#614, d_last_dom#615, d_same_day_ly#616, d_same_day_lq#617, d_current_day#618, ... 4 more fields]
                        :  +- SubqueryAlias store
                        :     +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`store`, org.apache.hadoop.hive.ql.io.orc.OrcSerde, [s_store_sk#623,
s_store_id#624, s_rec_start_date#625, s_rec_end_date#626, s_closed_date_sk#627, s_store_name#628, s_number_employees#629, s_floor_space#630,
s_hours#631, s_manager#632, s_market_id#633, s_geography_class#634, s_market_desc#635, s_market_manager#636, s_division_id#637, s_division_name#638,
s_company_id#639, s_company_name#640, s_street_number#641, s_street_name#642, s_street_type#643, s_suite_number#644, s_city#645, s_county#646, ... 5
more fields]
                           +- SubqueryAlias item
                              +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`item`, org.apache.hadoop.hive.ql.io.orc.OrcSerde, [i_item_sk#652,
i_item_id#653, i_rec_start_date#654, i_rec_end_date#655, i_item_desc#656, i_current_price#657, i_wholesale_cost#658, i_brand_id#659, i_brand#660,
i_class_id#661, i_class#662, i_category_id#663, i_category#664, i_manufact_id#665, i_manufact#666, i_size#667, i_formulation#668, i_color#669,
i_units#670, i_container#671, i_manager_id#672, i_product_name#673]

== Analyzed Logical Plan ==
i_item_id: string, i_item_desc: string, s_store_id: string, s_store_name: string, store_sales_profit: double, store_returns_loss: double,
catalog_sales_profit: double
GlobalLimit 21
+- LocalLimit 21
   +- GlobalLimit 100
      +- LocalLimit 100
         +- Project [i_item_id#653, i_item_desc#656, s_store_id#624, s_store_name#628, store_sales_profit#459, store_returns_loss#460,
catalog_sales_profit#461]
            +- Sort [i_item_id#653 ASC NULLS FIRST, i_item_desc#656 ASC NULLS FIRST, s_store_id#624 ASC NULLS FIRST, s_store_name#628 ASC NULLS FIRST],
true
               +- Aggregate [i_item_id#653, i_item_desc#656, s_store_id#624, s_store_name#628], [i_item_id#653, i_item_desc#656, s_store_id#624,
s_store_name#628, sum(cast(ss_net_profit#483 as double)) AS store_sales_profit#459, sum(cast(sr_net_loss#503 as double)) AS store_returns_loss#460,
sum(cast(cs_net_profit#537 as double)) AS catalog_sales_profit#461]
                  +- Filter (((((d_moy#547 = 4) && (d_year#545 = 1998)) && ((d_date_sk#539 = ss_sold_date_sk#484) && (i_item_sk#652 = ss_item_sk#463)))
&& (((s_store_sk#623 = ss_store_sk#468) && (ss_customer_sk#464 = sr_customer_sk#487)) && ((ss_item_sk#463 = sr_item_sk#486) && (ss_ticket_number#470L =
sr_ticket_number#493L)))) && ((((sr_returned_date_sk#504 = d_date_sk#567) && ((d_moy#575 >= 4) && (d_moy#575 <= 10))) && ((d_year#573 = 1998) &&
(sr_customer_sk#487 = cs_bill_customer_sk#507))) && (((sr_item_sk#486 = cs_item_sk#519) && (cs_sold_date_sk#538 = d_date_sk#595)) && (((d_moy#603 >= 4)
&& (d_moy#603 <= 10)) && (d_year#601 = 1998)))))
                     +- Join Inner
                        :- Join Inner
                        :  :- Join Inner
                        :  :  :- Join Inner
                        :  :  :  :- Join Inner
                        :  :  :  :  :- Join Inner
                        :  :  :  :  :  :- Join Inner
                        :  :  :  :  :  :  :- SubqueryAlias store_sales
                        :  :  :  :  :  :  :  +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`store_sales`, org.apache.hadoop.hive.ql.io.orc.OrcSerde,
[ss_sold_time_sk#462, ss_item_sk#463, ss_customer_sk#464, ss_cdemo_sk#465, ss_hdemo_sk#466, ss_addr_sk#467, ss_store_sk#468, ss_promo_sk#469,
ss_ticket_number#470L, ss_quantity#471, ss_wholesale_cost#472, ss_list_price#473, ss_sales_price#474, ss_ext_discount_amt#475, ss_ext_sales_price#476,
ss_ext_wholesale_cost#477, ss_ext_list_price#478, ss_ext_tax#479, ss_coupon_amt#480, ss_net_paid#481, ss_net_paid_inc_tax#482, ss_net_profit#483],
[ss_sold_date_sk#484]
                        :  :  :  :  :  :  +- SubqueryAlias store_returns
                        :  :  :  :  :  :     +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`store_returns`,
org.apache.hadoop.hive.ql.io.orc.OrcSerde, [sr_return_time_sk#485, sr_item_sk#486, sr_customer_sk#487, sr_cdemo_sk#488, sr_hdemo_sk#489, sr_addr_sk#490,
sr_store_sk#491, sr_reason_sk#492, sr_ticket_number#493L, sr_return_quantity#494, sr_return_amt#495, sr_return_tax#496, sr_return_amt_inc_tax#497,
sr_fee#498, sr_return_ship_cost#499, sr_refunded_cash#500, sr_reversed_charge#501, sr_store_credit#502, sr_net_loss#503], [sr_returned_date_sk#504]
                        :  :  :  :  :  +- SubqueryAlias catalog_sales
                        :  :  :  :  :     +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`catalog_sales`, org.apache.hadoop.hive.ql.io.orc.OrcSerde,
[cs_sold_time_sk#505, cs_ship_date_sk#506, cs_bill_customer_sk#507, cs_bill_cdemo_sk#508, cs_bill_hdemo_sk#509, cs_bill_addr_sk#510,
cs_ship_customer_sk#511, cs_ship_cdemo_sk#512, cs_ship_hdemo_sk#513, cs_ship_addr_sk#514, cs_call_center_sk#515, cs_catalog_page_sk#516,
cs_ship_mode_sk#517, cs_warehouse_sk#518, cs_item_sk#519, cs_promo_sk#520, cs_order_number#521L, cs_quantity#522, cs_wholesale_cost#523,
cs_list_price#524, cs_sales_price#525, cs_ext_discount_amt#526, cs_ext_sales_price#527, cs_ext_wholesale_cost#528, ... 9 more fields],
[cs_sold_date_sk#538]
```

```
                        :  :  :  :  +- SubqueryAlias d1
                        :  :  :  :     +- SubqueryAlias date_dim
                        :  :  :  :        +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`date_dim`, org.apache.hadoop.hive.ql.io.orc.OrcSerde,
[d_date_sk#539, d_date_id#540, d_date#541, d_month_seq#542, d_week_seq#543, d_quarter_seq#544, d_year#545, d_dow#546, d_moy#547, d_dom#548, d_qoy#549,
d_fy_year#550, d_fy_quarter_seq#551, d_fy_week_seq#552, d_day_name#553, d_quarter_name#554, d_holiday#555, d_weekend#556, d_following_holiday#557,
d_first_dom#558, d_last_dom#559, d_same_day_ly#560, d_same_day_lq#561, d_current_day#562, ... 4 more fields]
                        :  :  :  +- SubqueryAlias d2
                        :  :  :     +- SubqueryAlias date_dim
                        :  :  :        +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`date_dim`, org.apache.hadoop.hive.ql.io.orc.OrcSerde,
[d_date_sk#567, d_date_id#568, d_date#569, d_month_seq#570, d_week_seq#571, d_quarter_seq#572, d_year#573, d_dow#574, d_moy#575, d_dom#576, d_qoy#577,
d_fy_year#578, d_fy_quarter_seq#579, d_fy_week_seq#580, d_day_name#581, d_quarter_name#582, d_holiday#583, d_weekend#584, d_following_holiday#585,
d_first_dom#586, d_last_dom#587, d_same_day_ly#588, d_same_day_lq#589, d_current_day#590, ... 4 more fields]
                        :  :  +- SubqueryAlias d3
                        :  :     +- SubqueryAlias date_dim
                        :  :        +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`date_dim`, org.apache.hadoop.hive.ql.io.orc.OrcSerde,
[d_date_sk#595, d_date_id#596, d_date#597, d_month_seq#598, d_week_seq#599, d_quarter_seq#600, d_year#601, d_dow#602, d_moy#603, d_dom#604, d_qoy#605,
d_fy_year#606, d_fy_quarter_seq#607, d_fy_week_seq#608, d_day_name#609, d_quarter_name#610, d_holiday#611, d_weekend#612, d_following_holiday#613,
d_first_dom#614, d_last_dom#615, d_same_day_ly#616, d_same_day_lq#617, d_current_day#618, ... 4 more fields]
                        :  +- SubqueryAlias store
                        :     +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`store`, org.apache.hadoop.hive.ql.io.orc.OrcSerde, [s_store_sk#623,
s_store_id#624, s_rec_start_date#625, s_rec_end_date#626, s_closed_date_sk#627, s_store_name#628, s_number_employees#629, s_floor_space#630,
s_hours#631, s_manager#632, s_market_id#633, s_geography_class#634, s_market_desc#635, s_market_manager#636, s_division_id#637, s_division_name#638,
s_company_id#639, s_company_name#640, s_street_number#641, s_street_name#642, s_street_type#643, s_suite_number#644, s_city#645, s_county#646, ... 5
more fields]
                        +- SubqueryAlias item
                           +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`item`, org.apache.hadoop.hive.ql.io.orc.OrcSerde, [i_item_sk#652,
i_item_id#653, i_rec_start_date#654, i_rec_end_date#655, i_item_desc#656, i_current_price#657, i_wholesale_cost#658, i_brand_id#659, i_brand#660,
i_class_id#661, i_class#662, i_category_id#663, i_category#664, i_manufact_id#665, i_manufact#666, i_size#667, i_formulation#668, i_color#669,
i_units#670, i_container#671, i_manager_id#672, i_product_name#673]

== Optimized Logical Plan ==
GlobalLimit 21
+- LocalLimit 21
   +- Sort [i_item_id#653 ASC NULLS FIRST, i_item_desc#656 ASC NULLS FIRST, s_store_id#624 ASC NULLS FIRST, s_store_name#628 ASC NULLS FIRST], true
      +- Aggregate [i_item_id#653, i_item_desc#656, s_store_id#624, s_store_name#628], [i_item_id#653, i_item_desc#656, s_store_id#624,
s_store_name#628, sum(cast(ss_net_profit#483 as double)) AS store_sales_profit#459, sum(cast(sr_net_loss#503 as double)) AS store_returns_loss#460,
sum(cast(cs_net_profit#537 as double)) AS catalog_sales_profit#461]
         +- Project [ss_net_profit#483, sr_net_loss#503, cs_net_profit#537, s_store_id#624, s_store_name#628, i_item_id#653, i_item_desc#656]
            +- Join Inner, (i_item_sk#652 = ss_item_sk#463)
               :- Project [ss_item_sk#463, ss_net_profit#483, sr_net_loss#503, cs_net_profit#537, s_store_id#624, s_store_name#628]
               :  +- Join Inner, (s_store_sk#623 = ss_store_sk#468)
               :     :- Project [ss_item_sk#463, ss_store_sk#468, ss_net_profit#483, sr_net_loss#503, cs_net_profit#537]
               :     :  +- Join Inner, (cs_sold_date_sk#538 = d_date_sk#595)
               :     :     :- Project [ss_item_sk#463, ss_store_sk#468, ss_net_profit#483, sr_net_loss#503, cs_net_profit#537, cs_sold_date_sk#538]
               :     :     :  +- Join Inner, (sr_returned_date_sk#504 = d_date_sk#567)
               :     :     :     :- Project [ss_item_sk#463, ss_store_sk#468, ss_net_profit#483, sr_net_loss#503, sr_returned_date_sk#504,
cs_net_profit#537, cs_sold_date_sk#538]
               :     :     :     :  +- Join Inner, (d_date_sk#539 = ss_sold_date_sk#484)
               :     :     :     :     :- Project [ss_item_sk#463, ss_store_sk#468, ss_net_profit#483, ss_sold_date_sk#484, sr_net_loss#503,
sr_returned_date_sk#504, cs_net_profit#537, cs_sold_date_sk#538]
               :     :     :     :     :  +- Join Inner, ((sr_customer_sk#487 = cs_bill_customer_sk#507) && (sr_item_sk#486 = cs_item_sk#519))
               :     :     :     :     :     :- Project [ss_item_sk#463, ss_store_sk#468, ss_net_profit#483, ss_sold_date_sk#484, sr_item_sk#486,
sr_customer_sk#487, sr_net_loss#503, sr_returned_date_sk#504]
               :     :     :     :     :     :  +- Join Inner, (((ss_customer_sk#464 = sr_customer_sk#487) && (ss_item_sk#463 = sr_item_sk#486)) &&
(ss_ticket_number#470L = sr_ticket_number#493L))
               :     :     :     :     :     :     :- Project [ss_item_sk#463, ss_customer_sk#464, ss_store_sk#468, ss_ticket_number#470L,
ss_net_profit#483, ss_sold_date_sk#484]
               :     :     :     :     :     :     :  +- Filter ((((isnotnull(ss_item_sk#463) && isnotnull(ss_customer_sk#464)) &&
isnotnull(ss_ticket_number#470L)) && isnotnull(ss_sold_date_sk#484)) && isnotnull(ss_store_sk#468))
               :     :     :     :     :     :     :     +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`store_sales`,
org.apache.hadoop.hive.ql.io.orc.OrcSerde, [ss_sold_time_sk#462, ss_item_sk#463, ss_customer_sk#464, ss_cdemo_sk#465, ss_hdemo_sk#466, ss_addr_sk#467,
ss_store_sk#468, ss_promo_sk#469, ss_ticket_number#470L, ss_quantity#471, ss_wholesale_cost#472, ss_list_price#473, ss_sales_price#474,
ss_ext_discount_amt#475, ss_ext_sales_price#476, ss_ext_wholesale_cost#477, ss_ext_list_price#478, ss_ext_tax#479, ss_coupon_amt#480, ss_net_paid#481,
ss_net_paid_inc_tax#482, ss_net_profit#483], [ss_sold_date_sk#484]
               :     :     :     :     :     :     +- Project [sr_item_sk#486, sr_customer_sk#487, sr_ticket_number#493L, sr_net_loss#503,
sr_returned_date_sk#504]
               :     :     :     :     :     :        +- Filter (((isnotnull(sr_item_sk#486) && isnotnull(sr_customer_sk#487)) &&
isnotnull(sr_ticket_number#493L)) && isnotnull(sr_returned_date_sk#504))
               :     :     :     :     :     :           +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`store_returns`,
org.apache.hadoop.hive.ql.io.orc.OrcSerde, [sr_return_time_sk#485, sr_item_sk#486, sr_customer_sk#487, sr_cdemo_sk#488, sr_hdemo_sk#489, sr_addr_sk#490,
sr_store_sk#491, sr_reason_sk#492, sr_ticket_number#493L, sr_return_quantity#494, sr_return_amt#495, sr_return_tax#496, sr_return_amt_inc_tax#497,
sr_fee#498, sr_return_ship_cost#499, sr_refunded_cash#500, sr_reversed_charge#501, sr_store_credit#502, sr_net_loss#503], [sr_returned_date_sk#504]
               :     :     :     :     :     +- Project [cs_bill_customer_sk#507, cs_item_sk#519, cs_net_profit#537, cs_sold_date_sk#538]
               :     :     :     :     :        +- Filter ((isnotnull(cs_item_sk#519) && isnotnull(cs_bill_customer_sk#507)) &&
isnotnull(cs_sold_date_sk#538))
               :     :     :     :     :           +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`catalog_sales`,
org.apache.hadoop.hive.ql.io.orc.OrcSerde, [cs_sold_time_sk#505, cs_ship_date_sk#506, cs_bill_customer_sk#507, cs_bill_cdemo_sk#508,
cs_bill_hdemo_sk#509, cs_bill_addr_sk#510, cs_ship_customer_sk#511, cs_ship_cdemo_sk#512, cs_ship_hdemo_sk#513, cs_ship_addr_sk#514,
cs_call_center_sk#515, cs_catalog_page_sk#516, cs_ship_mode_sk#517, cs_warehouse_sk#518, cs_item_sk#519, cs_promo_sk#520, cs_order_number#521L,
cs_quantity#522, cs_wholesale_cost#523, cs_list_price#524, cs_sales_price#525, cs_ext_discount_amt#526, cs_ext_sales_price#527,
cs_ext_wholesale_cost#528, ... 9 more fields], [cs_sold_date_sk#538]
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               :     :     :     :     +- Project [d_date_sk#539]
               :     :     :     :        +- Filter ((((isnotnull(d_moy#547) && isnotnull(d_year#545)) && (d_moy#547 = 4)) && (d_year#545 = 1998)) &&
isnotnull(d_date_sk#539))
               :     :     :     :           +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`date_dim`, org.apache.hadoop.hive.ql.io.orc.OrcSerde,
[d_date_sk#539, d_date_id#540, d_date#541, d_month_seq#542, d_week_seq#543, d_quarter_seq#544, d_year#545, d_dow#546, d_moy#547, d_dom#548, d_qoy#549,
d_fy_year#550, d_fy_quarter_seq#551, d_fy_week_seq#552, d_day_name#553, d_quarter_name#554, d_holiday#555, d_weekend#556, d_following_holiday#557,
d_first_dom#558, d_last_dom#559, d_same_day_ly#560, d_same_day_lq#561, d_current_day#562, ... 4 more fields]
               :     :     :     +- Project [d_date_sk#567]
               :     :     :        +- Filter (((((isnotnull(d_moy#575) && isnotnull(d_year#573)) && (d_moy#575 >= 4)) && (d_moy#575 <= 10)) &&
(d_year#573 = 1998)) && isnotnull(d_date_sk#567))
               :     :     :           +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`date_dim`, org.apache.hadoop.hive.ql.io.orc.OrcSerde,
[d_date_sk#567, d_date_id#568, d_date#569, d_month_seq#570, d_week_seq#571, d_quarter_seq#572, d_year#573, d_dow#574, d_moy#575, d_dom#576, d_qoy#577,
d_fy_year#578, d_fy_quarter_seq#579, d_fy_week_seq#580, d_day_name#581, d_quarter_name#582, d_holiday#583, d_weekend#584, d_following_holiday#585,
d_first_dom#586, d_last_dom#587, d_same_day_ly#588, d_same_day_lq#589, d_current_day#590, ... 4 more fields]
               :     :     +- Project [d_date_sk#595]
               :     :        +- Filter (((((isnotnull(d_moy#603) && isnotnull(d_year#601)) && (d_moy#603 >= 4)) && (d_moy#603 <= 10)) && (d_year#601 =
1998)) && isnotnull(d_date_sk#595))
               :     :           +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`date_dim`, org.apache.hadoop.hive.ql.io.orc.OrcSerde,
[d_date_sk#595, d_date_id#596, d_date#597, d_month_seq#598, d_week_seq#599, d_quarter_seq#600, d_year#601, d_dow#602, d_moy#603, d_dom#604, d_qoy#605,
d_fy_year#606, d_fy_quarter_seq#607, d_fy_week_seq#608, d_day_name#609, d_quarter_name#610, d_holiday#611, d_weekend#612, d_following_holiday#613,
d_first_dom#614, d_last_dom#615, d_same_day_ly#616, d_same_day_lq#617, d_current_day#618, ... 4 more fields]
               :     +- Project [s_store_sk#623, s_store_id#624, s_store_name#628]
               :        +- Filter isnotnull(s_store_sk#623)
               :           +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`store`, org.apache.hadoop.hive.ql.io.orc.OrcSerde, [s_store_sk#623,
s_store_id#624, s_rec_start_date#625, s_rec_end_date#626, s_closed_date_sk#627, s_store_name#628, s_number_employees#629, s_floor_space#630,
s_hours#631, s_manager#632, s_market_id#633, s_geography_class#634, s_market_desc#635, s_market_manager#636, s_division_id#637, s_division_name#638,
s_company_id#639, s_company_name#640, s_street_number#641, s_street_name#642, s_street_type#643, s_suite_number#644, s_city#645, s_county#646, ... 5
more fields]
               +- Project [i_item_sk#652, i_item_id#653, i_item_desc#656]
                  +- Filter isnotnull(i_item_sk#652)
                     +- CatalogRelation `tpcds_bin_partitioned_orc_50`.`item`, org.apache.hadoop.hive.ql.io.orc.OrcSerde, [i_item_sk#652, i_item_id#653,
i_rec_start_date#654, i_rec_end_date#655, i_item_desc#656, i_current_price#657, i_wholesale_cost#658, i_brand_id#659, i_brand#660, i_class_id#661,
i_class#662, i_category_id#663, i_category#664, i_manufact_id#665, i_manufact#666, i_size#667, i_formulation#668, i_color#669, i_units#670,
i_container#671, i_manager_id#672, i_product_name#673]

== Physical Plan ==
TakeOrderedAndProject(limit=21, orderBy=[i_item_id#653 ASC NULLS FIRST,i_item_desc#656 ASC NULLS FIRST,s_store_id#624 ASC NULLS FIRST,s_store_name#628
ASC NULLS FIRST], output=
[i_item_id#653,i_item_desc#656,s_store_id#624,s_store_name#628,store_sales_profit#459,store_returns_loss#460,catalog_sales_profit#461])
+- *HashAggregate(keys=[i_item_id#653, i_item_desc#656, s_store_id#624, s_store_name#628], functions=[sum(cast(ss_net_profit#483 as double)),
sum(cast(sr_net_loss#503 as double)), sum(cast(cs_net_profit#537 as double))], output=[i_item_id#653, i_item_desc#656, s_store_id#624, s_store_name#628,
store_sales_profit#459, store_returns_loss#460, catalog_sales_profit#461])
   +- Exchange hashpartitioning(i_item_id#653, i_item_desc#656, s_store_id#624, s_store_name#628, 200)
      +- *HashAggregate(keys=[i_item_id#653, i_item_desc#656, s_store_id#624, s_store_name#628], functions=[partial_sum(cast(ss_net_profit#483 as
double)), partial_sum(cast(sr_net_loss#503 as double)), partial_sum(cast(cs_net_profit#537 as double))], output=[i_item_id#653, i_item_desc#656,
s_store_id#624, s_store_name#628, sum#701, sum#702, sum#703])
         +- *Project [ss_net_profit#483, sr_net_loss#503, cs_net_profit#537, s_store_id#624, s_store_name#628, i_item_id#653, i_item_desc#656]
            +- *BroadcastHashJoin [ss_item_sk#463], [i_item_sk#652], Inner, BuildRight
               :- *Project [ss_item_sk#463, ss_net_profit#483, sr_net_loss#503, cs_net_profit#537, s_store_id#624, s_store_name#628]
               :  +- *BroadcastHashJoin [ss_store_sk#468], [s_store_sk#623], Inner, BuildRight
               :     :- *Project [ss_item_sk#463, ss_store_sk#468, ss_net_profit#483, sr_net_loss#503, cs_net_profit#537]
               :     :  +- *BroadcastHashJoin [cs_sold_date_sk#538], [d_date_sk#595], Inner, BuildRight
               :     :     :- *Project [ss_item_sk#463, ss_store_sk#468, ss_net_profit#483, sr_net_loss#503, cs_net_profit#537, cs_sold_date_sk#538]
               :     :     :  +- *BroadcastHashJoin [sr_returned_date_sk#504], [d_date_sk#567], Inner, BuildRight
               :     :     :     :- *Project [ss_item_sk#463, ss_store_sk#468, ss_net_profit#483, sr_net_loss#503, sr_returned_date_sk#504,
cs_net_profit#537, cs_sold_date_sk#538]
               :     :     :     :  +- *BroadcastHashJoin [ss_sold_date_sk#484], [d_date_sk#539], Inner, BuildRight
               :     :     :     :     :- *Project [ss_item_sk#463, ss_store_sk#468, ss_net_profit#483, ss_sold_date_sk#484, sr_net_loss#503,
sr_returned_date_sk#504, cs_net_profit#537, cs_sold_date_sk#538]
               :     :     :     :     :  +- *SortMergeJoin [sr_customer_sk#487, sr_item_sk#486], [cs_bill_customer_sk#507, cs_item_sk#519], Inner
               :     :     :     :     :     :- *Sort [sr_customer_sk#487 ASC NULLS FIRST, sr_item_sk#486 ASC NULLS FIRST], false, 0
               :     :     :     :     :     :  +- Exchange hashpartitioning(sr_customer_sk#487, sr_item_sk#486, 200)
               :     :     :     :     :     :     +- *Project [ss_item_sk#463, ss_store_sk#468, ss_net_profit#483, ss_sold_date_sk#484, sr_item_sk#486,
sr_customer_sk#487, sr_net_loss#503, sr_returned_date_sk#504]
               :     :     :     :     :     :        +- *SortMergeJoin [ss_customer_sk#464, ss_item_sk#463, ss_ticket_number#470L],
[sr_customer_sk#487, sr_item_sk#486, sr_ticket_number#493L], Inner
               :     :     :     :     :     :           :- *Sort [ss_customer_sk#464 ASC NULLS FIRST, ss_item_sk#463 ASC NULLS FIRST,
ss_ticket_number#470L ASC NULLS FIRST], false, 0
               :     :     :     :     :     :           :  +- Exchange hashpartitioning(ss_customer_sk#464, ss_item_sk#463, ss_ticket_number#470L, 200)
               :     :     :     :     :     :           :     +- *Filter (((isnotnull(ss_item_sk#463) && isnotnull(ss_customer_sk#464)) &&
isnotnull(ss_ticket_number#470L)) && isnotnull(ss_store_sk#468))
               :     :     :     :     :     :           :        +- HiveTableScan [ss_item_sk#463, ss_customer_sk#464, ss_store_sk#468,
ss_ticket_number#470L, ss_net_profit#483, ss_sold_date_sk#484], CatalogRelation `tpcds_bin_partitioned_orc_50`.`store_sales`,
org.apache.hadoop.hive.ql.io.orc.OrcSerde, [ss_sold_time_sk#462, ss_item_sk#463, ss_customer_sk#464, ss_cdemo_sk#465, ss_hdemo_sk#466, ss_addr_sk#467,
ss_store_sk#468, ss_promo_sk#469, ss_ticket_number#470L, ss_quantity#471, ss_wholesale_cost#472, ss_list_price#473, ss_sales_price#474,
ss_ext_discount_amt#475, ss_ext_sales_price#476, ss_ext_wholesale_cost#477, ss_ext_list_price#478, ss_ext_tax#479, ss_coupon_amt#480, ss_net_paid#481,
ss_net_paid_inc_tax#482, ss_net_profit#483], [ss_sold_date_sk#484], [isnotnull(ss_sold_date_sk#484)]
               :     :     :     :     :     :           +- *Sort [sr_customer_sk#487 ASC NULLS FIRST, sr_item_sk#486 ASC NULLS FIRST,
sr_ticket_number#493L ASC NULLS FIRST], false, 0
               :     :     :     :     :     :              +- Exchange hashpartitioning(sr_customer_sk#487, sr_item_sk#486, sr_ticket_number#493L, 200)
               :     :     :     :     :     :                 +- *Filter ((isnotnull(sr_item_sk#486) && isnotnull(sr_customer_sk#487)) &&
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isnotnull(sr_ticket_number#493L))
               :     :     :     :     :     :                    +- HiveTableScan [sr_item_sk#486, sr_customer_sk#487, sr_ticket_number#493L,
sr_net_loss#503, sr_returned_date_sk#504], CatalogRelation `tpcds_bin_partitioned_orc_50`.`store_returns`, org.apache.hadoop.hive.ql.io.orc.OrcSerde,
[sr_return_time_sk#485, sr_item_sk#486, sr_customer_sk#487, sr_cdemo_sk#488, sr_hdemo_sk#489, sr_addr_sk#490, sr_store_sk#491, sr_reason_sk#492,
sr_ticket_number#493L, sr_return_quantity#494, sr_return_amt#495, sr_return_tax#496, sr_return_amt_inc_tax#497, sr_fee#498, sr_return_ship_cost#499,
sr_refunded_cash#500, sr_reversed_charge#501, sr_store_credit#502, sr_net_loss#503], [sr_returned_date_sk#504], [isnotnull(sr_returned_date_sk#504)]
               :     :     :     :     :     +- *Sort [cs_bill_customer_sk#507 ASC NULLS FIRST, cs_item_sk#519 ASC NULLS FIRST], false, 0
               :     :     :     :     :        +- Exchange hashpartitioning(cs_bill_customer_sk#507, cs_item_sk#519, 200)
               :     :     :     :     :           +- *Filter (isnotnull(cs_item_sk#519) && isnotnull(cs_bill_customer_sk#507))
               :     :     :     :     :              +- HiveTableScan [cs_bill_customer_sk#507, cs_item_sk#519, cs_net_profit#537,
cs_sold_date_sk#538], CatalogRelation `tpcds_bin_partitioned_orc_50`.`catalog_sales`, org.apache.hadoop.hive.ql.io.orc.OrcSerde, [cs_sold_time_sk#505,
cs_ship_date_sk#506, cs_bill_customer_sk#507, cs_bill_cdemo_sk#508, cs_bill_hdemo_sk#509, cs_bill_addr_sk#510, cs_ship_customer_sk#511,
cs_ship_cdemo_sk#512, cs_ship_hdemo_sk#513, cs_ship_addr_sk#514, cs_call_center_sk#515, cs_catalog_page_sk#516, cs_ship_mode_sk#517,
cs_warehouse_sk#518, cs_item_sk#519, cs_promo_sk#520, cs_order_number#521L, cs_quantity#522, cs_wholesale_cost#523, cs_list_price#524,
cs_sales_price#525, cs_ext_discount_amt#526, cs_ext_sales_price#527, cs_ext_wholesale_cost#528, ... 9 more fields], [cs_sold_date_sk#538],
[isnotnull(cs_sold_date_sk#538)]
               :     :     :     :     +- BroadcastExchange HashedRelationBroadcastMode(List(cast(input[0, int, true] as bigint)))
               :     :     :     :        +- *Project [d_date_sk#539]
               :     :     :     :           +- *Filter ((((isnotnull(d_moy#547) && isnotnull(d_year#545)) && (d_moy#547 = 4)) && (d_year#545 = 1998))
&& isnotnull(d_date_sk#539))
               :     :     :     :              +- HiveTableScan [d_date_sk#539, d_moy#547, d_year#545], CatalogRelation
`tpcds_bin_partitioned_orc_50`.`date_dim`, org.apache.hadoop.hive.ql.io.orc.OrcSerde, [d_date_sk#539, d_date_id#540, d_date#541, d_month_seq#542,
d_week_seq#543, d_quarter_seq#544, d_year#545, d_dow#546, d_moy#547, d_dom#548, d_qoy#549, d_fy_year#550, d_fy_quarter_seq#551, d_fy_week_seq#552,
d_day_name#553, d_quarter_name#554, d_holiday#555, d_weekend#556, d_following_holiday#557, d_first_dom#558, d_last_dom#559, d_same_day_ly#560,
d_same_day_lq#561, d_current_day#562, ... 4 more fields]
               :     :     :     +- BroadcastExchange HashedRelationBroadcastMode(List(cast(input[0, int, true] as bigint)))
               :     :     :        +- *Project [d_date_sk#567]
               :     :     :           +- *Filter (((((isnotnull(d_moy#575) && isnotnull(d_year#573)) && (d_moy#575 >= 4)) && (d_moy#575 <= 10)) &&
(d_year#573 = 1998)) && isnotnull(d_date_sk#567))
               :     :     :              +- HiveTableScan [d_date_sk#567, d_moy#575, d_year#573], CatalogRelation
`tpcds_bin_partitioned_orc_50`.`date_dim`, org.apache.hadoop.hive.ql.io.orc.OrcSerde, [d_date_sk#567, d_date_id#568, d_date#569, d_month_seq#570,
d_week_seq#571, d_quarter_seq#572, d_year#573, d_dow#574, d_moy#575, d_dom#576, d_qoy#577, d_fy_year#578, d_fy_quarter_seq#579, d_fy_week_seq#580,
d_day_name#581, d_quarter_name#582, d_holiday#583, d_weekend#584, d_following_holiday#585, d_first_dom#586, d_last_dom#587, d_same_day_ly#588,
d_same_day_lq#589, d_current_day#590, ... 4 more fields]
               :     :     +- ReusedExchange [d_date_sk#595], BroadcastExchange HashedRelationBroadcastMode(List(cast(input[0, int, true] as bigint)))
               :     +- BroadcastExchange HashedRelationBroadcastMode(List(cast(input[0, int, false] as bigint)))
               :        +- *Filter isnotnull(s_store_sk#623)
               :           +- HiveTableScan [s_store_sk#623, s_store_id#624, s_store_name#628], CatalogRelation `tpcds_bin_partitioned_orc_50`.`store`,
org.apache.hadoop.hive.ql.io.orc.OrcSerde, [s_store_sk#623, s_store_id#624, s_rec_start_date#625, s_rec_end_date#626, s_closed_date_sk#627,
s_store_name#628, s_number_employees#629, s_floor_space#630, s_hours#631, s_manager#632, s_market_id#633, s_geography_class#634, s_market_desc#635,
s_market_manager#636, s_division_id#637, s_division_name#638, s_company_id#639, s_company_name#640, s_street_number#641, s_street_name#642,
s_street_type#643, s_suite_number#644, s_city#645, s_county#646, ... 5 more fields]
               +- BroadcastExchange HashedRelationBroadcastMode(List(cast(input[0, int, false] as bigint)))
                  +- *Filter isnotnull(i_item_sk#652)
                     +- HiveTableScan [i_item_sk#652, i_item_id#653, i_item_desc#656], CatalogRelation `tpcds_bin_partitioned_orc_50`.`item`,
org.apache.hadoop.hive.ql.io.orc.OrcSerde, [i_item_sk#652, i_item_id#653, i_rec_start_date#654, i_rec_end_date#655, i_item_desc#656,
i_current_price#657, i_wholesale_cost#658, i_brand_id#659, i_brand#660, i_class_id#661, i_class#662, i_category_id#663, i_category#664,
i_manufact_id#665, i_manufact#666, i_size#667, i_formulation#668, i_color#669, i_units#670, i_container#671, i_manager_id#672, i_product_name#673]
```