```
nodeID(34) FileScan parquet tpcds_100_parquet.inventory[inv_date_sk#38,inv_item_sk#39,inv_warehouse_sk#40,inv_quantity_on_hand#41]
nodeID(29) Filter (((((isnotnull(cs_quantity#22) AND isnotnull(inv_ate_sk#39)) AND isnotnull(inv
                                                                                                                    nodeID(28) Exchange hashpartitioning(cs_item_sk#19, 200), ENSURE_REQUIREMENTS, [plan_id=205]
                                                                                                                                                                                                                                                                                                                                         nodeID(32) Exchange hashpartitioning(inv_item_sk#39, 200), ENSURE_REQUIREMENTS, [plan_id=206]
                                                                                                                                                                               nodeID(27) Sort [cs_item_sk#19 ASC NULLS FIRST], false, 0 nodeID(31) Sort [inv_item_sk#39 ASC NULLS FIRST], false, 0
                                                                                                                                                                                                                                                                                                                                                                                                                                     nodeID(37) FileScan parquet tpcds_100_parquet.warehouse[w_warehouse_sk#42,w_warehouse_name#44]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         nodeID(36) Filter isnotnull(w_warehouse_sk#42)
                                                                                                                                                               nodeID(26) SortMergeJoin [cs_item_sk#19], [inv_item_sk#39], Inner, (inv_quantity_on_hand#41 < cs_quantity#22)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                nodeID(40) FileScan parquet tpcds_100_parquet.item[i_item_sk#56,i_item_desc#60]
                                                                                                                                        nodeID(24) BroadcastHashJoin [inv_warehouse_sk#40], [w_warehouse_sk#42], Inner, BuildRight, false
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            nodeID(39) Filter isnotnull(i_item_sk#56)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                nodeID(44) FileScan parquet tpcds_100_parquet.customer_demographics[cd_demo_sk#78,cd_marital_status#80]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       nodeID(43) Filter ((isnotnull(cd_marital_status#80) AND (cd_marital_status#80 = D)) AND isnotnull(cd_demo_sk#78))
                                                                                                                                                                                                                                                                                                                      nodeID(23) Project [cs_sold_date_sk#4, cs_ship_date_sk#6, cs_bill_cdemo_sk#8, cs_bill_hdemo_sk#9, cs_item_sk#19, cs_promo_sk#20, cs_order_number#21L, inv_date_sk#38, w_warehouse_name#44]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         nodeID(22) BroadcastHashJoin [cs_item_sk#19], [i_item_sk#56], Inner, BuildRight, false
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       nodeID(48) FileScan parquet tpcds_100_parquet.household_demographics[hd_demo_sk#87,hd_buy_potential#89]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     nodeID(21) Project [cs_sold_date_sk#4, cs_ship_date_sk#6, cs_bill_cdemo_sk#8, cs_bill_hdemo_sk#9, cs_item_sk#19, cs_promo_sk#20, cs_order_number#21L, inv_date_sk#38, w_warehouse_name#44, i_item_desc#60]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            nodeID(47) Filter ((isnotnull(hd_buy_potential#89) AND (hd_buy_potential#89 = >10000)) AND isnotnull(hd_demo_sk#87))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   nodeID(20) BroadcastHashJoin [cs_bill_cdemo_sk#8], [cd_demo_sk#78], Inner, BuildRight, false
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 nodeID(46) Project [hd_demo_sk#87]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     nodeID(52) FileScan parquet tpcds_100_parquet.date_dim[d_date_sk#92,d_date#94,d_week_seq#96,d_year#98]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              nodeID(19) Project [cs_sold_date_sk#4, cs_ship_date_sk#4, cs_ship_date_sk#4, cs_ship_date_sk#38, w_warehouse_name#44, i_item_desc#60] nodeID(51) Filter ((((isnotnull(d_year#98)AND (d_year#98 = 1999))AND isnotnull(d_year#98)AND (d_year#98 = 1999)) AND isnotnull(d_date_sk#38, w_warehouse_name#44, i_item_desc#60]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        nodeID(18) BroadcastHashJoin [cs_bill_hdemo_sk#9], [hd_demo_sk#87], Inner, BuildRight, false
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       nodeID(50) Project [d_date_sk#92, d_date#94, d_week_seq#96]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              nodeID(55) FileScan parquet tpcds_100_parquet.date_dim[d_date_sk#166,d_week_seq#170]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        nodeID(17) Project [cs_sold_date_sk#4, cs_ship_date_sk#6, cs_item_sk#19, cs_promo_sk#20, cs_order_number#21L, inv_date_sk#38, w_warehouse_name#44, i_item_desc#60] — nodeID(49) BroadcastExchange HashedRelationBroadcastMode(List(cast(input[0, int, true] as bigint)), false), [plan_id=228]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          nodeID(54) Filter (isnotnull(d_week_seq#170) AND isnotnull(d_date_sk#166))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   nodeID(16) BroadcastHashJoin [cs_sold_date_sk#4], [d_date_sk#92], Inner, BuildRight, false
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          nodeID(53) BroadcastExchange HashedRelationBroadcastMode(List((shiftleft(cast(input[1, int, false] as bigint), 32) | (cast(input[0, int, false] as bigint), 
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    nodeID(57) Filter (isnotnull(d_date#196) AND isnotnull(d_date_sk#194))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             nodeID(14) BroadcastHashJoin [d_week_seq#96, inv_date_sk#38], [d_week_seq#170, d_date_sk#166], Inner, BuildRight, false
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           nodeID(61) FileScan parquet tpcds_100_parquet.promotion[p_promo_sk#120]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  nodeID(13) Project [cs_ship_date_sk#6, cs_item_sk#19, cs_promo_sk#20, cs_order_number#21L, w_warehouse_name#44, i_item_desc#60, d_date#94, d_week_seq#96]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              nodeID(12) BroadcastHashJoin [cs_ship_date_sk#6], [d_date_sk#194], Inner, BuildRight, (cast(d_date#196 as date) > date_add(cast(d_date#94 as date), 5)), false
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     nodeID(60) Filter isnotnull(p_promo_sk#120)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             nodeID(11) Project [cs_item_sk#19, cs_promo_sk#20, cs_order_number#21L, w_warehouse_name#44, i_item_desc#60, d_week_seq#96] nodeID(59) BroadcastExchange HashedRelationBroadcastMode(List(cast(input[0, int, false] as bigint)), false), [plan_id=240]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   nodeID(10) BroadcastHashJoin [cs_promo_sk#20], [p_promo_sk#120], LeftOuter, BuildRight, false
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   nodeID(65) FileScan parquet tpcds_100_parquet.catalog_returns[cr_item_sk#141,cr_order_number#155L]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               nodeID(64) Filter (isnotnull(cr_item_sk#141) AND isnotnull(cr_order_number#155L))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       nodeID(9) Project [cs_item_sk#19, cs_order_number#21L, w_warehouse_name#44, i_item_desc#60, d_week_seq#96, p_promo_sk#120]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              nodeID(8) Exchange hashpartitioning(cs_item_sk#19, cs_order_number#21L, 200), ENSURE_REQUIREMENTS, [plan_id=245]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              nodeID(7) Sort [cs_item_sk#19 ASC NULLS FIRST, cs_order_number#21L ASC NULLS FIRST], false, 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                nodeID(6) SortMergeJoin [cs_item_sk#19, cs_order_number#21L], [cr_item_sk#141, cr_order_number#155L], LeftOuter
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 nodeID(5) Project [w_warehouse_name#44, i_item_desc#60, d_week_seq#96, p_promo_sk#120]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        nodeID(4) HashAggregate(keys=[i_item_desc#60, w_warehouse_name#44, d_week_seq#96], functions=[partial_sum(CASE WHEN isnull(p_promo_sk#120) THEN 1 ELSE 0 END), partial_sum(CASE WHEN isnotnull(p_promo_sk#120) THE
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    nodeID(3) Exchange hashpartitioning(i_item_desc#60, w_warehouse_name#44, d_week_seq#96, 200), ENSURE_REQUIREMENTS, [plan_id=253]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          nodeID(2) HashAggregate(keys=[i_item_desc#60, w_warehouse_name#44, d_week_seq#96], functions=[sum(CASE WHEN isnull(p_promo_sk#120) THEN 1 ELSE 0 END), sum(CASE WHEN isnotnull(p_promo_sk#120) THEN 1 ELSE 0 END), sum(CASE WHEN isnotnull(p_promo_sk#
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            nodeID(1) TakeOrderedAndProject(limit=100, orderBy=[total_cnt#2L DESC NULLS FIRST,w_warehouse_name#44,d_week_seq#96,no_promo#0L,promo#1L,total_cnt#2L])
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nodeID(30) FileScan parquet tpcds_100_parquet.catalog_sales[cs_sold_date_sk#4,cs_ship_date_sk#6,cs_bill_cdemo_sk#8,cs_bill_hdemo_sk#9,cs_item_sk#19,cs_promo_sk#20,cs_order_number#21L,cs_quantity#22]