```
nodeID(23) FileScan parquet tpcds_500_parquet.store_sales[ss_sold_date_sk#3,ss_item_sk#5,ss_customer_sk#6,ss_store_sk#10,ss_ticket_number#12L,ss_quantity#13
                                                                                                                                                                                                                                                                                nodeID(27) FileScan parquet tpcds_500_parquet.store_returns[sr_returned_date_sk#26,sr_item_sk#28,sr_customer_sk#29,sr_ticket_number#35L,sr_return_quantity#36
nodeID(22) Filter ((((isnotnull(ss_customer_sk#6) AND isnotnull(ss_item_sk#5)) AND isnotnull(ss_ticket_number#12L)) AND isnotnull(ss_sold_date_sk#3)) AND isnotnull(ss_store_sk#10))
                                                                                                                                                                                                                                                                                 nodeID(26) Filter (((isnotnull(sr_customer_sk#29) AND isnotnull(sr_item_sk#28)) AND isnotnull(sr_ticket_number#35L)) AND isnotnull(sr_returned_date_sk#26))
                                        nodeID(21) Exchange hashpartitioning(ss_customer_sk#6, ss_item_sk#5, ss_ticket_number#12L, 200), ENSURE_REQUIREMENTS, [plan_id=151]
                                                                                                                                                                                                                                                                               nodeID(25) Exchange hashpartitioning(sr_customer_sk#29, sr_item_sk#28, sr_ticket_number#35L, 200), ENSURE_REQUIREMENTS, [plan_id=152]
                                         nodeID(20) Sort [ss_customer_sk#6 ASC NULLS FIRST, ss_item_sk#5 ASC NULLS FIRST, ss_ticket_number#12L ASC NULLS FIRST], false, 0
                                                                                                                                                                                                                                                                         nodeID(24) Sort [sr_customer_sk#29 ASC NULLS FIRST, sr_item_sk#28 ASC NULLS FIRST, sr_ticket_number#35L ASC NULLS FIRST], false, 0
                                                                                                                                                                                                                                                                                                                                                                                    nodeID(31) FileScan parquet tpcds_500_parquet.catalog_sales[cs_sold_date_sk#46,cs_bill_customer_sk#49,cs_item_sk#61,cs_quantity#64
                                                                                                                                                     nodeID(19) SortMergeJoin [ss_customer_sk#6, ss_item_sk#5, ss_ticket_number#12L], [sr_customer_sk#29, sr_item_sk#28, sr_ticket_number#35L], Inner
                                                                                                                                           nodeID(18) Project [ss_sold_date_sk#3, ss_item_sk#49) AND isnotnull(cs_item_sk#26, sr_item_sk#26, sr_item_sk#26, sr_item_sk#26, sr_item_sk#26) and isnotnull(cs_item_sk#26, sr_item_sk#26, sr_item_sk#26) and isnotnull(cs_item_sk#26, sr_item_sk#26, sr_item_sk#26) and isnotnull(cs_item_sk#26, sr_item_sk#26, sr_item_sk#2
                                                                                                                                                                                                                                                                                                                                                                                    nodeID(29) Exchange hashpartitioning(cs_bill_customer_sk#49, cs_item_sk#61, 200), ENSURE_REQUIREMENTS, [plan_id=160]
                                                                                                                                                                                nodeID(17) Exchange hashpartitioning(sr_customer_sk#29, sr_item_sk#28, 200), ENSURE_REQUIREMENTS, [plan_id=159]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                nodeID(35) FileScan parquet tpcds_500_parquet.date_dim[d_date_sk#80,d_year#86,d_moy#88
                                                                                                                                                                                                   nodeID(16) Sort [sr_customer_sk#29 ASC NULLS FIRST, sr_item_sk#28 ASC NULLS FIRST], false, 0
                                                                                                                                                                                                                                                                                                                                                                             nodeID(28) Sort [cs_bill_customer_sk#49 ASC NULLS FIRST, cs_item_sk#61 ASC NULLS FIRST], false, 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               nodeID(34) Filter ((((isnotnull(d_moy#88) AND isnotnull(d_year#86)) AND (d_moy#88 = 9)) AND (d_year#86 = 1999)) AND isnotnull(d_date_sk#80))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        nodeID(39) FileScan parquet tpcds_500_parquet.date_dim[d_date_sk#159,d_year#165,d_moy#167
                                                                                                                                                                                                                                                                                                                                                          nodeID(15) SortMergeJoin [sr_customer_sk#29, sr_item_sk#28], [cs_bill_customer_sk#49, cs_item_sk#61], Inner
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              nodeID(33) Project [d_date_sk#80]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               nodeID(32) BroadcastExchange HashedRelationBroadcastMode(List(cast(input[0, int, true] as bigint)),false), [plan_id=166]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   nodeID(38) Filter (((((isnotnull(d_moy#167) AND isnotnull(d_year#165)) AND (d_moy#167 >= 9)) AND (d_moy#167 <= 12)) AND (d_year#165 = 1999)) AND isnotnull(d_date_sk#159))
                                                                                                                                                                                                                                                                                                                           nodeID(14) Project [ss_sold_date_sk#3, ss_item_sk#5, ss_store_sk#10, ss_quantity#13, sr_returned_date_sk#26, sr_return_quantity#36, cs_sold_date_sk#46, cs_quantity#64]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        nodeID(13) BroadcastHashJoin [ss_sold_date_sk#3], [d_date_sk#80], Inner, BuildRight, false
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 nodeID(43) FileScan parquet tpcds_500_parquet.date_dim[d_date_sk#187,d_year#193
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  nodeID(37) Project [d_date_sk#159]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 nodeID(42) Filter (d_year#193 IN (1999,2000,2001) AND isnotnull(d_date_sk#187))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              nodeID(12) Project [ss_item_sk#5, ss_store_sk#10, ss_quantity#13, sr_returned_date_sk#26, sr_return_quantity#36, cs_sold_date_sk#46, cs_quantity#64]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                nodeID(36) BroadcastExchange HashedRelationBroadcastMode(List(cast(input[0, int, true] as bigint)), false), [plan_id=170]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         nodeID(41) Project [d_date_sk#187]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           nodeID(11) BroadcastHashJoin [sr_returned_date_sk#26], [d_date_sk#159], Inner, BuildRight, false
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       nodeID(10) Project [ss_item_sk#5, ss_store_sk#10, ss_quantity#13, sr_return_quantity#36, cs_sold_date_sk#46, cs_quantity#64]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       nodeID(40) BroadcastExchange HashedRelationBroadcastMode(List(cast(input[0, int, true] as bigint)),false), [plan_id=174] nodeID(46) FileScan parquet tpcds_500_parquet.store[s_store_sk#108,s_store_id#109,s_store_name#113
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           nodeID(9) BroadcastHashJoin [cs_sold_date_sk#46], [d_date_sk#187], Inner, BuildRight, false
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               nodeID(45) Filter isnotnull(s_store_sk#108)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     nodeID(44) BroadcastExchange HashedRelationBroadcastMode(List(cast(input[0, int, false] as bigint)), false), [plan_id=178]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  nodeID(49) FileScan parquet tpcds_500_parquet.item[i_item_sk#137,i_item_id#138,i_item_desc#141
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  nodeID(8) Project [ss_item_sk#5, ss_store_sk#10, ss_quantity#13, sr_return_quantity#36, cs_quantity#64]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               nodeID(7) BroadcastHashJoin [ss_store_sk#10], [s_store_sk#108], Inner, BuildRight, false
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 nodeID(48) Filter isnotnull(i_item_sk#137)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       nodeID(47) BroadcastExchange HashedRelationBroadcastMode(List(cast(input[0, int, false] as bigint)),false), [plan_id=182]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              nodeID(6) Project [ss_item_sk#5, ss_quantity#13, sr_return_quantity#36, cs_quantity#64, s_store_id#109, s_store_name#113]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             nodeID(5) BroadcastHashJoin [ss_item_sk#5], [i_item_sk#137], Inner, BuildRight, false
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              nodeID(4) Project [ss_quantity#13, sr_return_quantity#36, cs_quantity#64, s_store_id#109, s_store_name#113, i_item_id#138, i_item_desc#141]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           nodeID(3) HashAggregate(keys=[i_item_id#138, i_item_desc#141, s_store_id#109, s_store_name#113], functions=[partial_sum(ss_quantity#13), partial_sum(sr_return_quantity#36), partial_sum(cs_quantity#64)])
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      nodeID(2) Exchange hashpartitioning(i_item_id#138, i_item_desc#141, s_store_id#109, s_store_name#113, 200), ENSURE_REQUIREMENTS, [plan_id=187]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       nodeID(1) HashAggregate(keys=[i_item_id#138, i_item_desc#141, s_store_id#109, s_store_name#113], functions=[sum(ss_quantity#13), sum(sr_return_quantity#36), sum(cs_quantity#64)])
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