```
nodeID(24) FileScan parquet tpcds_100_parquet.store_sales[ss_sold_date_sk#12,ss_item_sk#14,ss_customer_sk#15,ss_store_sk#19,ss_ticket_number#21L,ss_quantity#22]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    nodeID(28) FileScan parquet tpcds_100_parquet.store_returns[sr_returned_date_sk#35,sr_item_sk#37,sr_customer_sk#38,sr_ticket_number#44L,sr_return_quantity#45]
nodeID(23) Filter ((((isnotnull(sr_customer_sk#37)) AND isnotnull(sr_item_sk#37)) AND isnotnull(
                                                                                   nodeID(22) Exchange hashpartitioning(ss_customer_sk#15, ss_item_sk#14, ss_ticket_number#21L, 200), ENSURE_REQUIREMENTS, [plan_id=151]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       nodeID(26) Exchange hashpartitioning(sr_customer_sk#38, sr_item_sk#37, sr_ticket_number#44L, 200), ENSURE_REQUIREMENTS, [plan_id=152]
                                                                                   nodeID(21) Sort [ss_customer_sk#15 ASC NULLS FIRST, ss_item_sk#14 ASC NULLS FIRST, ss_ticket_number#21L ASC NULLS FIRST], false, 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              nodeID(25) Sort [sr_customer_sk#38 ASC NULLS FIRST, sr_item_sk#37 ASC NULLS FIRST, sr_ticket_number#44L ASC NULLS FIRST], false, 0
                                                                                                                                                                                                                                                                                                          nodeID(20) SortMergeJoin [ss_customer_sk#15, ss_item_sk#14, ss_item_sk#37, sr_item_sk#37, sr_item_sk#37, sr_item_sk#37, sr_item_sk#37, sr_item_sk#38, sr_ite
                                                                                                                                                                                                                                                                                         nodeID(19) Project [ss_sold_date_sk#12, ss_item_sk#14, ss_store_sk#19, ss_quantity#22, sr_returned_date_sk#35, sr_item_sk#37, sr_customer_sk#38, sr_return_quantity#45]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                nodeID(31) Filter ((isnotnull(cs_bill_customer_sk#58) AND isnotnull(cs_item_sk#70)) AND isnotnull(cs_sold_date_sk#55))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 nodeID(30) Exchange hashpartitioning(cs_bill_customer_sk#58, cs_item_sk#70, 200), ENSURE_REQUIREMENTS, [plan_id=160]
                                                                                                                                                                                                                                                                                                                                                                       nodeID(18) Exchange hashpartitioning(sr_customer_sk#38, sr_item_sk#37, 200), ENSURE_REQUIREMENTS, [plan_id=159]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  nodeID(36) FileScan parquet tpcds_100_parquet.date_dim[d_date_sk#89,d_quarter_name#104]
                                                                                                                                                                                                                                                                                                                                                                                                             nodeID(17) Sort [sr_customer_sk#38 ASC NULLS FIRST, sr_item_sk#37 ASC NULLS FIRST], false, 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         nodeID(29) Sort [cs_bill_customer_sk#58 ASC NULLS FIRST, cs_item_sk#70 ASC NULLS FIRST], false, 0
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       nodeID(35) Filter ((isnotnull(d_quarter_name#104) AND (d_quarter_name#104 = 2001Q1)) AND isnotnull(d_date_sk#89))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 nodeID(16) SortMergeJoin [sr_customer_sk#38, sr_item_sk#37], [cs_bill_customer_sk#58, cs_item_sk#70], Inner
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              nodeID(40) FileScan parquet tpcds_100_parquet.date_dim[d_date_sk#168,d_quarter_name#183]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         nodeID(34) Project [d_date_sk#89]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      nodeID(15) Project [ss_sold_date_sk#12, ss_item_sk#14, ss_store_sk#19, ss_quantity#22, sr_return_quantity#25, cs_sold_date_sk#35, sr_return_quantity#45, c
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     nodeID(39) Filter (d_quarter_name#183 IN (2001Q1,2001Q2,2001Q3) AND isnotnull(d_date_sk#168))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     nodeID(14) BroadcastHashJoin [ss_sold_date_sk#12], [d_date_sk#89], Inner, BuildRight, false
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                nodeID(44) FileScan parquet tpcds_100_parquet.date_dim[d_date_sk#196,d_quarter_name#211]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 nodeID(38) Project [d_date_sk#168]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        nodeID(13) Project [ss_item_sk#14, ss_store_sk#19, ss_quantity#22, sr_return_quantity#45, cs_sold_date_sk#35, s
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        nodeID(43) Filter (d_quarter_name#211 IN (2001Q1,2001Q2,2001Q3) AND isnotnull(d_date_sk#196))
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         nodeID(12) BroadcastHashJoin [sr_returned_date_sk#35], [d_date_sk#168], Inner, BuildRight, false
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     nodeID(42) Project [d_date_sk#196]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        nodeID(11) Project [ss_item_sk#14, ss_store_sk#19, ss_quantity#22, sr_return_quantity#45, cs_sold_date_sk#55, cs_quantity#73] nodeID(41) BroadcastExchange HashedRelationBroadcastMode(List(cast(input[0, int, true] as bigint)), false), [plan_id=174]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            nodeID(47) FileScan parquet tpcds_100_parquet.store[s_store_sk#117,s_state#141]
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    nodeID(46) Filter isnotnull(s_store_sk#117)
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           nodeID(10) BroadcastHashJoin [cs_sold_date_sk#55], [d_date_sk#196], Inner, BuildRight, false
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         nodeID(9) Project [ss_item_sk#14, ss_store_sk#19, ss_quantity#22, sr_return_quantity#45, cs_quantity#73] nodeID(45) BroadcastExchange HashedRelationBroadcastMode(List(cast(input[0, int, false] as bigint)),false), [plan_id=178]
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            nodeID(8) BroadcastHashJoin [ss_store_sk#19], [s_store_sk#117], Inner, BuildRight, false
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               nodeID(3) Exchange hashpartitioning(i_item_id#147, i_item_desc#150, s_state#141, 200), ENSURE_REQUIREMENTS, [plan_id=187]
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   nodeID(1) TakeOrderedAndProject(limit=100, orderBy=[i_item_id#147 ASC NULLS FIRST,i_item_desc#150,s_state#141 ASC NULLS FIRST], output=[i_item_id#147,i_item_desc#150,s_state#141 ASC NULLS FIRST,i_item_desc#150,s_state#141,store_sales_quantitycount#4L,as_store_returns_quantitycount#4L,as_store_returns_quantitycount#4L,as_store_returns_quantitycount#4L,as_store_returns_quantitycount#4L,as_store_returns_quantitycount#4L,as_store_returns_quantitycount#4L,as_store_returns_quantitycount#4L,as_store_returns_quantitycount#4L,as_store_returns_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sales_quantitycount#6L,store_sale
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