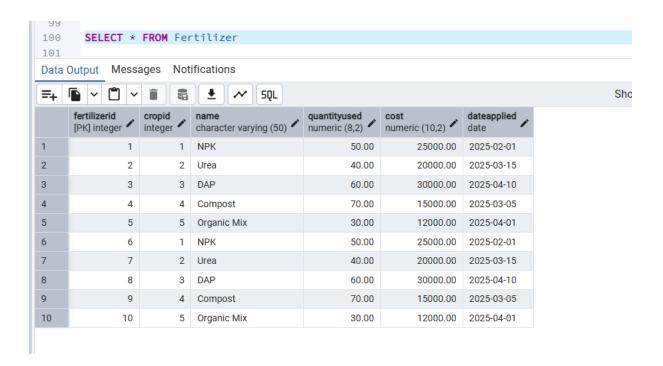
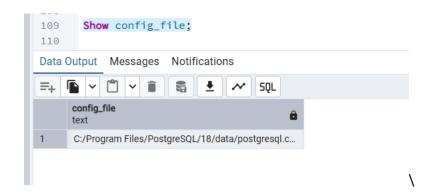
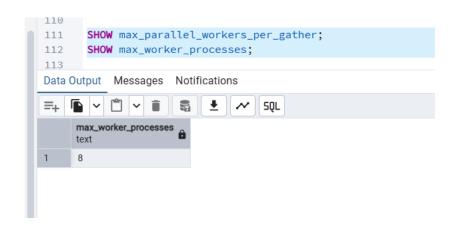
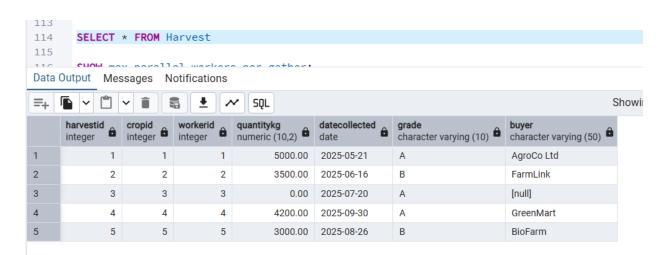
```
97
93
       SELECT c.CropName, SUM(h.QuantityKG) FROM Crop c
 94
95
       INNER JOIN Harvest h
       ON c.CropID = h.CropID
96
       GROUP BY 1
97
98
99
      SELECT * FROM Fertilizer
100
101
      SET max_parallel_workers_per_gather = 0;
102
103
104
      -- Enable more parallel workers to improve parallel speed
105
       SET max_parallel_workers_per_gather = 2;
106 SFT may parallel workers = 8.
Data Output Messages Notifications
5QL
     cropname
     character varying (50) numeric
1
     Beans
                         3500.00
2
     Cassava
                         4200.00
3
     Maize
                         5000.00
4
                           0.00
     Rice
5
     Soybean
                         3000.00
```







```
88
89
      IMPORT FOREIGN SCHEMA public
90
      LIMIT TO (Worker, Harvest, Sale)
      FROM SERVER BRANCH_B_server INTO public;
91
92
93
      SELECT c.CropName, SUM(h.QuantityKG) FROM Crop c
94
      INNER JOIN Harvest h
95
96
      ON c.CropID = h.CropID
97
      GROUP BY 1
98
99
      SELECT * FROM Fertilizer
100
101
102
      SET max_parallel_workers_per_gather = 0;
103
104
      -- Enable more parallel workers to improve parallel speed
105
      SET max_parallel_workers_per_gather = 2;
106
      SET max_parallel_workers = 8;
107
      SET max_worker_processes = 8;
108
109
      Show config_file;
110
      SHOW max_parallel_workers_per_gather;
111
      SHOW max_worker_processes;
112
113
114
      SELECT * FROM Harvest
115
116
      SHOW max_parallel_workers_per_gather;
117
118
      EXPLAIN ANALYZE
119
      SELECT c.cropname, SUM(h.quantitykg) AS total_harvest
120
      FROM crop c
121
      JOIN harvest h ON c.cropid = h.cropid
122 GROUP BY c.cropname:
```



```
118 EXPLAIN ANALYZE
119 SELECT c.cropname, SUM(h.quantitykg) AS total_harvest
120 FROM crop c
121    JOIN harvest h ON c.cropid = h.cropid
122 GROUP BY c.cropname;
Data Output Messages Notifications
    $ ± ~ SQL
      QUERY PLAN
      GroupAggregate (cost=527.17..527.66 rows=6 width=150) (actual time=1.189..1.196 rows=5.00 loops=1)
2
       Group Key: c.cropname
3
       Buffers: shared hit=1
4
       -> Sort (cost=527.17..527.31 rows=56 width=134) (actual time=1.179..1.181 rows=5.00 loops=1)
5
          Sort Key: c.cropname
6
          Sort Method: quicksort Memory: 25kB
          Buffers: shared hit=1
7
8
          -> Hash Join (cost=101.14..525.54 rows=56 width=134) (actual time=1.150..1.155 rows=5.00 loops=1)
9
            Hash Cond: (h.cropid = c.cropid)
```

-> Foreign Scan on harvest h (cost=100.00..519.42 rows=1861 width=20) (actual time=1.074..1.076 rows=5.00 loo...

-> Seq Scan on crop c (cost=0.00..1.06 rows=6 width=122) (actual time=0.040..0.043 rows=11.00 loops=1)

-> Hash (cost=1.06..1.06 rows=6 width=122) (actual time=0.053..0.053 rows=11.00 loops=1)

Buffers: shared hit=1

Buffers: shared hit=1

Planning Time: 0.255 ms Execution Time: 2.156 ms

Buckets: 1024 Batches: 1 Memory Usage: 9kB

10

11 12

13 14

15 16 17

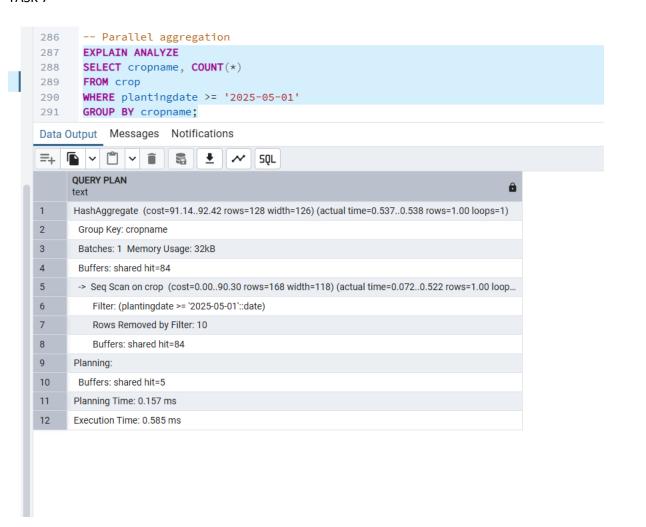
18

```
124 --- Force pararell excecution
      EXPLAIN ANALYZE
125
        SELECT /*+ Parallel */ c.cropname, SUM(h.quantitykg) AS total_harvest
126
127
        FROM crop c
128
        JOIN harvest h ON c.cropid = h.cropid
129 GROUP BY c.cropname;
130
Data Output Messages Notifications
                                       ~ | 5QL
                                                                                                                     Sho
      QUERY PLAN
      text
1
      GroupAggregate (cost=527.17..527.66 rows=6 width=150) (actual time=1.113..1.119 rows=5.00 loops=1)
       Group Key: c.cropname
3
       Buffers: shared hit=1
4
       -> Sort (cost=527.17..527.31 rows=56 width=134) (actual time=1.102..1.104 rows=5.00 loops=1)
5
          Sort Key: c.cropname
          Sort Method: quicksort Memory: 25kB
6
7
          Buffers: shared hit=1
8
          -> Hash Join (cost=101.14..525.54 rows=56 width=134) (actual time=1.077..1.081 rows=5.00 loops=1)
9
             Hash Cond: (h.cropid = c.cropid)
             Buffers: shared hit=1
10
             -> Foreign Scan on harvest h (cost=100.00..519.42 rows=1861 width=20) (actual time=1.020..1.021 rows=5.00 loo...
11
12
             -> Hash (cost=1.06..1.06 rows=6 width=122) (actual time=0.046..0.047 rows=11.00 loops=1)
13
                Buckets: 1024 Batches: 1 Memory Usage: 9kB
14
                Buffers: shared hit=1
                -> Seq Scan on crop c (cost=0.00..1.06 rows=6 width=122) (actual time=0.038..0.040 rows=11.00 loops=1)
15
16
                   Buffers: shared hit=1
17
      Planning Time: 0.192 ms
      Execution Time: 2.149 ms
18
```

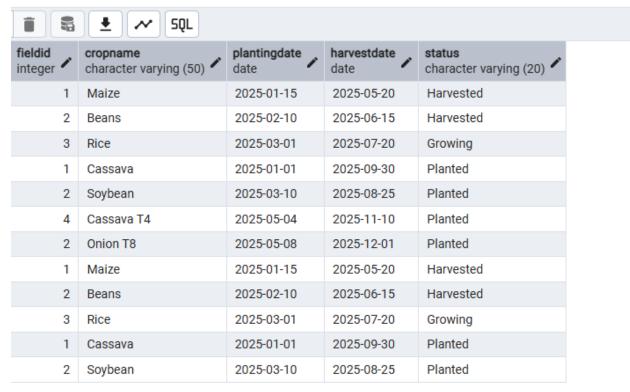
```
134 --- TASK 4
135
136
      --- Begin the distributed transaction
137
138
      BEGIN:
139
      ---Operation in BRANCH A
140
      INSERT INTO crop (fieldid, cropname, plantingdate, status, harvestdate)
141
      VALUES (1, 'Tomato', '2025-05-01', 'Planted', '2025-10-27');
142
143
144
      ---Operation in BRANCH B
145
146
      INSERT INTO worker (fullname, role, contact, dailywage)
      VALUES ('Peter Mugabo', 'Harvester', '0788000006', 3000);
147
148
149
      ---Prepare the Transaction for 2PC
150
      PREPARE TRANSACTION 'tx_insert_farm';
151
152
      ---Verify Pending Distributed Transaction
153
      SELECT * FROM pg_prepared_xacts;
154
155
156
157
158
      INSERT INTO crop (fieldid, cropname, plantingdate, status, harvestdate)
      VALUES (1, 'Tomato T1', '2025-05-01', 'Planted', '2025-10-27');
159
      INSERT INTO worker (fullname, role, contact, dailywage)
160
      VALUES ('1', 'Harvester', '0788000101', 3000);
161
      PREPARE TRANSACTION 'tx_farm_1';
162
163
164
      BEGIN;
      INSERT INTO crop (fieldid, cropname, plantingdate, status, harvestdate)
      VALUES (2 'Reans T2' '2025-05-02' 'Planted' '2025-10-28').
Data Output Messages Notifications
=+ □ ∨ □ ∨
                     SA
                        database
     transaction a gid text a prepared timestamp with time zone a owner name a databa
```



TASK 7



ages Notifications



TASK 8

