

## Without Index

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2

```
Seq Scan on agenda_has_equipment (cost=0.00..142.14 rows=3 width=20) (actual time=0.000..0.000
rows=4 loops=1)
  Filter: (equipment_id = 9)
  Total runtime: 0.000 ms
(3 linhas)
```

3

```
Seq Scan on client_rents_equipment (cost=0.00..86.16 rows=2 width=49) (actual time=0.000..0.000
rows=1 loops=1)
  Filter: (equipment_id = 9)
  Total runtime: 0.000 ms
(3 linhas)
```

4

```
Hash Join (cost=383.29..466.95 rows=591 width=30) (actual time=16.000..20.000 rows=602 loops=1)
  Hash Cond: ((b.login)::text = (bhm.band_login)::text)
    -> Seq Scan on band b (cost=0.00..62.50 rows=3050 width=20) (actual time=0.000..4.000 rows=3050
loops=1)
    -> Hash (cost=375.90..375.90 rows=591 width=30) (actual time=16.000..16.000 rows=602 loops=1)
      -> Hash Join (cost=297.51..375.90 rows=591 width=30) (actual time=8.000..12.000 rows=602
loops=1)
        Hash Cond: (bhm.member_id = m.member_id)
        -> Seq Scan on band_has_member bhm (cost=0.00..58.44 rows=3744 width=14) (actual
time=0.000..4.000 rows=3744 loops=1)
        -> Hash (cost=290.13..290.13 rows=591 width=24) (actual time=8.000..8.000 rows=602
loops=1)
          -> Hash Join (cost=211.75..290.13 rows=591 width=24) (actual time=0.000..8.000
rows=602 loops=1)
            Hash Cond: ((m.person_cpf)::text = (p.cpf)::text)
            -> Seq Scan on member m (cost=0.00..58.44 rows=3744 width=14) (actual
time=0.000..4.000 rows=3744 loops=1)
            -> Hash (cost=196.98..196.98 rows=1181 width=30) (actual
time=0.000..0.000 rows=1181 loops=1)
              -> Bitmap Heap Scan on person p (cost=50.36..196.98 rows=1181
width=30) (actual time=0.000..0.000 rows=1181 loops=1)
                Recheck Cond: (age < 25)
                Filter: ((gender)::text = 'male'::text)
                -> Bitmap Index Scan on person_age_index (cost=0.00..50.06
rows=2375 width=0) (actual time=0.000..0.000 rows=2362 loops=1)
                    Index Cond: (age < 25)
            Total runtime: 20.000 ms
```

## With Index

=====

2

```
Bitmap Heap Scan on agenda_has_equipment (cost=4.27..14.06 rows=3 width=20) (actual
time=0.000..0.000 rows=4 loops=1)
  Recheck Cond: (equipment_id = 9)
  -> Bitmap Index Scan on equipment_agenda_index (cost=0.00..4.27 rows=3 width=0) (actual
time=0.000..0.000 rows=4 loops=1)
    Index Cond: (equipment_id = 9)
  Total runtime: 0.000 ms
(5 linhas)
```

3

```
Bitmap Heap Scan on client_rents_equipment (cost=4.27..10.95 rows=2 width=49) (actual
time=0.000..0.000 rows=1 loops=1)
  Recheck Cond: (equipment_id = 9)
  -> Bitmap Index Scan on equipment_client_index (cost=0.00..4.27 rows=2 width=0) (actual
time=0.000..0.000 rows=1 loops=1)
    Index Cond: (equipment_id = 9)
  Total runtime: 0.000 ms
(5 linhas)
```

4

```
Hash Join (cost=383.29..466.95 rows=591 width=30) (actual time=16.000..24.000 rows=602 loops=1)
  Hash Cond: ((b.login)::text = (bhm.band_login)::text)
    -> Seq Scan on band b (cost=0.00..62.50 rows=3050 width=20) (actual time=0.000..0.000 rows=3050
loops=1)
```

```
-> Hash (cost=375.90..375.90 rows=591 width=30) (actual time=16.000..16.000 rows=602 loops=1)
-> Hash Join (cost=297.51..375.90 rows=591 width=30) (actual time=8.000..16.000 rows=602
loops=1)
    Hash Cond: (bhm.member_id = m.member_id)
    -> Seq Scan on band_has_member bhm (cost=0.00..58.44 rows=3744 width=14) (actual
time=0.000..4.000 rows=3744 loops=1)
    -> Hash (cost=290.13..290.13 rows=591 width=24) (actual time=8.000..8.000 rows=602
loops=1)
        -> Hash Join (cost=211.75..290.13 rows=591 width=24) (actual time=4.000..8.000
rows=602 loops=1)
            Hash Cond: ((m.person_cpf)::text = (p.cpf)::text)
            -> Seq Scan on member m (cost=0.00..58.44 rows=3744 width=14) (actual
time=0.000..0.000 rows=3744 loops=1)
            -> Hash (cost=196.98..196.98 rows=1181 width=30) (actual
time=4.000..4.000 rows=1181 loops=1)
                -> Bitmap Heap Scan on person p (cost=50.36..196.98 rows=1181
width=30) (actual time=0.000..4.000 rows=1181 loops=1)
                    Recheck Cond: (age < 25)
                    Filter: ((gender)::text = 'male'::text)
                    -> Bitmap Index Scan on person_age_index (cost=0.00..50.06
rows=2375 width=0) (actual time=0.000..0.000 rows=2362 loops=1)
                        Index Cond: (age < 25)
Total runtime: 24.000 ms
(18 linhas)
```