Sales

**Query 1.**

No Index

"GroupAggregate (cost=277118.03..330611.22 rows=100000 width=21) (actual time=1930.962..4183.447 rows=8 loops=1)"

**Query 2.**

No Index:

"HashAggregate (cost=91931.12..91931.75 rows=50 width=128) (actual time=2285.719..2285.722 rows=7 loops=1)”

**Query 3.**

with no index:

"Sort (cost=37739.03..37739.04 rows=1 width=14) (actual time=185.242..185.242 rows=0 loops=1)"

with index:

CREATE INDEX index3 on sales.sale(customer\_id, product\_id, quantity, price)

"Sort (cost=8.47..8.48 rows=1 width=14) (actual time=0.017..0.017 rows=0 loops=1)"

**Index helps!**

**Query 4.**

No improvement with indexing

"Sort (cost=321558.87..322178.92 rows=248022 width=14) (actual time=10425.473..11690.497 rows=2000000 loops=1)"

**Query 5.**

No improvement with indexing

"GroupAggregate (cost=485594.31..508719.31 rows=250000 width=128) (actual time=44465.520..48908.984 rows=35000 loops=1)"

**Query 6.**

with no index:

"Sort (cost=206072.90..206073.10 rows=80 width=18) (actual time=6589.262..6589.269 rows=80 loops=1)"

CREATE INDEX product\_index ON sales.sale(product\_id);

CREATE INDEX category\_index ON sales.product(category\_id);

"Sort (cost=168252.13..168252.33 rows=80 width=18) (actual time=5937.911..5937.922 rows=80 loops=1)"

**Index helps!**