Advanced Databases
INZ000109P
Project
13 - Summary (dev.)

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- ### FIRST QUERY

```
SELECT product_id,brand_name ,product_name, model_year, list_price, category_name FROM
(
        (SELECT * FROM
                (SELECT * FROM
                     ( SELECT * from MUTABAY.products prod_outer
                          where 1 = (
                                   SELECT COUNT(Distinct list_price)
                                   FROM MUTABAY.products prod_inner
                                   WHERE prod_outer.brand_id = prod_inner.brand_id
                                   AND prod_outer.list_price < prod_inner.list_price
                                   )
                     ) prod
                     FULL OUTER JOIN
                     MUTABAY.brands brands on brands.brand_id = prod.brand_id
                ) prod_brand
                FULL OUTER JOIN
                MUTABAY.categories categories on categories.category_id = prod_brand.category_id
        )prod_brand_cat
)
where list_price > 980000 AND model_year < 2020

GROUP BY product_id,brand_name ,product_name, model_year, list_price, category_name
ORDER BY product_id ASC;
```

EXECUTION TIME COMPARISON

TRYING	WITHOUT IMPROVEMENTS	AFTER PARTITIONS-INDEXES
1	1.779	0.532
2	1.73	0.387
3	1.822	0.406
4	1.751	0.389
5	1.73	0.384
6	1.74	0.392
7	1.724	0.403
8	1.744	0.394
9	1.742	0.395
10	1.743	0.382
MAX	1.822	0.532
MIN	1.73	0.382
AVERAGE	1.7505	0.406
COSTS	23220	383K

WITHOUT ANY IMPROVEMENTS AVERAGE TIME = 1.7505
AFTER PARTITIONES-INEDXES = 0.406

- **SECOND QUERY**

```
SELECT first_name,last_name, active, salary, stores.store_name, stores.city, stores.state
FROM
(
        SELECT staffs.*,avg(salary) over (partition by store_id) as avgSalary
        from MUTABAY.staffs staffs
)staffs
FULL OUTER JOIN MUTABAY.stores stores
ON staffs.store_id=stores.store_id
FULL OUTER JOIN MUTABAY.orders orders
ON stores.store_id = orders.store_id
FULL OUTER JOIN MUTABAY.order_items order_items
ON orders.order_id = order_items.order_id
FULL OUTER JOIN MUTABAY.products products
ON order_items.product_id = products.product_id
WHERE staffs.salary < staffs.avgsalary or order_items.discount > 0.05 OR customer_id > 1500
GROUP BY store_name, first_name, salary, city, state, last_name, active
having (avg(staffs.salary) > 1000 OR state IS NOT NULL) OR (city = 'Aberdeen' AND active = 1)
ORDER BY store_name asc;
```

TRYING	**WITHOUT IMPROVEMENTS**	**AFTER PARTITIONS – COLUMNAR**
1	**1.67**	**0.563**
2	**1.208**	**1.206**
3	**1.188**	**1.24**
4	**1.194**	**1.274**
5	**1.217**	**1.338**
6	**1.164**	**1.338**
7	**1.314**	**1.18**
8	**1.357**	**1.213**

9	3.513	1.185
10	3.329	1.352
MAX	3.513	1.352
MIN	1.164	0.563
AVERAGE	1.7514	1.188
COSTS	165K	165K

WITHOUT ANY IMPROVEMENTS AVERAGE TIME = 1.751
PARTITION – COLUMNAR STORAGE AVERAGE TIME = A 1.188

- **THIRD QUERY**

```
SELECT   products.product_id, products.product_name, products.list_price,
          orders.order_date, orders.required_date, orders.order_status,
          categories.category_name, brands.brand_name, quantity_id,
          discount,COUNT(quantity_id) quantity_count, (quantity_id * discount * products.list_price) total
FROM MUTABAY.order_items order_items
     full outer join MUTABAY.orders orders on
          (orders.order_id = order_items.order_id)
     full outer join MUTABAY.products products on
          (products.product_id = order_items.product_id)
     full outer join MUTABAY.brands brands on
          (brands.brand_id = products.brand_id)
     full outer join MUTABAY.categories categories on
          (categories.category_id = products.category_id)
     full outer join MUTABAY.staffs staffs on
          (staffs.staff_id = orders.staff_id)
     WHERE    (shipped_date   - order_date ) > 2   OR
          (shipped_date - order_date ) = 0     OR
          (shipped_date - order_date ) < 0
GROUP BY products.product_id, products.product_name, products.list_price,
         orders.order_date, orders.required_date, orders.order_status,
         categories.category_name, brands.brand_name, quantity_id,
         discount
having AVG(list_price) > 10000
Order by order_status;
```

TRYING	WITHOUT IMPROVEMENTS	AFTER INDEXES-COLUMNAR STORAGE
1	0.713	0.804
2	0.707	0.706
3	0.722	0.905
4	0.952	0.911
5	0.912	0.906
6	0.772	0.907
7	0.822	0.836
8	0.795	0.736
9	0.714	0.773
10	0.926	0.769
MAX	0.952	0.911
MIN	0.707	0.706
AVERAGE	0.7985	0.852
COSTS	9204	8535

WITHOUT ANY IMPROVEMENTS AVERAGE TIME = 0.7985
INDEXES-COLUMNAR STORAGE = 0.852

- **FOURTH QUERY**

```
update MUTABAY.products products
set model_year =
          (
            select distinct(product_id) as total_product
            from MUTABAY.order_items order_items
                full outer join MUTABAY.orders orders on
                    (orders.order_id = order_items.order_id)
                full outer join MUTABAY.stores stores on
                    (orders.store_id = stores.store_id)
                where stores.store_id =
                     (
                    select store_id from MUTABAY.stocks
                        full outer join MUTABAY.products products on
                            (stocks.product_id = products.product_id)
                                where ((model_year between 2020 and 1958) or (ROUND(list_price) < 990.000))
                                       or UPPER ( SUBSTR(product_name,2,3 ) )LIKE 'D%'
                                fetch first 1 rows only
                     )
```

```
        fetch first 1 rows only
    );
```

TRYING	WITHOUT IMPROVEMENTS	AFTER PARTITIONS - INDEXES
1	1.379	5.973
2	0.813	5.68
3	0.85	5.619
4	0.741	5.3
5	1.251	5.899
6	0.653	6.093
7	0.798	5.144
8	0.666	5.810
9	0.731	6.102
10	0.667	4.807
MAX	1.379	6.102
MIN	0.653	4.807
AVERAGE	0.8549	5.642
COSTS	996	5372

WITHOUT ANY IMPROVEMENTS AVERAGE TIME = 0.8549
PARTITIONED – INDEXES = 5.642

- **FIFTH QUERY**

```
update MUTABAY.order_items set quantity_id =
(
    select quantity_id from MUTABAY.products products
    full outer join MUTABAY.order_items order_items on order_items.product_id = products.product_id
    full outer join MUTABAY.stocks stocks on stocks.product_id = products.product_id
    full outer join MUTABAY.orders orders on order_items.order_id=orders.order_id
    full outer join MUTABAY.customers customers on orders.customer_id=customers.customer_id
    full outer join MUTABAY.stores stores on orders.store_id=stores.store_id
    full outer join MUTABAY.staffs staffs on orders.staff_id=staffs.staff_id
    where products.product_id in
        (
            Select product_id from MUTABAY.order_items where order_id in
            (
                Select order_id from MUTABAY.orders
                WHERE
                (order_status = 1 AND ( shipped_date - required_date = 1 ))
                OR
                (order_status = 2 AND (shipped_date - required_date = 0 ))
            )
        )fetch next 1 rows only
);
```

TRYING	WITHOUT IMPROVEMENTS	AFTER PARTITIONS - INDEXES
1	**3.365**	**2.639**
2	**3.598**	**2.638**
3	**4.786**	**5.86**
4	**2.713**	**3.02**
5	**2.517**	**4.705**
6	**3.69**	**2.886**
7	**2.986**	**2.629**
8	**2.786**	**3.623**
9	**1.884**	**2.81**
10	**2.616**	**3.206**
MAX	**4.786**	**5.86**
MIN	**1.884**	**2.629**
AVERAGE	**3.0941**	**3.401**
COSTS	**5372**	**4091**

WITHOUT ANY IMPROVEMENTS AVERAGE TIME = 3.0941
PARTITIONED – INDEXES AVG TIME = 3.401

- **SIXTH QUERY**

```
UPDATE MUTABAY.stores
SET MUTABAY.stores.store_name = (
    SELECT store_name FROM MUTABAY.stores stores
    INNER JOIN
    (
        SELECT order_i.staff_id, first_name, last_name, phone, email, order_i.store_id, manager_id, active,
salary ,
        order_i.item_id ,order_i.product_id ,order_i.quantity_id ,order_i.discount ,order_i.customer_id
,order_i.order_status ,
        order_i.order_date ,order_i.required_date ,order_i.shipped_date
        FROM MUTABAY.staffs staffs
        FULL OUTER JOIN
        (
            SELECT orders.order_id, item_id, product_id, quantity_id, discount, orders.customer_id,
orders.order_status,
                    orders.order_date, orders.required_date, orders.shipped_date, orders.store_id,
orders.staff_id
            FROM MUTABAY.order_items order_items
            FULL OUTER JOIN MUTABAY.orders orders
            ON orders.order_id = order_items.order_id
            WHERE ORDERS.ORDER_ID IN (SELECT ORDER_ID FROM MUTABAY.ORDER_ITEMS WHERE
DISCOUNT > (SELECT AVG(DISCOUNT) FROM MUTABAY.ORDER_ITEMS))
            OR
            (order_status = 2)
        ) order_i
        ON order_i.staff_id = staffs.staff_id
        WHERE (discount > 0.48 AND discount < 0.05) AND salary > 5000
        OR
        (active = 1 AND discount = 0.4)
    )order_i_staff
    ON order_i_staff.store_id = stores.store_id
    WHERE street='1 Fremont Point' or STATE IS NOT NULL
    fetch first 1 rows only
);
```

TRYING	WITHOUT IMPROVEMENTS	AFTER PARTITIONS – COLUMNAR STORAGE
1	8.448	9.014
2	6.416	9.499
3	6.016	9.250
4	5.839	9.574
5	5.698	9.208

6	6.269	9.525
7	5.893	9.507
8	5.741	9.458
9	5.745	9.478
10	5.763	9.568
MAX	8.448	9.574
MIN	5.698	9.014
AVERAGE	6.1828	9.401
COSTS	1105	794

WITHOUT ANY IMPROVEMENTS AVERAGE TIME = 6.1828
PARTITIONED – COLUMNAR STORAGE AVG. TIME = 4.8827