NAME:

RAFAY HUSSIAN

INSTRUCTOR:

Muhammad Abbas

"Sir Abbas, you've been an amazing guide throughout SQL Class! Your teachings and guidance were instrumental in its success. Thank you!"

TOOLS & TECHNOLOGIES:

SQL (PostgreSQL / MySQL)

CSV (For Data Export/Visuals)

PowerPoint(For Reporting)

Store Performance Analysis:

Identify the top 10 stores based on Incremental Revenue (IR) generated during the promotional periods.

```sql
SELECT

fe.store_id,
  (quantity_sold_after_promo - quantity_sold_before_promo) * fe.base_price AS Incremental_Revenue


FROM fact_events AS fe

GROUP BY fe.store_id
ORDER BY Incremental_Revenue DESC
LIMIT 10
```

sults   Messages

store_id	Incremental_Revenue
STMUL-1	2013000
STISL-6	528000
STSIA-7	509860
STRAW-3	229000
STPES-5	200400
STLAH-2	189400
STPES-7	149100
STPES-0	128520
STRAW-0	125460
STHYD-4	113520

Store Performance Analysis:

Determine the bottom 10 stores in terms of Incremental Sold Units (ISU) during
these campaigns.

```sql
SELECT

fe.store_id,
(quantity_sold_after_promo - quantity_sold_before_promo) AS Incremental_Sales

FROM fact_events AS fe

GROUP BY fe.store_id
ORDER BY Incremental_Sales
LIMIT 10
```

lts   Messages

store_id	Incremental_Sales
STPES-3	-73
STPES-8	-71
STISL-2	-67
STHYD-0	-34
STLAH-3	-25
STFAI-0	-20
STPES-6	-15
STSIA-3	-14
STRAW-1	-13
STLAH-1	-13

Store Performance Analysis:

Analyze store performance variations by city, exploring common characteristics among the top-performing stores that can be applied to others.

```sql
SELECT
    st.city,
    COUNT(DISTINCT st.store_id) AS TotalStore,
    fe.promo_type,
    fe.quantity_sold_after_promo - fe.quantity_sold_before_promo AS SoldUnits,
    (fe.quantity_sold_after_promo - fe.quantity_sold_before_promo) * fe.base_price  AS incremental_revenue_per_Store,
    ROUND(AVG( (fe.quantity_sold_after_promo - fe.quantity_sold_before_promo)* fe.base_price ),2) AS Avg_incremental_revenue

FROM fact_events fe
JOIN dim_stores st ON st.store_id = fe.store_id
GROUP BY st.city
ORDER BY incremental_revenue_per_Store DESC;
```

Results   Messages

	city	TotalStore	promo_type	SoldUnits	incremental_revenue_per_Store	Avg_incremental_revenue
1	Hyderabad	5	500 Cashback	385	1155000	99028.09
2	Islamabad	7	BOGOF	158	47400	146858.80
3	Multan	5	BOGOF	124	37200	121124.71
4	Faisalabad	3	BOGOF	33	9900	74885.32
5	Sialkot	8	50% OFF	14	2660	168754.18
6	Lahore	4	50% OFF	28	1736	136256.93
7	Karachi	2	50% OFF	9	1710	77767.67
8	Quetta	2	50% OFF	18	1170	90305.05
9	Rawalpindi	4	25% OFF	-5	-2075	157128.98
10	Peshawar	10	25% OFF	-31	-4836	169214.47

Promotion Type Analysis:

Evaluate which two promotion types yield the highest Incremental Revenue.


```sql
5   SELECT
6       FE.promo_type AS promotion_type ,
7       (FE.quantity_sold_after_promo - FE.quantity_sold_before_promo) * FE.base_price  AS total_incremental_revenue
8   FROM fact_events AS FE
9   GROUP BY FE.promo_type
10  ORDER BY total_incremental_revenue DESC
11  LIMIT 2;
12
```

esults   Messages

promotion_type	total_incremental_revenue
500 Cashback	2013000
33% OFF	113520

Promotion Type Analysis:

Assess which two promotion types result in the lowest Incremental Sold Units.

```sql
---Assess which two promotion types result in the lowest Incremental Sold Units.

SELECT

    FE.promo_type AS promotion_type,
    (FE.quantity_sold_after_promo - FE.quantity_sold_before_promo)  AS  total_incremental_Sales

FROM fact_events AS FE
GROUP BY FE.promo_type
ORDER BY total_incremental_Sales ASC
LIMIT 2;
```

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Results   Messages

promotion_type	total_incremental_Sales
25% OFF	-71
50% OFF	18

Promotion Type Analysis:

Compare the effectiveness of discount-based promotions with alternative types such as BOGOF and cashback.

```sql
SELECT
    fe.promo_type,
    (fe.quantity_sold_after_promo-fe.quantity_sold_before_promo)  AS INCREMENT_Sales,
    (fe.quantity_sold_after_promo - fe.quantity_sold_before_promo) * fe.base_price  AS incremental_revenue

FROM fact_events fe

GROUP BY fe.promo_type
ORDER BY incremental_revenue DESC;
```

Results | Messages

promo_type	INCREMENT_Sales	incremental_revenue
500 Cashback	671	2013000
33% OFF	132	113520
BOGOF	63	18900
50% OFF	18	3420
25% OFF	-71	-11076

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Promotion Type Analysis:

Determine the optimal balance between achieving Incremental Sold Units and maintaining healthy profit margins.

```sql
SELECT
        FE.base_price,
        FE.promo_type,
        CM.cost_margin,
        (FE.quantity_sold_after_promo - FE. quantity_sold_before_promo) AS Incremental_Sales,
        (FE.quantity_sold_after_promo - FE. quantity_sold_before_promo) * base_price AS Incremental_Revenue,
        (FE.quantity_sold_after_promo - FE. quantity_sold_before_promo) * base_price * CM.cost_margin AS EstimatedProfit,
        CASE
         WHEN SUM((FE.quantity_sold_after_promo - FE. quantity_sold_before_promo) * base_price) = 0 THEN 0
         ELSE
          CAST(SUM((FE.quantity_sold_after_promo - FE. quantity_sold_before_promo) * base_price * CM.cost_margin) * 1 /
           SUM((FE.quantity_sold_after_promo - FE. quantity_sold_before_promo) * base_price) AS INT)
        END AS PROFIT_MARGIN

from  cost_margin AS CM
INNER JOIN fact_events AS FE
ON CM.product_code = FE.product_code

GROUP BY FE.promo_type,CM.cost_margin
ORDER BY EstimatedProfit DESC
```

sults   Messages

base_price	promo_type	cost_margin	Incremental_Sales	Incremental_Revenue	EstimatedProfit	PROFIT_MARGIN
3000	500 Cashback	27	671	2013000	54351000	27
370	BOGOF	38	764	282680	10741840	38
200	BOGOF	40	947	189400	7576000	40
860	33% OFF	33	132	113520	3746160	33
1020	BOGOF	28	126	128520	3598560	28
350	BOGOF	31	172	60200	1866200	31
1190	BOGOF	21	49	58310	1224510	21
300	BOGOF	27	63	18900	510300	27

Product and Category Analysis:

Pinpoint specific products that demonstrate exceptional performance, either positively or negatively in response to promotions.

```sql
SELECT

    DP.product_name,
    (FE.quantity_sold_after_promo - FE.quantity_sold_before_promo)  AS Sales_Lift

FROM fact_events AS FE
JOIN dim_products AS DP
ON DP.product_code = FE.product_code
GROUP BY DP.product_name
ORDER BY Sales_Lift

LIMIT 10
```

lts   Messages

product_name	Sales_Lift
Farm Chakki Atta (1KG)	-73
Suflower Oil (1L)	-71
Scrub Sponge For Dishwash	-15
Body Milk Nourishing Lotion (120ML)	-13
Fusion Container Set of 3	-8
Cream Beauty Bathing Soap (125GM)	-5
Doodh Kesar Body Lotion (200ML)	18
Double Bedsheet set	49
Lime Cool Bathing Bar (125GM)	53
Curtains	63

Product and Category Analysis:

Examine the correlation between product categories and the effectiveness of various promotion types.

```sql
SELECT
        DP.category,

        FE.promo_type AS promotion_type,
        (FE.quantity_sold_after_promo - FE.quantity_sold_before_promo) AS Incremental_Sales,
        (FE.quantity_sold_after_promo - FE.quantity_sold_before_promo) * FE.base_price AS Incremental_Revenue

        FROM fact_events FE
        JOIN dim_products DP
        ON DP.product_code = FE.product_code

        GROUP BY DP.category,FE.promo_type
        ORDER BY Incremental_Sales DESC;
```

Messages

category	promotion_type	Incremental_Sales	Incremental_Revenue
Grocery & Staples	BOGOF	947	189400
Combo1	500 Cashback	671	2013000
Home Appliances	BOGOF	172	60200
Grocery & Staples	33% OFF	132	113520
Home Care	BOGOF	63	18900
Personal Care	50% OFF	18	3420
Personal Care	25% OFF	-5	-250
Home Care	25% OFF	-15	-825
Grocery & Staples	25% OFF	-71	-11076

Product and Category Analysis:

Identify the product categories that experience the most significant sales lift during discount campaigns.

```sql
SELECT

    DP.product_name,
    (FE.quantity_sold_after_promo - FE.quantity_sold_before_promo)  AS Sales_Lift


FROM fact_events AS FE
JOIN dim_products AS DP
ON DP.product_code = FE.product_code
GROUP BY DP.product_name
ORDER BY Sales_Lift DESC

LIMIT 10
```

sults   Messages

product_name	Sales_Lift
Home Essential 8 Product Combo	671
High Glo 15W LED Bulb	172
Sonamasuri Rice (10KG)	132
Waterproof Immersion Rod	126
Masoor Dal (1KG)	72
Curtains	63
Lime Cool Bathing Bar (125GM)	53
Double Bedsheet set	49
Doodh Kesar Body Lotion (200ML)	18
Cream Beauty Bathing Soap (125GM)	-5
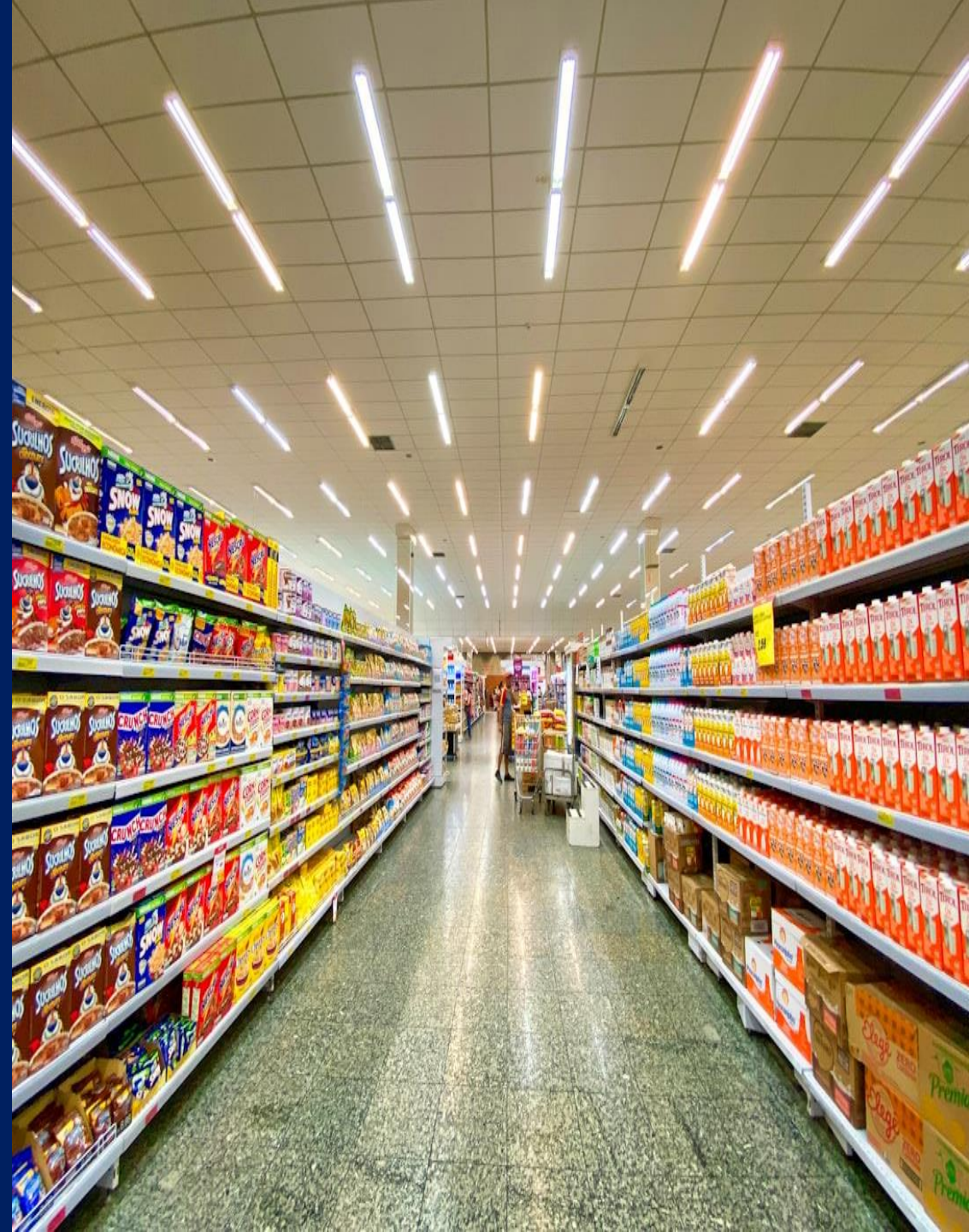
Conclusion:

Mart365 highlights how SQL can be used not only to store and manage retail data but also to drive data-driven strategies, optimize sales performance, and enhance customer satisfaction. The insights generated provide a strong foundation for advanced analytics in Power BI, Python, or Machine Learning, enabling Mart365 to evolve into a fully data-driven retail ecosystem.