

1. SELECT: View sample rows

SELECT *

FROM retail_data

LIMIT 20;

```

1
2   SELECT *
3     FROM retail_data
4   LIMIT 20;
5

```

Invoice	stock_code	description	quantity	Invoice_date	price	customer_id	country
536365	85123A	WHITE HANGING HEART T-LIGHT HOLDER	6	2010-12-01 08:26:00	2.55	17850	United Kingdom
536365	71053	WHITE METAL LANTERN	6	2010-12-01 08:26:00	3.99	17850	United Kingdom
536365	84409B	CREAM CUPID HEARTS COAT HANGER	8	2010-12-01 08:26:00	2.75	17850	United Kingdom
536365	84029G	KNITTED UNION FLAG HOT WATER BOTTLE	6	2010-12-01 08:26:00	3.99	17850	United Kingdom
536365	84029E	RED WOOLLY HOTTIE WHITE HEART	6	2010-12-01 08:26:00	3.99	17850	United Kingdom
536365	27752	SET 7 BABUSHKA NESTING BOXES	2	2010-12-01 08:26:00	7.65	17850	United Kingdom
536365	21730	GLASS STAR FROSTED T-LIGHT HOLDER	6	2010-12-01 08:26:00	4.25	17850	United Kingdom
536366	22633	HAND WARMER UNION JACK	6	2010-12-01 08:28:00	1.85	17850	United Kingdom
536366	22632	HAND WARMER RED POLKA DOT	6	2010-12-01 08:28:00	1.85	17850	United Kingdom
536366	22960	JAM MAKING SET WITH JARS	6	2010-12-01 08:34:00	4.25	13047	United Kingdom
536366	22913	RED COAT RACK PARIS FASHION	3	2010-12-01 08:34:00	4.95	13047	United Kingdom
	???	YELLOW COAT RACK PARIS FASHION	3	2010-12-01 08:34:00	4.95	13047	United Kingdom

2. WHERE: Filter rows based on conditions

SELECT *

FROM retail_data

WHERE country = 'United Kingdom'

AND quantity > 10

LIMIT 20;

```

1
2   SELECT *
3     FROM retail_data
4   WHERE country = 'United Kingdom'
5   AND quantity > 10
6
7

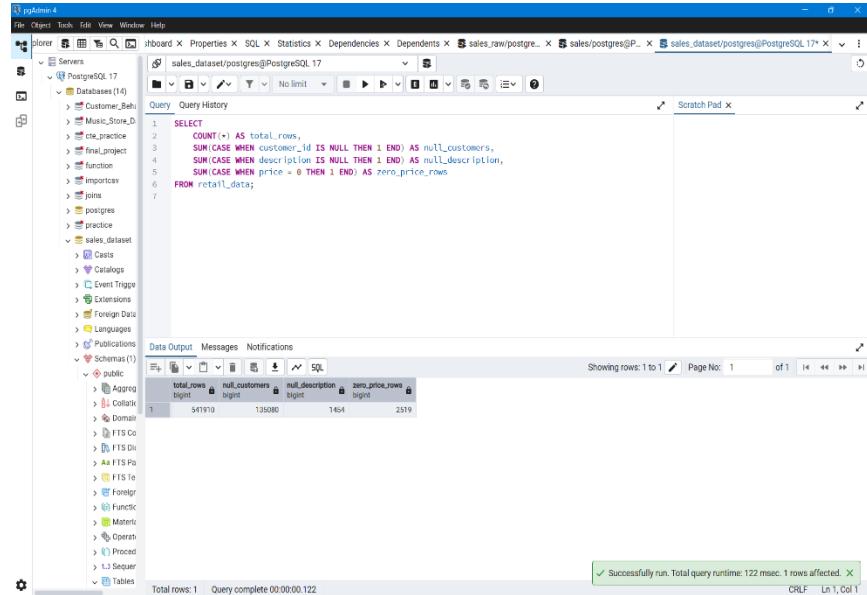
```

Invoice	stock_code	description	quantity	Invoice_date	price	customer_id	country
536367	84879	ASSORTED COLOUR BIRD ORNAMENT	32	2010-12-01 08:34:00	1.69	13047	United Kingdom
536371	22086	PAPER CHAIN KIT 90'S CHRISTMAS	80	2010-12-01 09:00:00	2.55	13748	United Kingdom
536374	21258	VICTORIAN SEWING BOX LARGE	32	2010-12-01 09:09:00	10.95	15100	United Kingdom
536376	22114	HOT WATER BOTTLE TEA AND SYMPATHY	48	2010-12-01 09:32:00	3.45	15291	United Kingdom
536376	21733	RED HANGING HEART T-LIGHT HOLDER	64	2010-12-01 09:32:00	2.55	15291	United Kingdom
536378	84997B	RED 3 PIECE RETROSPOT CUTLERY SET	12	2010-12-01 09:37:00	3.75	14688	United Kingdom
536378	21094	SET/6 RED SPOTTY PAPER PLATES	12	2010-12-01 09:37:00	0.85	14688	United Kingdom
536378	21212	PACK OF 72 RETROSPOT CAKE CASES	120	2010-12-01 09:37:00	0.42	14688	United Kingdom
536378	21975	PACK OF 60 DINOSAUR CAKE CASES	24	2010-12-01 09:37:00	0.55	14688	United Kingdom
536378	21977	PACK OF 60 PINK PAISLEY CAKE CASES	24	2010-12-01 09:37:00	0.55	14688	United Kingdom
536378	84991	60 TEA TIME FAIRY CAKE CASES	24	2010-12-01 09:37:00	0.55	14688	United Kingdom

-- 3. Aggregate Functions: Data Quality Summary

SELECT

```
COUNT(*) AS total_rows,  
SUM(CASE WHEN customer_id IS NULL THEN 1 END) AS null_customers,  
SUM(CASE WHEN description IS NULL THEN 1 END) AS null_description,  
SUM(CASE WHEN price = 0 THEN 1 END) AS zero_price_rows  
  
FROM retail_data;
```



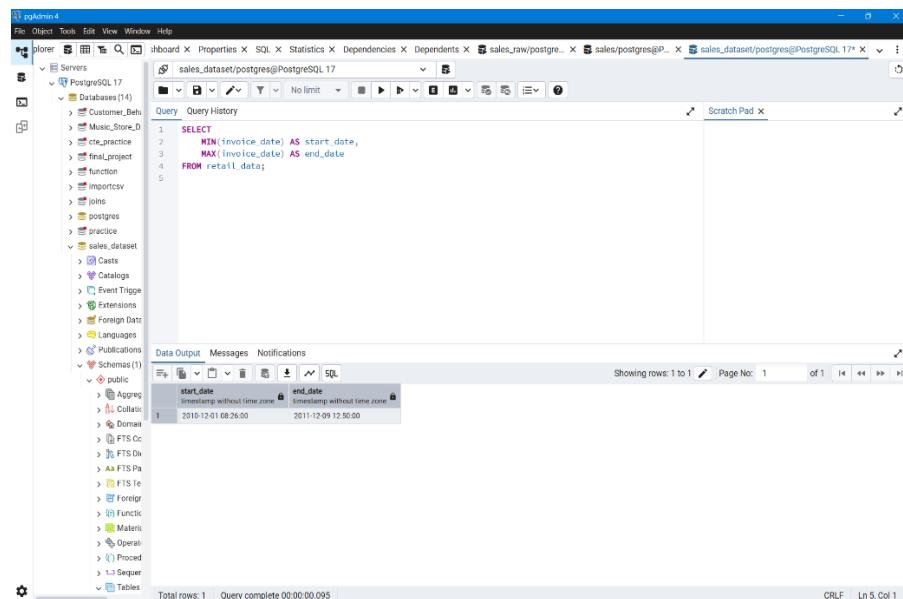
total_rows	null_customer	null_description	zero_price_rows
541910	136080	1464	2519

Successfully run. Total query runtime: 122 msec. 1 rows affected.

-- Date Range Using MIN and MAX

SELECT

```
MIN(invoice_date) AS start_date,  
MAX(invoice_date) AS end_date  
  
FROM retail_data;
```



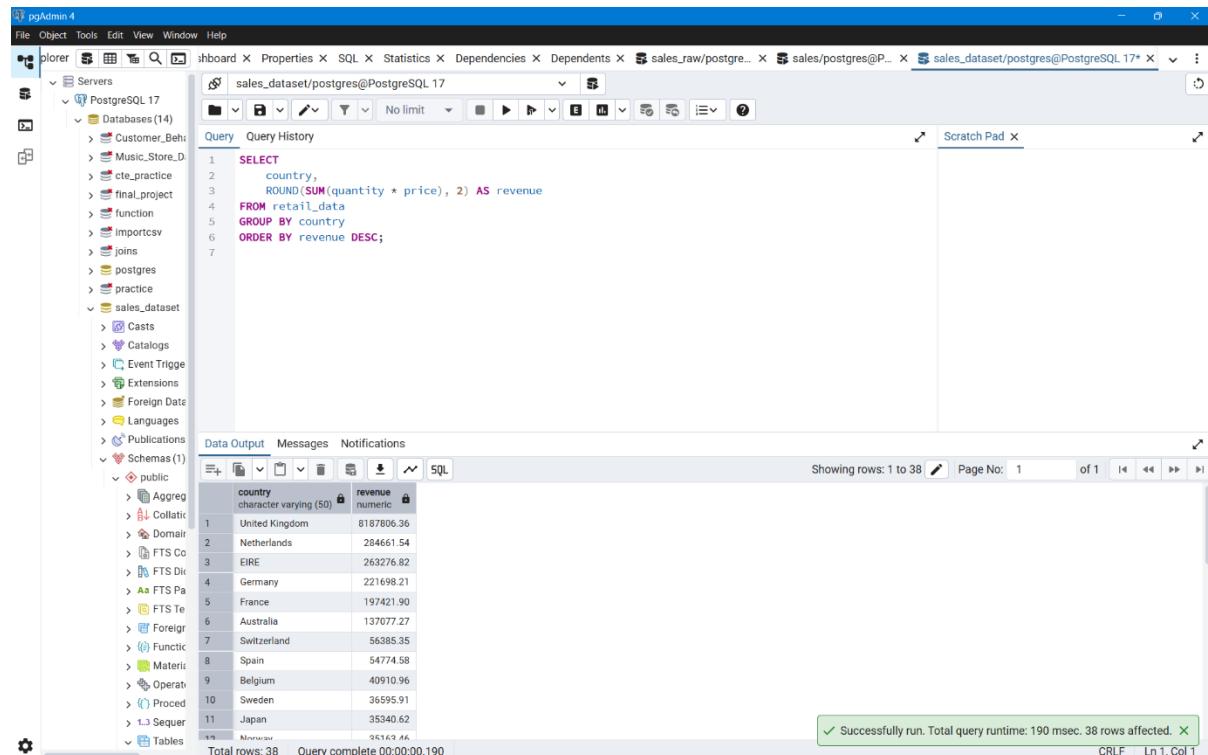
start_date	end_date
2010-12-01 08:26:00	2011-12-09 12:50:00

Successfully run. Total query runtime: 122 msec. 1 rows affected.

-- 4. GROUP BY: Revenue per Country

```
SELECT
```

```
    country,  
    ROUND(SUM(quantity * price), 2) AS revenue  
  
FROM retail_data  
  
GROUP BY country  
  
ORDER BY revenue DESC;
```



```
1  SELECT  
2      country,  
3      ROUND(SUM(quantity * price), 2) AS revenue  
4  FROM retail_data  
5  GROUP BY country  
6  ORDER BY revenue DESC;
```

country	revenue
United Kingdom	8187806.36
Netherlands	284661.54
EIRE	263276.82
Germany	221698.21
France	197421.90
Australia	137077.27
Switzerland	56385.35
Spain	54774.58
Belgium	49910.96
Sweden	36595.91
Japan	35340.62
Monaco	30162.46

-- 5. Subquery: Top 5 Customers by Total Spending

```
SELECT customer_id, total_spent  
  
FROM (   
  
    SELECT  
        customer_id,  
  
        SUM(quantity * price) AS total_spent  
  
    FROM retail_data  
  
    WHERE customer_id IS NOT NULL  
  
    GROUP BY customer_id  
  
) AS t  
  
ORDER BY total_spent DESC  
  
LIMIT 5;
```

```

SELECT customer_id, total_spent
FROM (
    SELECT
        customer_id,
        SUM(quantity * price) AS total_spent
    FROM retail_data
    WHERE customer_id IS NOT NULL
    GROUP BY customer_id
) AS t
ORDER BY total_spent DESC
LIMIT 5;

```

customer_id	total_spent
14646	279489.02
18102	256438.49
17450	187482.17
14911	132572.62
12415	123725.45

Successfully run. Total query runtime: 164 msec. 5 rows affected.

-- 6.1 View: Monthly Revenue

```

CREATE VIEW monthly_revenue AS
SELECT
    DATE_TRUNC('month', invoice_date) AS month,
    SUM(quantity * price) AS revenue
FROM retail_data
GROUP BY month
ORDER BY month;

```

```
SELECT * FROM monthly_revenue;
```

pgAdmin 4

File Object Tools Edit View Window Help

Explorer SQL Properties Statistics Dependencies Dependents sales_raw/postgres@PostgreSQL 17* sales/postgres@PostgreSQL 17* sales_dataset/postgres@PostgreSQL 17*

Servers PostgreSQL 17 Databases (14) Customer_Behavior Music_Store_Demo cte_practice final_project function importcsv joins postgres practice sales_dataset Casts Catalogs Event Triggers Extensions Foreign Data Languages Publications Schemas (1) public Aggregates Collations Domains FTS Configuration FTS Directories FTS Parameters FTS Tables Foreign Functions Materialized Views Operators Procedures Sequences Tables

Query History

```
1 SELECT * FROM monthly_revenue;
```

Data Output Messages Notifications

month	revenue
timestamp without time zone	numeric
1	748957.02
2	560000.26
3	498052.65
4	683267.08
5	493207.12
6	723333.51
7	691123.12
8	681300.11
9	682680.51
10	1019687.62
11	1070704.67
12	1461764.25

Showing rows: 1 to 13 | Page No: 1 of 1 | 14 < > >> | CRLF Ln 2, Col 1

Successfully run

-- 1. INNER JOIN: Show products that have a category

```
SELECT
    r.stock_code,
    r.description,
    r.quantity,
    r.price,
    p.category
FROM retail_data r
INNER JOIN product_category p
    ON r.stock_code = p.stock_code
LIMIT 20;
```

```

SELECT
    r.stock_code,
    r.description,
    r.quantity,
    r.price,
    p.category
FROM retail_data r
INNER JOIN product_category p
    ON r.stock_code = p.stock_code
LIMIT 20;

```

	stock_code	description	quantity	price	category
1	84029E	RED WOOLLY HOTTIE WHITE HEART.	6	3.39	Toys
2	84879	ASSORTED COLOUR BIRD ORNAME...	32	1.69	Cosmetics
3	84029E	RED WOOLLY HOTTIE WHITE HEART.	6	3.39	Toys
4	84029E	RED WOOLLY HOTTIE WHITE HEART.	6	3.39	Toys
5	22386	JUMBO BAG PINK POLKADOT	10	1.95	Kitchen
6	85099B	JUMBO BAG RED RETROSPOT	100	1.65	Home Decor
7	85099B	JUMBO BAG RED RETROSPOT	100	1.65	Home Decor
8	84879	ASSORTED COLOUR BIRD ORNAME...	16	1.69	Cosmetics
9	84879	ASSORTED COLOUR BIRD ORNAME...	32	1.69	Cosmetics
10	84029E	RED WOOLLY HOTTIE WHITE HEART.	6	3.39	Toys
11	84029E	RED WOOLLY HOTTIE WHITE HEART.	6	3.39	Toys
12	84029E	RED WOOLLY HOTTIE WHITE HEART.	4	9.75	Toys

Successfully run. Total query runtime: 64 msec. 20 rows affected.

-- 2. LEFT JOIN: Keep all products, add category if available

SELECT

```

r.stock_code,
r.description,
r.quantity,
r.price,
p.category

FROM retail_data r
LEFT JOIN product_category p
    ON r.stock_code = p.stock_code
LIMIT 20;

```

pgAdmin 4

File Object Tools Edit View Window Help

Explorer Properties SQL Statistics Dependencies Dependents sales_raw/postgres@PostgreSQL 17* sales/postgres@PostgreSQL 17* sales_dataset/postgres@PostgreSQL 17*

Servers PostgreSQL 17 Databases (14) Customer_Behavior Music_Store_Database ete_practice final_project function importcsv joins postgres practice sales_dataset Casts Catalogs Event Triggers Extensions Foreign Data Languages Publications Schemas (1) public Aggregates Collations Domains FTS Cores FTS Directories FTS Parameters FTS Tables Functions Materialized Views Operators Procedures Sequences Tables

Query History

```

1 SELECT
2   r.stock_code,
3   r.description,
4   r.quantity,
5   r.price,
6   p.category
7   FROM retail_data r
8   LEFT JOIN product_category p
9     ON r.stock_code = p.stock_code
10  LIMIT 20;
11

```

Data Output Messages Notifications

	stock_code	description	quantity	price	category
1	22243	5 HOOK HANGER RED MAGIC TOADSTOOL	12	1.65	[null]
2	47421	ASSORTED COLOUR LIZARD SUCTION HOOK	24	0.42	[null]
3	20712	JUMBO BAG WOODLAND ANIMALS	10	1.95	[null]
4	20713	JUMBO BAG OWLS	10	1.95	[null]
5	22837	HOT WATER BOTTLE BABUSHKA	4	4.65	[null]
6	22969	HOMEMADE JAM SCENTED CANDLES	12	1.45	[null]
7	22973	CHILDREN'S CIRCUS PARADE MUG	12	1.65	[null]
8	845698	PACK 3 FIRE ENGINE/CAR PATCHES	12	1.25	[null]
9	22549	PICTURE DOMINOES	12	1.45	[null]
10	POST	POSTAGE	1	18.00	[null]
11	22815	CARD PSYCHEDELIC APPLES	12	0.42	[null]
12	??66K	WAND WANDERER OWL DESIGN	1	2.10	[null]

Total rows: 20 Query complete 00:00:00.900

Successfully run. Total query runtime: 90 msec. 20 rows affected.

-- 3. RIGHT JOIN: Show all categories, even if no sales exist

SELECT

```

r.stock_code,
r.description,
r.quantity,
r.price,
p.category
FROM retail_data r
RIGHT JOIN product_category p
ON r.stock_code = p.stock_code
LIMIT 20;

```

pgAdmin 4

File Object Tools Edit View Window Help

Explorer Properties SQL Statistics Dependencies Dependents sales_raw/postgres@PostgreSQL 17* sales/postgres@PostgreSQL 17* sales_dataset/postgres@PostgreSQL 17*

Servers PostgreSQL 17 Databases (14) Customer_Behavior Music_Store_Demo cte_practice final_project function importcsv joins postgres practice sales_dataset Casts Catalogs Event Triggers Extensions Foreign Data Languages Publications Schemas (1) public Aggregates Collations Domains FTS Cores FTS Directories FTS Parameters FTS Tables Foreign Functions Functions Materials Operators Procedures Sequences Tables

Query History

```

1 SELECT
2   r.stock_code,
3   r.description,
4   r.quantity,
5   r.price,
6   p.category
7   FROM retail_data r
8   RIGHT JOIN product_category p
9     ON r.stock_code = p.stock_code
10    LIMIT 20;
11

```

Data Output Messages Notifications

	stock_code	description	quantity	price	category
1	84679	ASSORTED COLOUR BIRD ORNAMENT	80	1.69	Cosmetics
2	22386	JUMBO BAG PINK POLKADOT	30	1.95	Kitchen
3	850998	JUMBO BAG RED RETROSPOT	40	1.95	Home Decor
4	84029E	RED WOOLLY HOTTIE WHITE HEART	1	7.62	Toys
5	850998	JUMBO BAG RED RETROSPOT	1	4.21	Home Decor
6	84029E	RED WOOLLY HOTTIE WHITE HEART	1	3.75	Toys
7	850998	JUMBO BAG RED RETROSPOT	70	1.65	Home Decor
8	84029E	RED WOOLLY HOTTIE WHITE HEART	96	2.95	Toys
9	850998	JUMBO BAG RED RETROSPOT	30	1.65	Home Decor
10	850998	JUMBO BAG RED RETROSPOT	200	1.65	Home Decor
11	84029E	RED WOOLLY HOTTIE WHITE HEART	384	2.95	Toys
12	??98A	WIND UP RACER POLKADOT	1	1.05	Kitchen

Total rows: 20 Query complete 00:00:00.056

Successfully run. Total query runtime: 56 msec. 20 rows affected.

-- 4. FULL OUTER JOIN: All rows from both tables

SELECT

```

r.stock_code,
r.description,
r.quantity,
r.price,
p.category
FROM retail_data r
FULL OUTER JOIN product_category p
ON r.stock_code = p.stock_code;

```

pgAdmin 4

File Object Tools Edit View Window Help

Explorer Properties SQL Statistics Dependencies Dependents sales_raw/postgres@... sales/postgres@P... sales_dataset/postgres@PostgreSQL 17*

Servers PostgreSQL 17 Databases (14) Customer_Behavior Music_Store_Demo cte_practice final_project function importcsv joins postgres practice sales_dataset Casts Catalogs Event Triggers Extensions Foreign Data Languages Publications Schemas (1) public Aggregates Collations Domains FTS Configuration FTS Directories FTS Parameters FTS Tables Foreign Functions Materialized Views Operators Procedures Sequences Tables

Query History

```

1 SELECT
2   r.stock_code,
3   r.description,
4   r.quantity,
5   r.price,
6   p.category
7 FROM retail_data r
8 FULL OUTER JOIN product_category p
9   ON r.stock_code = p.stock_code;
10

```

Data Output Messages Notifications

Showing rows: 1 to 1000 | Page No: 1 of 542 | 14 < > << >>

	stock_code	description	quantity	price	category
1	44092B	BLUE WHITE PLASTIC RINGS LAMPSHADE	3	0.85	[null]
2	44092B	BLUE WHITE PLASTIC RINGS LAMPSHADE	3	0.85	[null]
3	44092B	BLUE WHITE PLASTIC RINGS LAMPSHADE	1	0.85	[null]
4	44092B	BLUE WHITE PLASTIC RINGS LAMPSHADE	1	0.85	[null]
5	44092B	BLUE WHITE PLASTIC RINGS LAMPSHADE	6	0.85	[null]
6	84992	72 SWEETHEART FAIRY CAKE CASES	1	1.28	[null]
7	84992	72 SWEETHEART FAIRY CAKE CASES	1	1.28	[null]
8	84992	72 SWEETHEART FAIRY CAKE CASES	24	0.55	[null]
9	84992	72 SWEETHEART FAIRY CAKE CASES	24	0.55	[null]
10	84992	72 SWEETHEART FAIRY CAKE CASES	24	0.55	[null]
11	84992	72 SWEETHEART FAIRY CAKE CASES	2	0.55	[null]
12	84992	72 SWEETHEART FAIRY CAKE CASES	6	0.55	[null]

Total rows: 541910 Query complete 00:00:00.556 CRLF Ln 1, Col 1

Conclusion

SQL analysis was performed successfully across filtering, grouping, joins, subqueries, view creation, and optimization.