UK TRAIN RIDES

Analysis – SQL CASE STUDY

CREATED BY – RANA BASAK

INTRODUCTION

Mock train ticket data for National Rail in the UK, from Jan to Apr 2024, including details on the type of ticket, the date & time for each journey, the departure & arrival stations, the ticket price, and more.
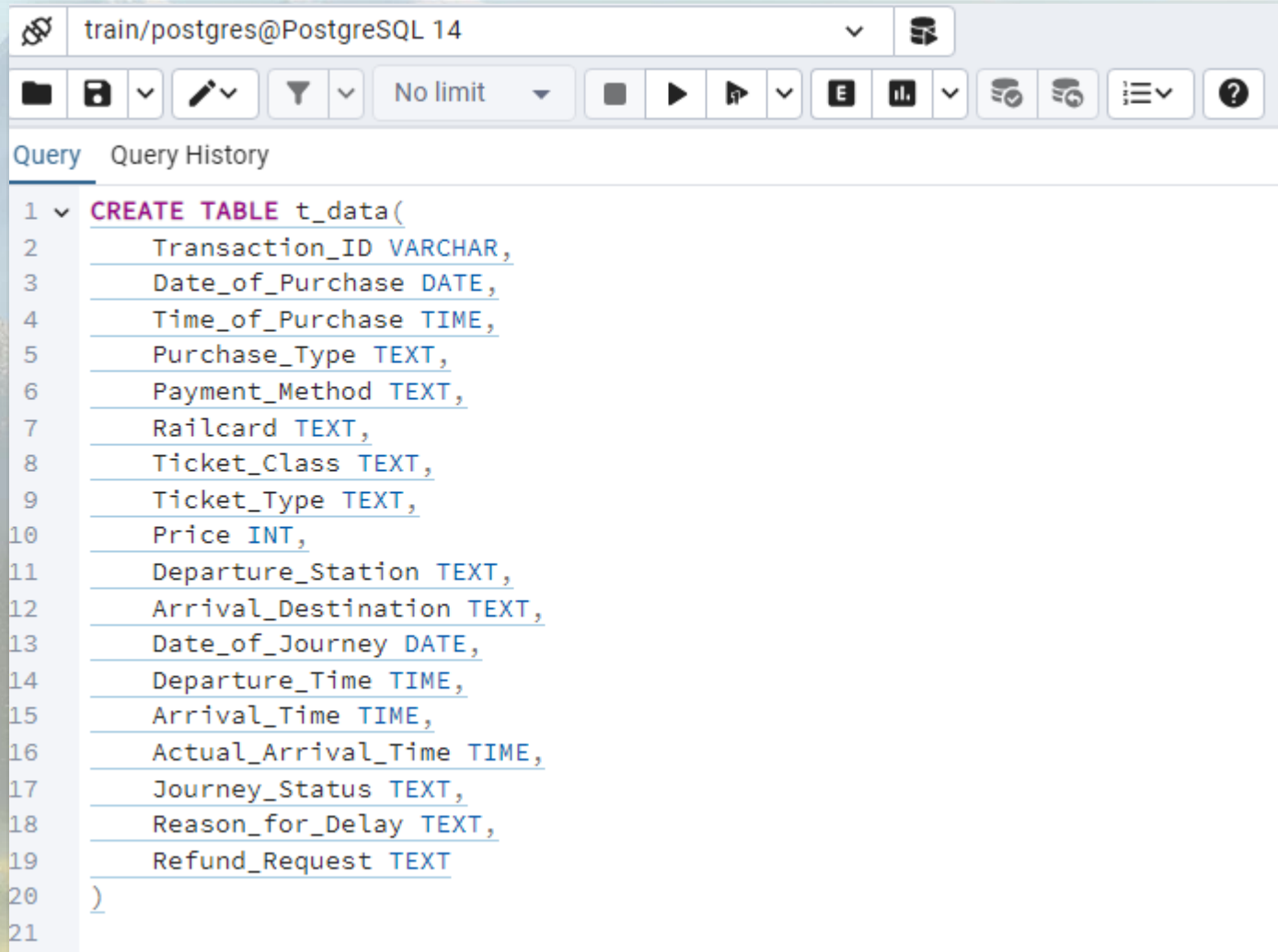
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OBJECTIVES

1. What are the most popular routes?

2. What are the peak travel times?

3. How does revenue vary by ticket types and classes?

4. What is the on-time performance?

5. What are the main contributing factors?

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DATASET

- Transaction ID
- Date of Purchase
- Time of Purchase
- Purchase Type
- Payment Method
- Railcard
- Ticket Class
- Ticket Type
- Price
- Departure Station
- Arrival Destination
- Date of Journey
- Departure Time
- Arrival Time
- Actual Arrival Time
- Journey Status
- Reason for Delay
- Refund Request

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CREATE TABLE IN SQL DATABASE

train/postgres@PostgreSQL 14

Query   Query History

```sql
1   CREATE TABLE t_data(
2       Transaction_ID VARCHAR,
3       Date_of_Purchase DATE,
4       Time_of_Purchase TIME,
5       Purchase_Type TEXT,
6       Payment_Method TEXT,
7       Railcard TEXT,
8       Ticket_Class TEXT,
9       Ticket_Type TEXT,
10      Price INT,
11      Departure_Station TEXT,
12      Arrival_Destination TEXT,
13      Date_of_Journey DATE,
14      Departure_Time TIME,
15      Arrival_Time TIME,
16      Actual_Arrival_Time TIME,
17      Journey_Status TEXT,
18      Reason_for_Delay TEXT,
19      Refund_Request TEXT
20  )
21
```

Q1 What are the most popular routes?

```sql
WITH NEW_D AS (
    SELECT transaction_id,CONCAT(departure_station,' to ',arrival_destination) as routes
    FROM t_data)

select routes ,
    rank () over (order by count(routes)) as ranking ,
    count(transaction_id)
    from NEW_D
    GROUP BY routes
    order by ranking desc
    limit 5
```

Output

	routes text	ranking bigint	count bigint
1	Manchester Piccadilly to Liverpool Lime Street	65	4628
2	London Euston to Birmingham New Street	64	4209
3	London Kings Cross to York	63	3922
4	London Paddington to Reading	62	3873
5	London St Pancras to Birmingham New Street	61	3471

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Q2 What are the peak travel times?

```sql
1   with nt as (
2       select extract(hour from (departure_time)) as hours
3       from t_data
4   )
5       select hours,
6   rank() over(order by count(hours)) as ranking
7   from nt
8   group by hours
9   order by ranking desc
10  limit 5
```

Output

	hours numeric	ranking bigint
1	18	24
2	6	23
3	17	22
4	7	21
5	16	20

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Q3 How does revenue vary by ticket type and class?

```sql
1  select ticket_class,ticket_type , sum(price) as revenue
2  from t_data
3  group by ticket_class,ticket_type
4  order by revenue desc
```

Output

	ticket_class text	ticket_type text	revenue bigint
1	Standard	Advance	242388
2	Standard	Off-Peak	178666
3	Standard	Anytime	171468
4	First Class	Advance	66886
5	First Class	Off-Peak	44672
6	First Class	Anytime	37841

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Q4 What is the on time performance?

```sql
1  SELECT journey_status,count(journey_status) as total
2  from t_data
3  group by journey_status
4  order by total desc
```

Output

journey_status	total
text	bigint
On Time	27481
Delayed	2292
Cancelled	1880

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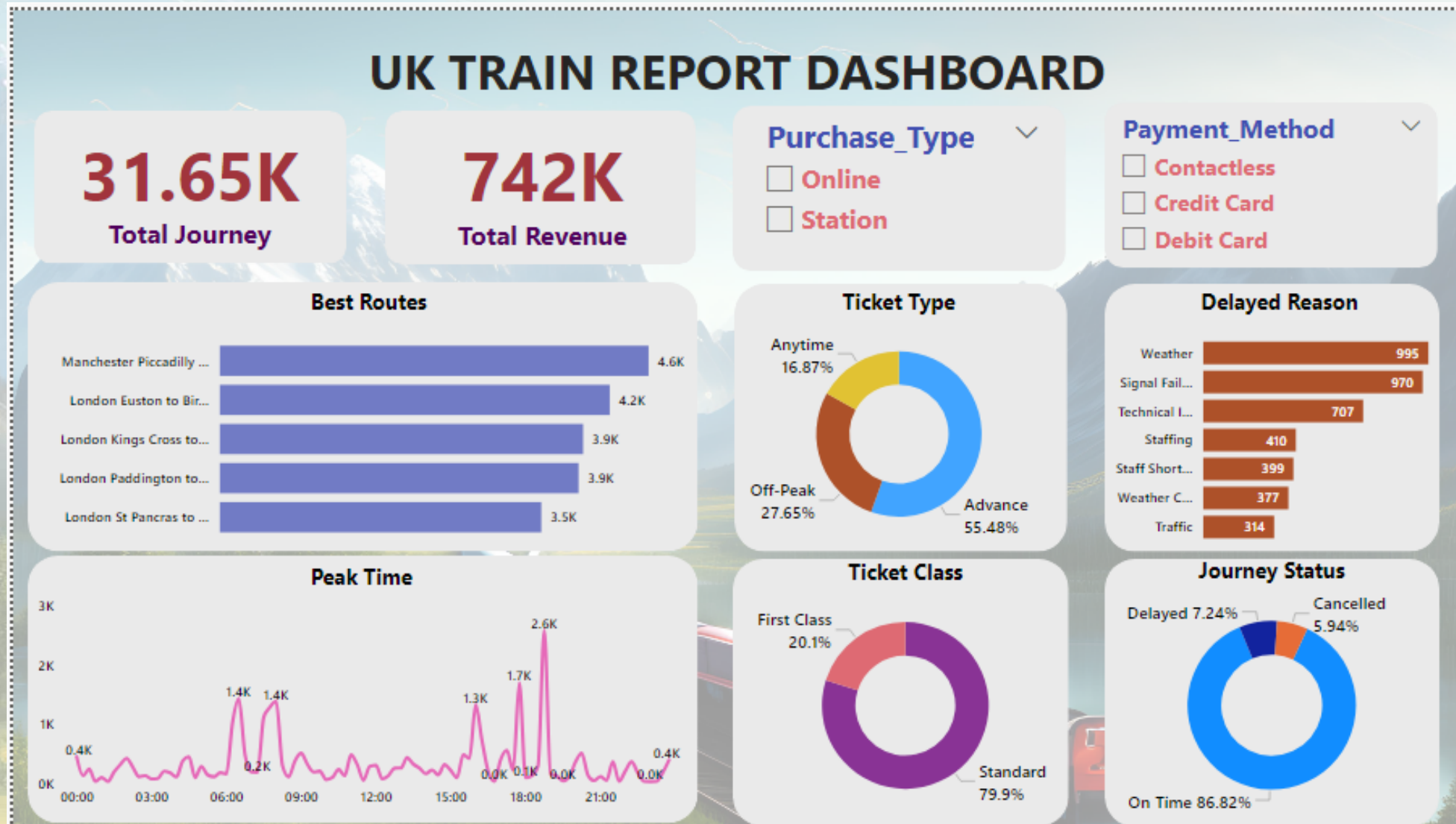# Q5 What are the main contributing factors?

```sql
1  select reason_for_delay, count(reason_for_delay) as number_of_delay
2  from t_data
3  group by reason_for_delay
4  order by number_of_delay desc
5  limit 5
```

Output

reason_for_delay text	number_of_delay bigint
Weather	995
Technical Issue	707
Signal Failure	523
Signal failure	447
Staffing	410

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Dashboard

UK TRAIN REPORT DASHBOARD

31.65K — Total Journey

742K — Total Revenue

Purchase_Type
- ☐ Online
- ☐ Station

Payment_Method
- ☐ Contactless
- ☐ Credit Card
- ☐ Debit Card

Best Routes
- Manchester Piccadilly … — 4.6K
- London Euston to Bir… — 4.2K
- London Kings Cross to… — 3.9K
- London Paddington to… — 3.9K
- London St Pancras to … — 3.5K

Ticket Type
- Anytime 16.87%
- Advance 55.48%
- Off-Peak 27.65%

Delayed Reason
- Weather — 995
- Signal Fail… — 970
- Technical I… — 707
- Staffing — 410
- Staff Short… — 399
- Weather C… — 377
- Traffic — 314

Peak Time
- 0.4K, 1.4K, 1.4K, 0.2K, 1.3K, 1.7K, 2.6K, 0.0K, 0.1K, 0.0K, 0.0K, 0.4K

Ticket Class
- First Class 20.1%
- Standard 79.9%

Journey Status
- Delayed 7.24%
- Cancelled 5.94%
- On Time 86.82%

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Insights

- Most popular route used by people is "Manchester Piccadilly to Liverpool Lime Street"

- Peak travel time in UK is between "6 am to 8 am" and "4 pm to 7 pm"

- Most revenue generated from "Standard class"

- On time performance of UK trains is 86%

- Maximum delayed reason is bad weather condition

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SOFTWARE USES

- PostgreSQL

- Power BI

Thank you

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