CAR DEKHO

----------Exploratory Analysis ----------

1). Overall distribution of cars by their manufacturing year?

Query:

```
SELECT year, COUNT(*) AS num_cars
FROM Car_dekho
GROUP BY year
ORDER BY num_cars DESC;
```

Result:

year	num_cars
2017	1010
2016	856
2018	806
2015	775
2013	668

2). Selling price variation based on the number of kilometers driven?

Query:

```
SELECT
    CASE
        WHEN km_driven < 50000 THEN 'Less than 50k km'
        WHEN km_driven BETWEEN 50000 AND 100000 THEN '50k - 100k km'
        ELSE 'More than 100k km'
    END AS km_range,
    AVG(selling_price) AS avg_selling_price
FROM Car_dekho
GROUP BY km_range;
```

Result:

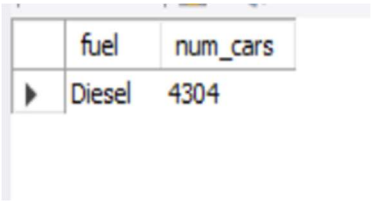
km_range	avg_selling_price
Less than 50k km	967561.3288
50k - 100k km	486789.2361
More than 100k km	416156.9095

3). Most common fuel type among the listed cars?

Query:

```
SELECT fuel, COUNT(*) AS num_cars
FROM Car_dekho
GROUP BY fuel
ORDER BY num_cars DESC
LIMIT 1;
```

Result:



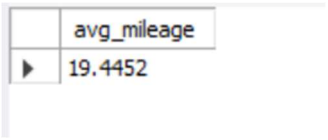
fuel	num_cars
Diesel	4304

4). Average mileage of cars?

Query:

```
SELECT AVG(CAST(REPLACE(mileage, ' kmpl', '') AS DECIMAL)) AS avg_mileage
FROM Car_dekho;
```

Result:



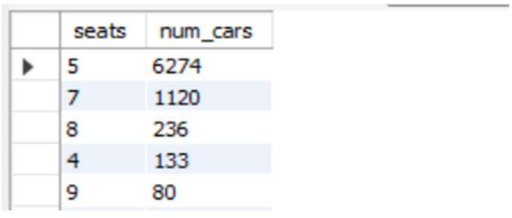
avg_mileage
19.4452

5). Distribution of cars based on the number of seats?

Query:

```
SELECT seats, COUNT(*) AS num_cars
FROM Car_dekho
GROUP BY seats
ORDER BY num_cars DESC;
```

Result:



seats	num_cars
5	6274
7	1120
8	236
4	133
9	80

6). Number of cars listed by individual sellers vs dealers?

Query:

```
SELECT seller_type, COUNT(*) AS num_cars
FROM Car_dekho
GROUP BY seller_type;
```

Result:

seller_type	num_cars
Individual	6578
Dealer	1113
Trustmark Dealer	236

CAR DEKHO

----------Price Analysis----------

1). What is the average selling price of cars for each manufacturing year?

Query:

```
SELECT year, AVG(selling_price) AS avg_selling_price
FROM car_dekho
GROUP BY year
ORDER BY year;
```

Result:

year	avg_selling_price
1994	72000.0000
1995	55000.0000
1996	41000.0000
1997	86111.0000
1998	57888.8889

2). How does the selling price vary based on different fuel types?

Query:

```
SELECT fuel, AVG(selling_price) AS avg_selling_price
FROM car_dekho
GROUP BY fuel;
```

Result:

fuel	avg_selling_price
Petrol	474468.1706
Diesel	804352.4082
Electric	2650000.0000
CNG	313415.0377
LPG	210885.7143

3). Is there a correlation between transmission type and selling price?

Query:

```
SELECT transmission, AVG(selling_price) AS avg_selling_price
FROM car_dekho
GROUP BY transmission;
```

Result:

transmission	avg_selling_price
Manual	727000.0000
Automatic	2626714.2857
Automatic	1882972.1268
Manual	462763.3692

4). What is the average selling price of cars based on the number of previous owners?

Query:

```
SELECT owner, AVG(selling_price) AS avg_selling_price
FROM car_dekho
GROUP BY owner
ORDER BY avg_selling_price DESC;
```

Result:

owner	avg_selling_price
Test Drive Car	4403800.0000
First Owner	792202.0352
Second Owner	401825.8535
Third Owner	293187.2804
Fourth & Above Owner	233196.8250

CAR DEKHO

---------- Marketing Analysis ----------

1). Evolution of Number of Cars Listed Over the Years?

Query:

```
SELECT year, COUNT(*) AS num_cars_listed
FROM car_dekho
GROUP BY year
ORDER BY num_cars_listed DESC;
```

Result:

year	num_cars_listed
2017	1010
2016	856
2018	806
2015	775
2013	668
2012	621
2014	620
2019	583
2011	570
2010	375
2009	231

2). Trend in Selling Prices Over the Years?

Query:

```
SELECT year,
       (SELECT AVG(selling_price)
        FROM car_dekho AS sub
        WHERE sub.year = main.year) AS avg_selling_price
FROM (SELECT DISTINCT year FROM car_dekho) AS main
ORDER BY year;
```

Result:

year	avg_selling_price
1994	72000.0000
1995	55000.0000
1996	41000.0000
1997	86111.0000
1998	57888.8889
1999	76928.5714
2000	76682.1250
2001	46500.0000
2002	103789.4211
2003	101572.9189
2004	109408.9216

3). Patterns in Distribution of Cars Based on Fuel Type Over Time?

Query:

```
SELECT year, fuel, num_cars
FROM (
    SELECT year, fuel, COUNT(*) AS num_cars
    FROM car_dekho
    GROUP BY year, fuel
) AS subquery
ORDER BY year, fuel;
```

Result:

year	fuel	num_cars
1994	Diesel	1
1994	Petrol	1
1995	Petrol	1
1996	Petrol	2
1997	Petrol	9
1998	Petrol	9
1999	Diesel	3
1999	Petrol	11
2000	CNG	1
2000	Diesel	3
2000	Petrol	12

4). Variation in Distribution of Cars Based on Seller Type Across Different Years?

Query:

```
SELECT year, seller_type,
       COUNT(*) OVER(PARTITION BY year, seller_type) AS num_cars
FROM car_dekho
ORDER BY year, seller_type;
```

Result:

year	seller_type	num_cars
1994	Individual	2
1994	Individual	2
1995	Individual	1
1996	Individual	2
1996	Individual	2
1997	Individual	9
1997	Individual	9
1997	Individual	9
1997	Individual	9
1997	Individual	9
1997	Individual	9

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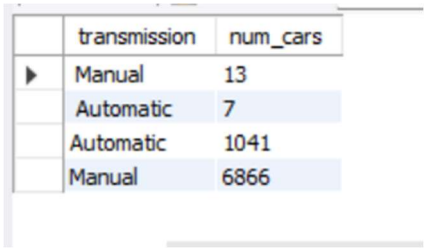
----------Customer Preference Analysis----------

1).Preferred Transmission Type Among Buyers?

Query:

```
WITH TransmissionCounts AS (
    SELECT transmission, COUNT(*) AS num_cars
    FROM car_dekho
    GROUP BY transmission
)
SELECT * FROM TransmissionCounts;
```

Result:



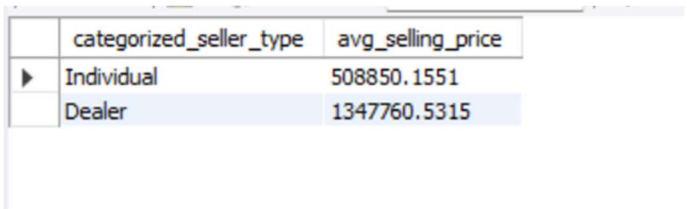
transmission	num_cars
Manual	13
Automatic	7
Automatic	1041
Manual	6866

2). Selling Price Variation Between Cars Sold by Individual Sellers vs. Dealers?

Query:

```
SELECT
    CASE
        WHEN seller_type = 'Individual' THEN 'Individual'
        ELSE 'Dealer'
    END AS categorized_seller_type,
    AVG(selling_price) AS avg_selling_price
FROM car_dekho
GROUP BY categorized_seller_type;
```

Result:



categorized_seller_type	avg_selling_price
Individual	508850.1551
Dealer	1347760.5315

3). Correlation between number of seats and selling price ?

Query:

```
SELECT seats, AVG(selling_price) AS avg_selling_price
FROM car_dekho
GROUP BY seats
ORDER BY avg_selling_price;
```

Result:

seats	avg_selling_price
14	235000.0000
10	344105.1053
4	486764.6617
9	500074.9375
6	581596.7742
8	583711.8263
5	632473.1634
2	700500.0000
7	812923.1848

4). Most Common Owner Type Among the Listed Cars?

Query:

```
SELECT owner, num_cars
FROM (
    SELECT owner, COUNT(*) AS num_cars
    FROM car_dekho
    GROUP BY owner
    ORDER BY num_cars DESC
    LIMIT 1
) AS top_owner;
```

Result:

owner	num_cars
First Owner	5232

CAR DEKHO

---------- Comparative Analysis ----------

1).Compare the average selling prices of cars with different fuel types?

Query:

```
SELECT DISTINCT fuel,
AVG(selling_price) OVER (PARTITION BY fuel) AS avg_selling_price
FROM car_dekho
ORDER BY avg_selling_price DESC;
```

Result:

fuel	avg_selling_price
Electric	2650000.0000
Diesel	804352.4082
Petrol	474468.1706
CNG	313415.0377
LPG	210885.7143

2).Compare the average mileage of cars with different engine types?

Query:

```
SELECT engine, AVG(CAST(REPLACE(mileage, ' kmpl', '') AS DECIMAL)) AS
avg_mileage
FROM car_dekho
GROUP BY engine
ORDER BY avg_mileage DESC;
```

Result:

engine	avg_mileage
793 CC	28.0000
1047 CC	26.4444
936 CC	25.0000
624 CC	24.8400
799 CC	24.5696
1186 CC	24.2459
1120 CC	24.0000
909 CC	24.0000
1498 CC	23.6507
1248 CC	23.4867
1364 CC	23.3889

CAR DEKHO

---------- Trend Forecasting ----------

1). Identifying Emerging Trends in Fuel Preferences?

Query:

```
SELECT year, fuel, COUNT(*) AS num_cars
FROM car_dekho
WHERE year >= (SELECT MAX(year) - 5 FROM car_dekho) -- Consider recent 5
years
GROUP BY year, fuel
ORDER BY year, fuel;1
```

Result:

year	fuel	num_cars
2018	CNG	5
2018	Diesel	407
2018	Petrol	394
2019	CNG	7
2019	Diesel	224
2019	Petrol	352
2020	CNG	3
2020	Diesel	20
2020	Petrol	51
2021	Diesel	2
2021	Petrol	5

2).Trend Towards Higher Selling Prices for Certain Car Models Over Time?

Query:

```
SELECT name, year, ROUND(AVG(selling_price),2) AS avg_selling_price
FROM car_dekho
GROUP BY name, year
ORDER BY name, year;
```

Result:

name	year	avg_selling_price
BMW 3 Series Gran Limousine 320Ld Luxury Line	2023	5800000.00
Hyundai Creta SX Diesel AT	2021	1950000.00
Hyundai Creta SX Turbo	2022	1895000.00
Hyundai i20 Sportz Diesel	2021	977000.00
Hyundai Tucson Platinum AT	2021	2975000.00
Mahindra XUV300 W8 Diesel Sunroof	2022	1197000.00
Mahindra XUV700 AX5 Diesel AT	2022	2275000.00
Maruti Alto 800 LXI Opt	2021	358000.00
Maruti Alto 800 LXI Opt	2023	410000.00
Maruti S-Presso LXi	2022	425000.00
Maruti S-Presso VXi Plus	2023	450000.00

3). Predicting Future Demand for Cars?

Query:

```
WITH yearly_sales AS (
    SELECT year, COUNT(*) AS num_cars
    FROM car_dekho
    GROUP BY year
)
SELECT
    year,
    num_cars,
    LAG(num_cars) OVER (ORDER BY year) AS prev_year_sales,
    (num_cars - LAG(num_cars) OVER (ORDER BY year)) / LAG(num_cars) OVER
(ORDER BY year) AS yoy_growth_rate
FROM yearly_sales;
```

Result:

year	num_cars	prev_year_sales	yoy_growth_rate
1994	2	NULL	NULL
1995	1	2	-0.5000
1996	2	1	1.0000
1997	9	2	3.5000
1998	9	9	0.0000
1999	14	9	0.5556
2000	16	14	0.1429
2001	6	16	-0.6250
2002	19	6	2.1667
2003	37	19	0.9474
2004	51	37	0.3784