SQL DATA ANALYSIS PROJECT FOR LAPTOPS

Analyzing Market Trends, Performance, and Brand Comparisons

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OBJECTIVE:

To gain insights into market trends, performance metrics, and brand comparisons using single-relation-based SQL queries.

OVERVIEW:

This project focuses on analyzing a comprehensive dataset of laptop specifications, prices, ratings, and reviews using SQL. The objective is to gain valuable insights into market trends, performance metrics, and brand comparisons. By executing various SQL queries, we aim to uncover patterns and relationships within the data that can inform decision-making processes and provide a deeper understanding of the laptop market.

This project not only highlights the power of SQL in data manipulation and analysis but also demonstrates the importance of visual tools in interpreting complex datasets.

KEY AREAS OF ANALYSIS

- PRICE ANALYSIS
- RATING AND REVIEW ANALYSIS
- PERFORMANCE, GRAPHICS CARD, DISPLAY AND STORAGE ANALYSIS
- TRENDS AND PATTERNS

DATA DESCRIPTION

- **DATA SOURCE**

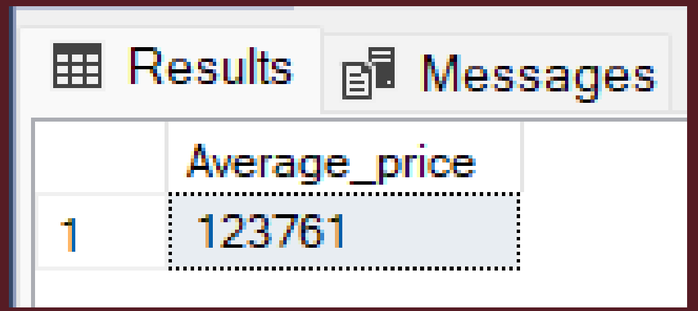
  DATA WAS OBTAINED FROM KAGGLE

  https://www.kaggle.com/datasets/sujalbajracharya/daraz-laptop-and-prices-data-2024

SQL QUERIES :

01 WHAT IS THE AVERAGE PRICE OF DEVICES IN THE DATASET?

```
SELECT
    AVG(price) AS Average_price
FROM
    laptop;
```



02

HOW DOES THE PRICE VARY ACROSS DIFFERENT BRANDS?

```
SELECT
    brand,
    AVG(price) AS average_price
FROM
    laptop
GROUP BY
    brand
ORDER BY
    average_price DESC;
```

Results | Messages

	brand	average_price
1	apple	281903
2	razer	260900
3	microsoft	246598
4	gigabyte	237490
5	level51	220000
6	nova	195000
7	dynabook	174466
8	asus	156982
9	msi	156709
10	gateway	151932
11	huawei	109990

03

IS THERE A CORRELATION BETWEEN PRICE AND PROCESSOR TYPE?

```sql
SELECT
    processor,
    AVG(price) AS average_price
FROM
    laptop
GROUP BY
    processor
ORDER BY
    average_price DESC;
```

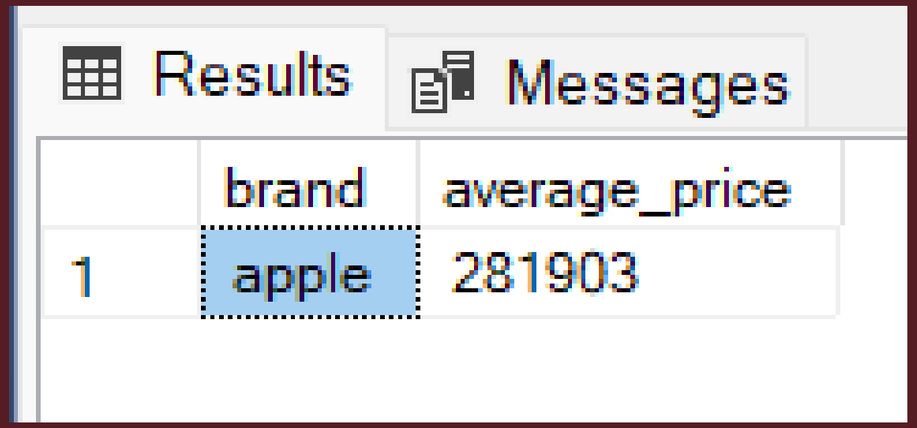
Results | Messages

	processor	average_price
1	6.5	347925
2	9	296294
3	7.5	237340
4	8.5	225780
5	7	168372
6	5	97503
7	3	64569
8	2	42535

04

WHICH BRAND HAS THE HIGHEST AVERAGE PRICE?

```sql
SELECT TOP 1
    brand,
    AVG(price) AS average_price
FROM
    laptop
GROUP BY
    brand
ORDER BY
    average_price DESC;
```



	brand	average_price
1	apple	281903

05

WHICH BRAND OFFERS THE MOST DEVICES WITH HIGH-END SPECIFICATIONS?

```sql
SELECT
    brand,
    model,
    price,
    processor,
    ram_memory,
    storage_capacity,
    cpu_cores,
    graphics_card
FROM
    laptop
WHERE
    ram_memory >= 16
    AND cpu_cores >= 8
    AND graphics_card IS NOT NULL
ORDER BY
    price;
```

Results | Messages

	brand	model	price	processor	ram_memory	storage_capacity	cpu_cores	graphics_card
1	asus	Expertbook With	49999	7	32	1024	8	1000
2	lenovo	V15 With	55499	7	16	512	8	2000
3	lenovo	ThinkPad L13	61198	5	16	512	10	2800
4	dell	Vostro 3520	64999	5	16	256	10	1000
5	lenovo	Ideapad Slim	65999	5	16	512	8	1000
6	dell	Vostro 3520	66999	5	16	256	10	2800
7	lenovo	Ideapad Slim	68490	5	16	512	10	1000
8	dell	Vostro 3520	68999	5	16	512	10	1000
9	dell	Vostro 3520	69490	5	16	512	10	2800
10	dell	Vostro 3520	69999	5	16	512	10	2800
11	dell	Inspiron 3520	69999	5	16	512	10	1000
12	asus	Ga401Q Zephyrus	71111	7	16	512	8	1650

06

HOW DOES THE NUMBER OF CPU CORES AFFECT THE PRICE?

```
SELECT
    cpu_cores,
    AVG(price) AS average_price
FROM
    laptop
GROUP BY
    cpu_cores
ORDER BY
    cpu_cores DESC;
```

Results | Messages

	cpu_cores	average_price
1	24	374459
2	20	203000
3	16	196833
4	14	230195
5	12	153063
6	10	132601
7	8	157636
8	6	106056
9	5	61750
10	4	98966
11	2	57813
12	1	137036

07

IS THERE A RELATIONSHIP BETWEEN RAM MEMORY AND THE PROCESSOR TYPE?

```
SELECT
    processor,
    MAX(ram_memory) AS max_ram,
    MIN(ram_memory) AS min_ram,
    COUNT(*) AS device_count
FROM
    laptop
GROUP BY
    processor
ORDER BY
    max_ram DESC;
```

Results | Messages

	processor	max_ram	min_ram	device_count
1	6.5	32	8	11
2	7	32	8	518
3	9	32	8	43
4	5	32	4	747
5	7.5	24	8	10
6	3	16	4	166
7	2	12	4	64
8	8.5	8	8	5

08

WHAT IS THE AVERAGE DISPLAY SIZE ACROSS DIFFERENT MODELS?

```sql
SELECT
    model,
    ROUND(AVG(display_size), 2) AS average_display_size
FROM
    laptop
GROUP BY
    model
ORDER BY
    average_display_size DESC;
```

Results | Messages

	model	average_display_size
1	GE76 Raider	17.3
2	GL75 Leopard	17.3
3	Leopard GP76	17.3
4	zenbook 17	17.3
5	Nitro16 (AN16	16
6	Omen 16	16
7	Inspiron 5625	16
8	AERO 16	16
9	Victus 16	15.98
10	Inspiron 16	15.94
11	LEGION PRO	15.9
12	Nitro 16	15.8
13	ROG Strix	15.79
14	Predator Helios	15.67
15	Legion 5	15.62
16	Legion 5i	15.6
17	Inspiron 15	15.6

09

HOW DOES STORAGE CAPACITY AFFECT THE DEVICE'S PRICE?

```sql
SELECT
    storage_capacity,
    AVG(price) AS average_price
FROM
    laptop
GROUP BY
    storage_capacity
ORDER BY
    average_price DESC;
```

Results | Messages

	storage_capacity	average_price
1	1024	176882
2	2048	172999
3	512	124710
4	256	85053
5	128	77456
6	64	37749

10

WHICH BRANDS OFFER THE MOST DEVICES WITH DEDICATED GRAPHICS CARDS?

```sql
SELECT TOP 10
    brand,
    COUNT(*) AS Device_count
FROM
    laptop
WHERE
    graphics_card IS NOT NULL
GROUP BY
    brand
ORDER BY
    Device_count DESC;
```

Results | Messages

	brand	Device_count
1	dell	335
2	acer	327
3	asus	322
4	lenovo	254
5	hp	176
6	msi	79
7	apple	26
8	avita	9
9	mi	6
10	microsoft	5

11

HOW DOES THE PRESENCE OF A GRAPHICS CARD IMPACT THE OVERALL PRICE OF THE DEVICE?

```
SELECT
    graphics_card,
    AVG(price) AS average_price
FROM
    laptop
GROUP BY
    graphics_card
ORDER BY
    average_price DESC;
```

Results | Messages

	graphics_card	average_price
1	2500	347925
2	4070	337194
3	2070	288256
4	3070	264152
5	2900	218966
6	4060	217120
7	3060	204466
8	2060	191666
9	1660	174891
10	4050	172951
11	3050	149835
12	1400	148248
13	1650	124341
14	2800	123685
15	2040	120000
16	2050	118326

12 WHAT ARE THE MOST COMMON SPECIFICATIONS AMONG THE HIGHEST-PRICED DEVICES?

```sql
SELECT
    processor,
    MAX(ram_memory) AS max_ram,
    MIN(ram_memory) AS min_ram,
    round(MAX(display_size),3) AS max_display_size,
    round(MIN(display_size),3) AS min_display_size,
    MAX(cpu_cores) AS max_cpu_cores,
    MIN(cpu_cores) AS min_cpu_cores
FROM
    (SELECT top 50
        processor,
        ram_memory,
        display_size,
        storage_capacity,
        cpu_cores
    FROM
        laptop
    ORDER BY
        price DESC) AS top_devices
GROUP BY
    processor;
```

Results | Messages

	processor	max_ram	min_ram	max_display_size	min_display_size	max_cpu_cores	min_cpu_cores
1	5	16	16	13.3	13.3	4	4
2	6.5	32	16	16.2	14	10	6
3	7	32	8	17.3	13.3	14	1
4	7.5	24	24	13.3	13.3	8	8
5	9	32	16	17.3	14.1	24	8

13

WHAT IS THE RATING VARIATION ACROSS DIFFERENT BRANDS?

```sql
SELECT
    brand,
    ROUND(AVG(rating), 1) AS average_rating
FROM
    laptop
WHERE
    rating != 0
GROUP BY
    brand
ORDER BY
    average_rating DESC;
```

Results | Messages

	brand	average_rating
1	honor	5
2	mi	5
3	avita	4.8
4	acer	4.6
5	asus	4.6
6	apple	4.5
7	hp	4.4
8	dell	4.3
9	gateway	4
10	lenovo	4
11	chuwi	2.8

14

IS THERE A CORRELATION BETWEEN PRICE AND RATING ?

```sql
SELECT
    ROUND(rating, 1) AS Rating,
    AVG(price) AS average_price
FROM
    laptop
WHERE
    rating != 0
GROUP BY
    rating
ORDER BY
    rating DESC;
```

Results | Messages

	Rating	average_price
1	5	84131
2	4.8	107800
3	4.7	74626
4	4.6	60749
5	4.5	60195
6	4.4	33999
7	4.3	106133
8	4.2	52999
9	4	90014
10	3.7	39999
11	3.5	96494
12	3.3	31249
13	3	87097
14	2	99999
15	1	58575

15

WHICH ARE THE TOP BRANDS BASED ON THE AVERAGE RATING WITH TOTAL NUMBER OF REVIEWS FOR EACH BRAND ?

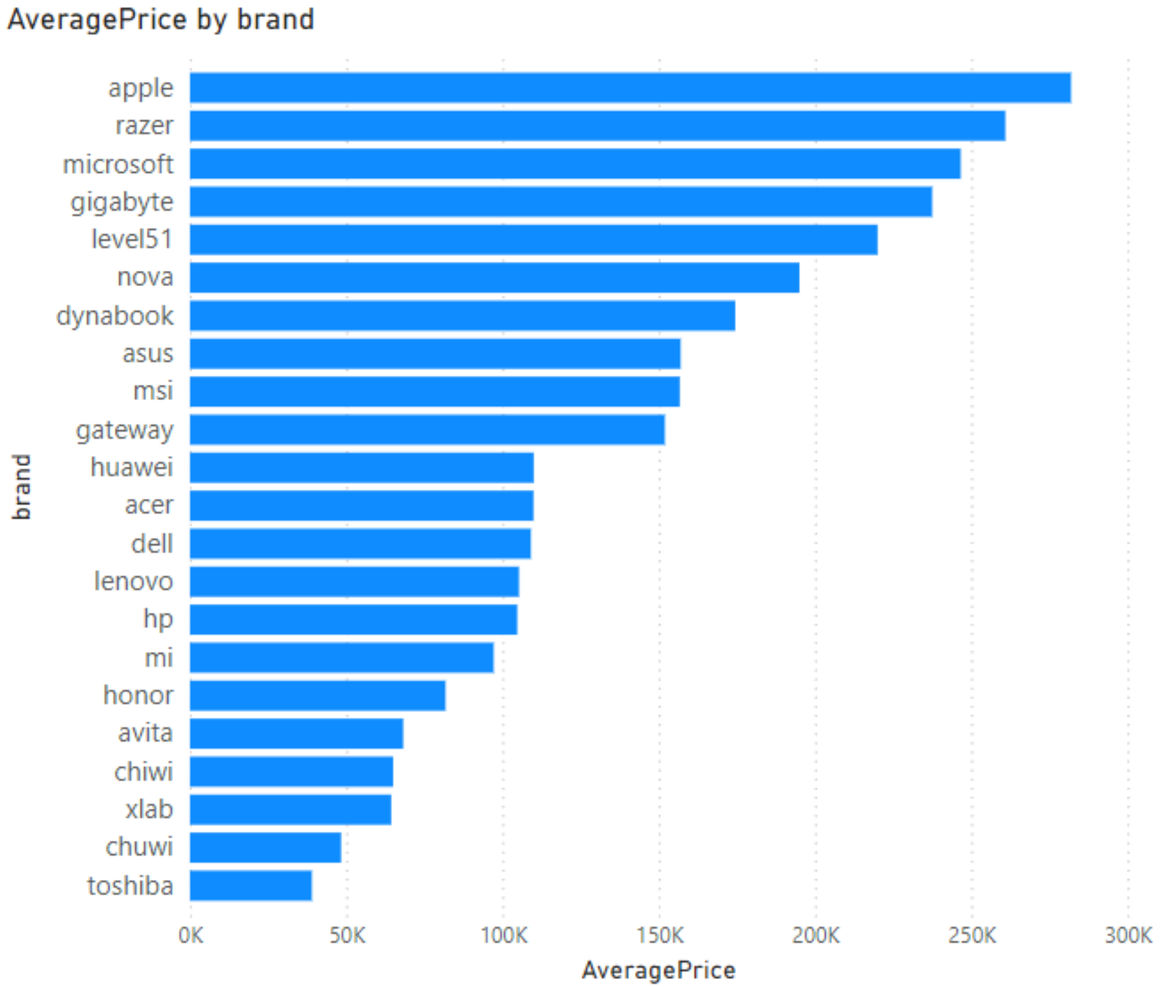
```sql
SELECT TOP 10
    brand,
    SUM(reviews) AS total_reviews,
    ROUND(AVG(rating), 1) AS Rating
FROM
    laptop
WHERE
    reviews != 0
    AND rating != 0
GROUP BY
    brand
ORDER BY
    total_reviews DESC;
```

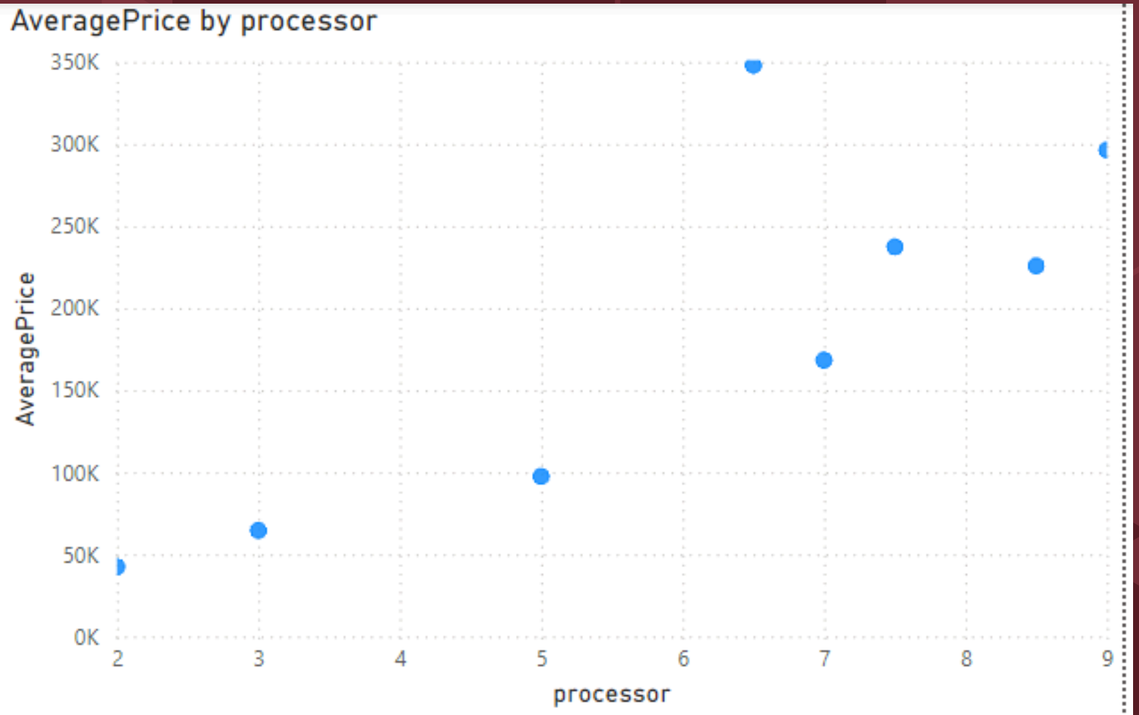
Results | Messages

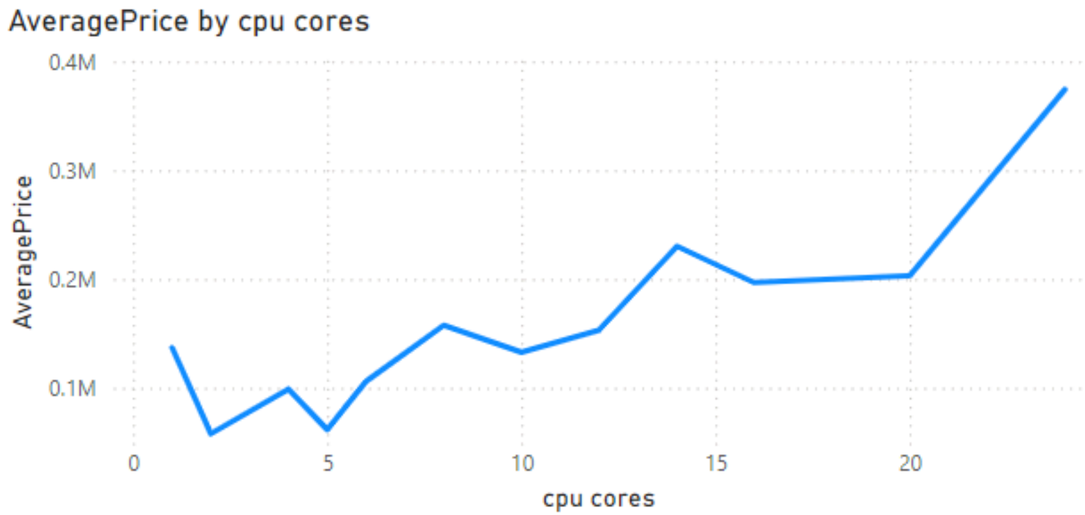
	brand	total_reviews	Rating
1	apple	92	4.5
2	dell	84	4.3
3	hp	52	4.4
4	lenovo	50	4
5	acer	37	4.6
6	asus	24	4.6
7	mi	5	5
8	avita	4	4.8
9	chuwi	3	2.8
10	honor	1	5

SIMPLE DASHBOARDS :

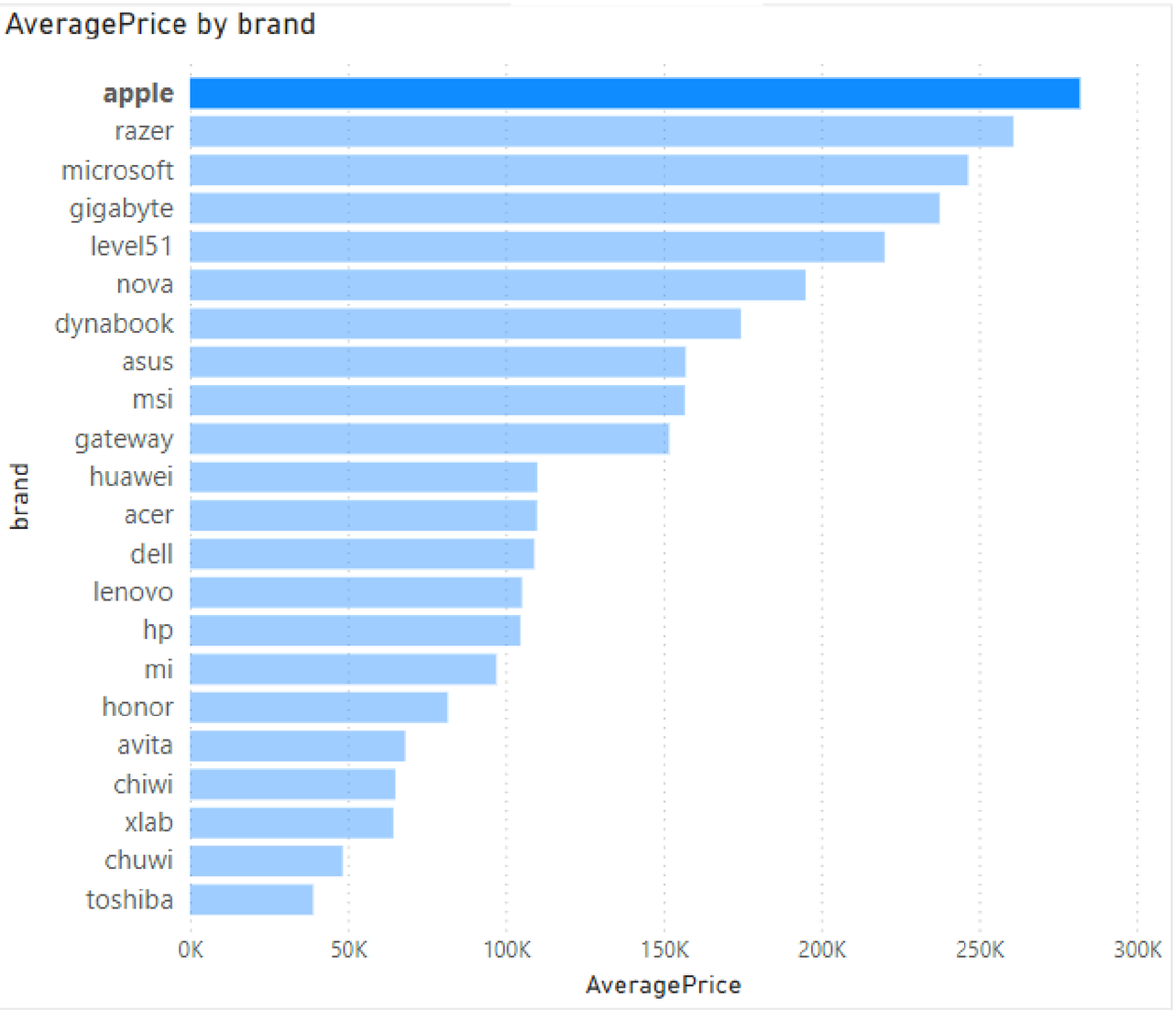
1564	2048	64	32	4
Total_Devices	Max_Storage	Min_Storage	Max_Ram	Min_Ram

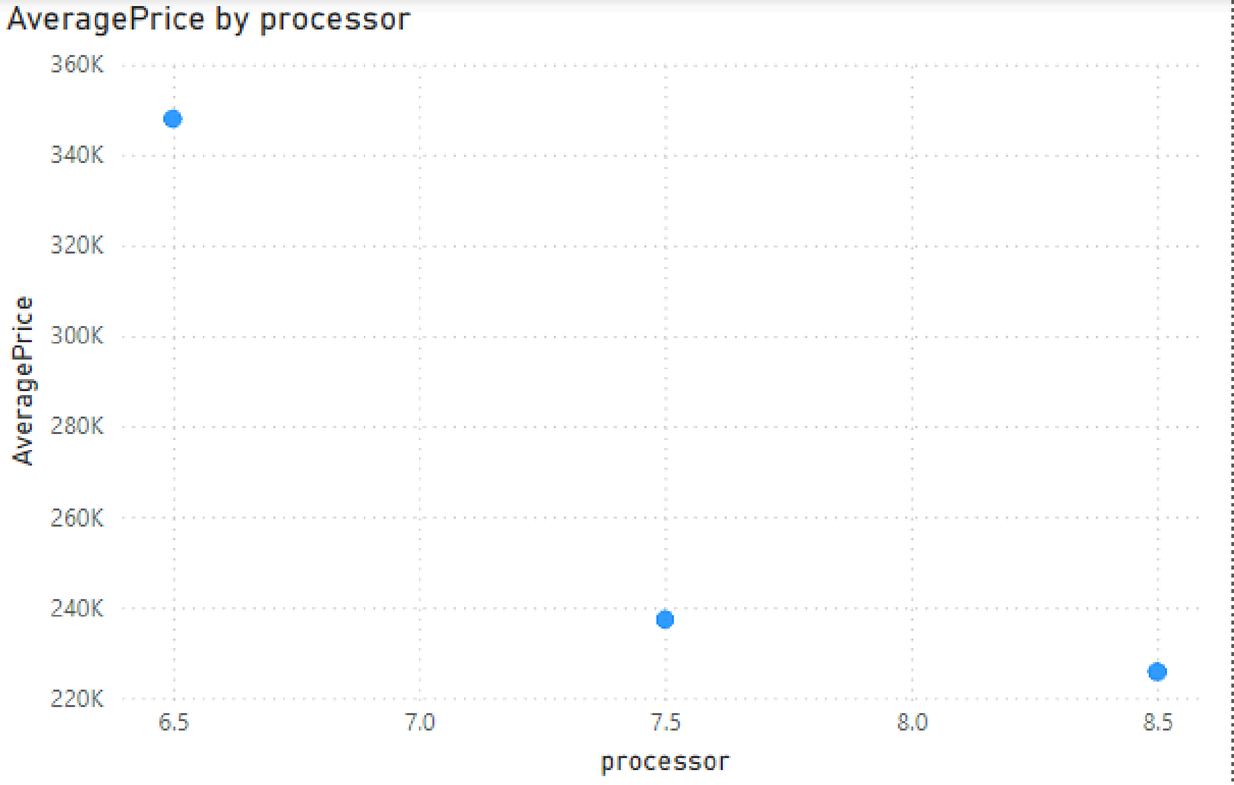


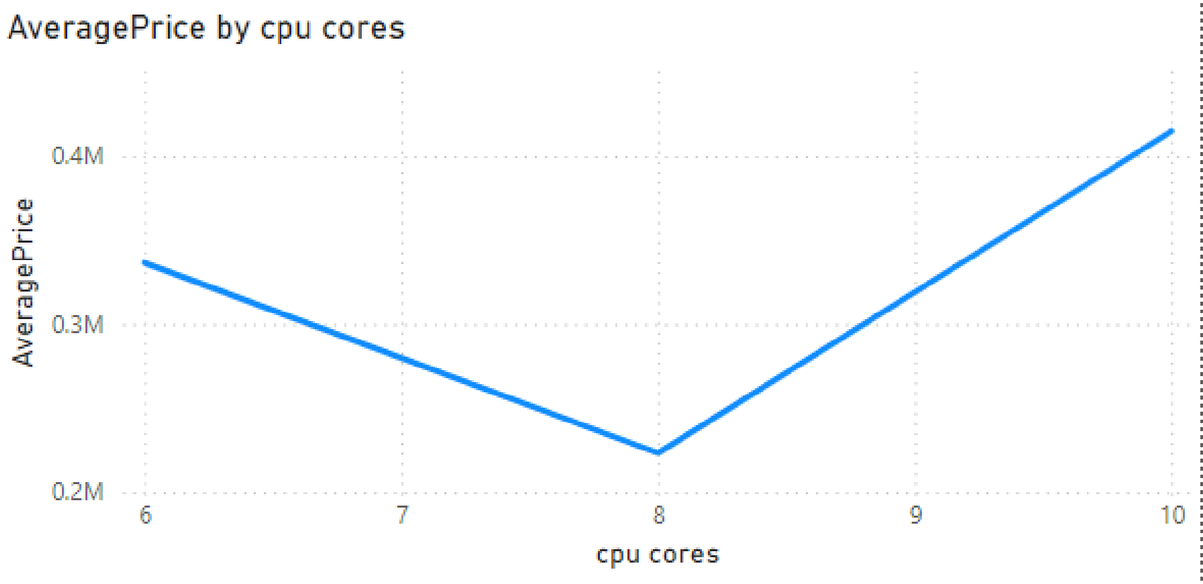




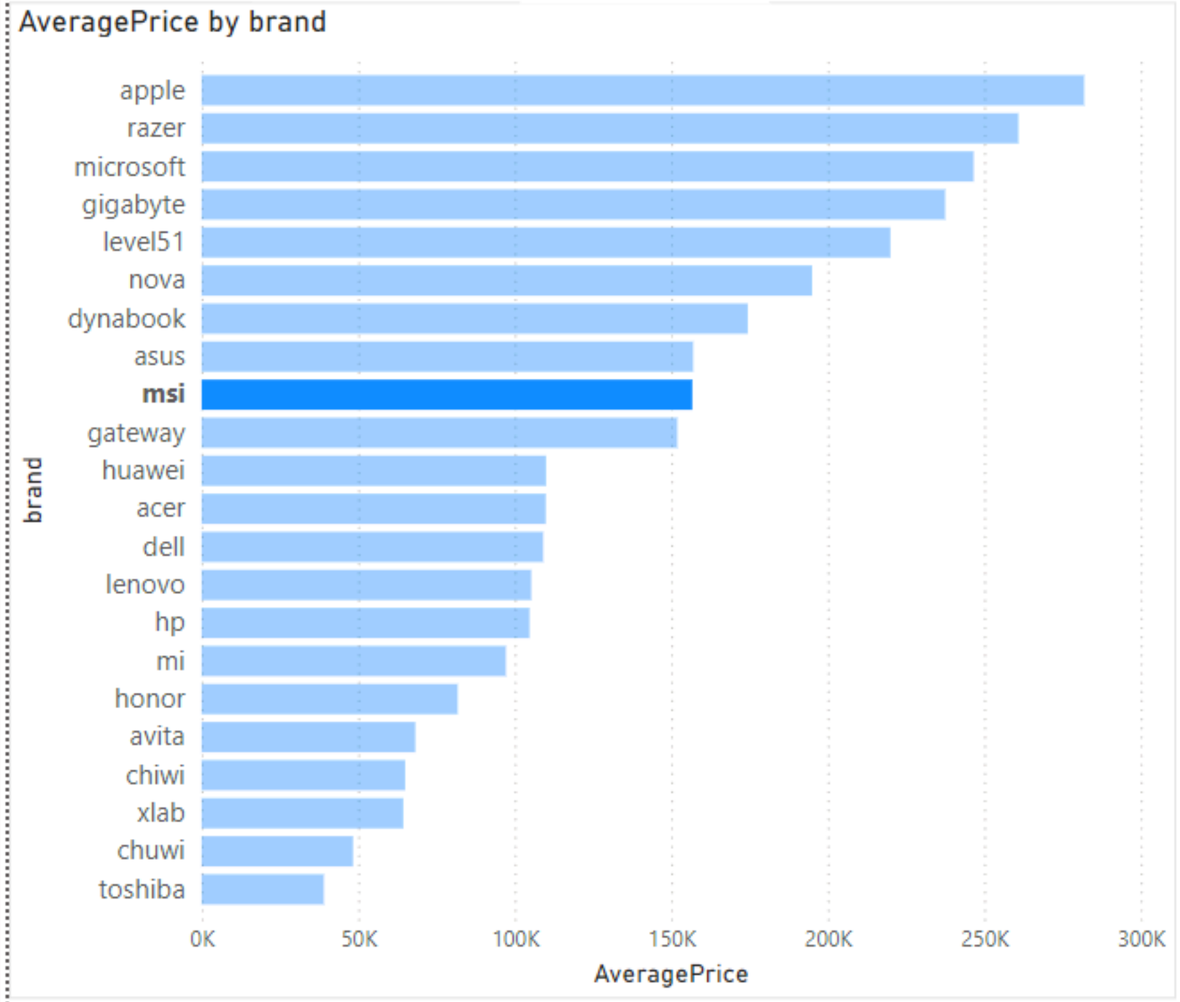
26	1024	256	32	8
Total_Devices	Max_Storage	Min_Storage	Max_Ram	Min_Ram

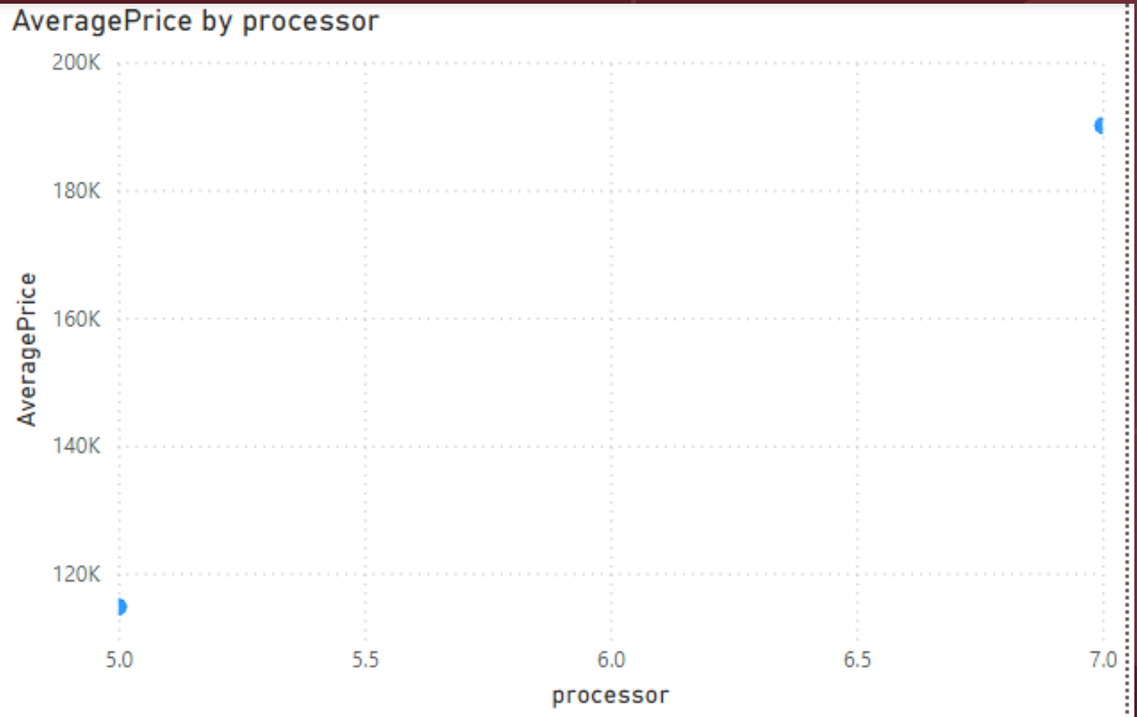


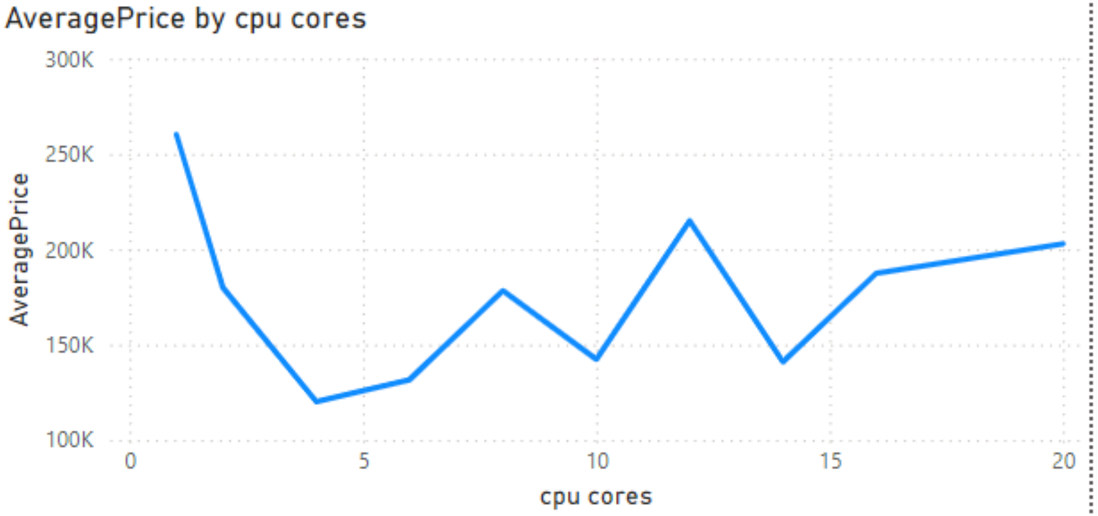




79	2048	256	32	8
Total_Devices	Max_Storage	Min_Storage	Max_Ram	Min_Ram







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KEY FINDINGS:

- **SUMMARY OF INSIGHTS:**
  - AVERAGE PRICING: SIGNIFICANT PRICE VARIATION ACROSS BRANDS.
  - RATINGS AND REVIEWS: HONOR AND MI HAS THE HIGHEST AVERAGE RATING.
  - PERFORMANCE IMPACT: HIGHER SPECS LIKE CPU CORES AND RAM INCREASE PRICES.
- **MARKET TRENDS:**
  - PRICE TRENDS: HIGH-END LAPTOPS ARE BECOMING MORE EXPENSIVE.
  - POPULAR SPECS: HIGH-RESOLUTION DISPLAYS AND POWERFUL GRAPHICS CARDS ARE TRENDING.
- **BRAND COMPARISONS:**
  - VALUE FOR MONEY: ASUS OFFERS GREAT VALUE.
  - HIGH-END DEVICES: APPLE LEADS IN PREMIUM MODELS.
- **VISUALS:**
  - BAR CHARTS, SCATTER PLOTS, AND LINE CHARTS.

CONCLUSION

- **OVERALL SUMMARY:**
  THE ANALYSIS PROVIDED INSIGHTS INTO PRICES, RATINGS, AND SPECIFICATIONS USING SQL AND POWER BI.
- **ACTIONABLE INSIGHTS:**
  - FOR CONSUMERS: HELPS IN MAKING INFORMED PURCHASING DECISIONS.
  - FOR MANUFACTURERS: GUIDES IN UNDERSTANDING CONSUMER PREFERENCES.

THANK YOU