ANALYZING RESTAURANT ORDERS WITH SQL

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CASE STUDY

This project analyzes a restaurant order data to uncover key insights.
It includes two tables: orders and menu.
The orders table contains three months of transaction data (from January 1, 2023, to March 31, 2023), while the menu table holds details of menu items.

Tables Included:
Orders Table: order_details_id, order_id, order_date, order_time, item_id
Menu Table: menu_item_id, item_name, category, price

OBJECTIVES

- To extract meaningful insights from restaurant order data using SQL queries.
- To analyze order trends, popular dishes and peak ordering times.
- To help the restaurant make data-driven decisions for menu optimization and better services.

What is the average dish price within each category?

Input :

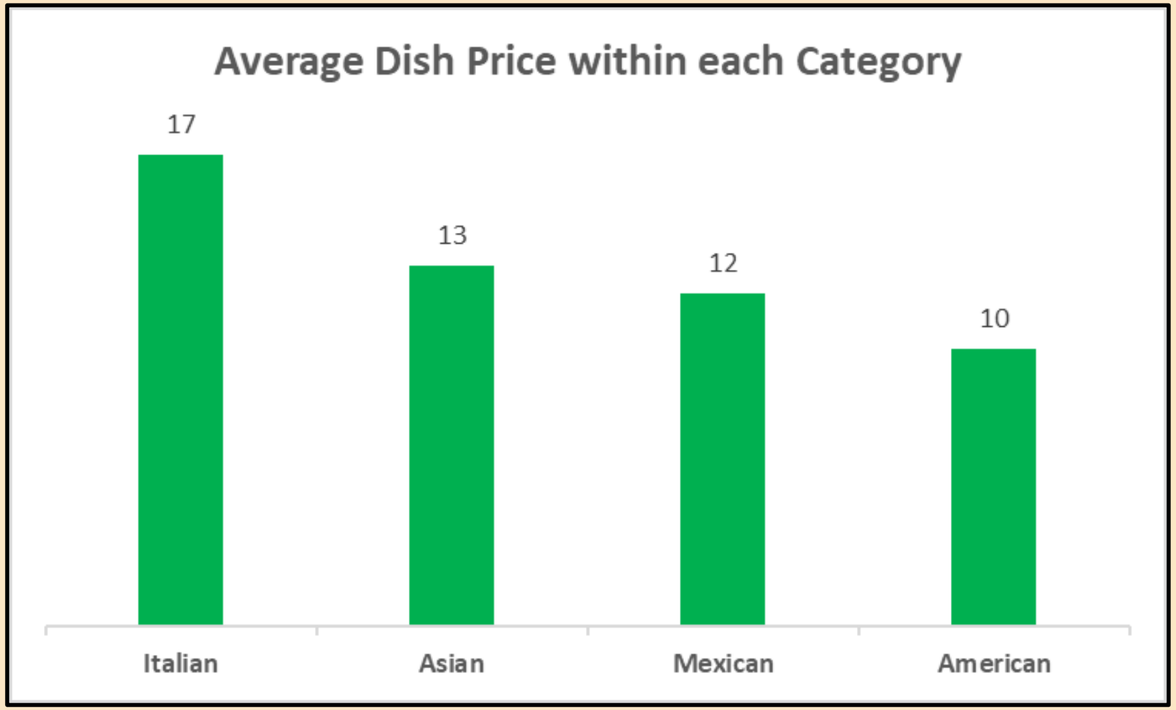
```
select category,round(avg(price)) AvgPrice
from menu
group by category
order by AvgPrice desc;
```

Output :

category	AvgPrice
Italian	17
Asian	13
Mexican	12
American	10

DATA INSIGHTS & FINDINGS:

1. The average price of dishes varies by category.



What are the most and least ordered dishes/items?

Input :

```
select distinct m.item_name,m.category,
count(o.order_details_id) over (partition by m.item_name,m.category) as NumberOfOrders
from orders o inner join menu m on o.item_id=m.menu_item_id
order by NumberOfOrders desc ;
```

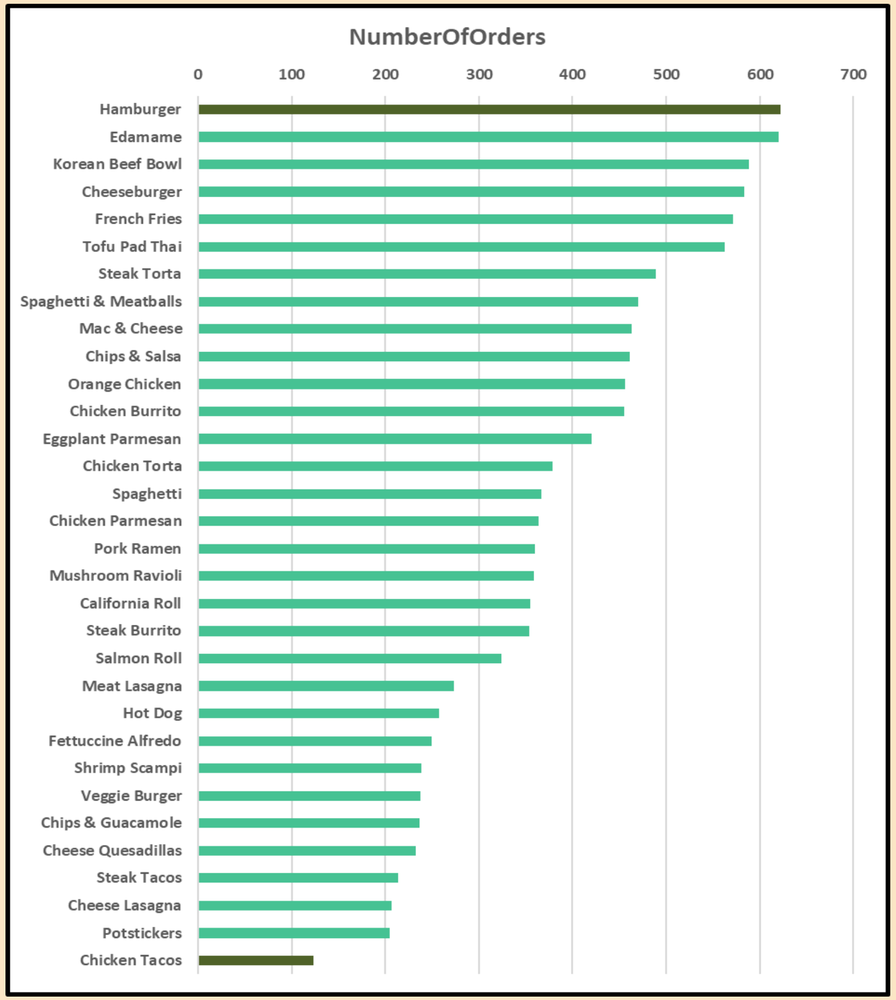
Output :

item_name	category	NumberOfOrders
Hamburger	American	622
Edamame	Asian	620
Korean Beef Bowl	Asian	588
Cheeseburger	American	583
French Fries	American	571
Tofu Pad Thai	Asian	562
Steak Torta	Mexican	489
Spaghetti & Meatballs	Italian	470
Mac & Cheese	American	463
Chips & Salsa	Mexican	461
Orange Chicken	Asian	456
Chicken Burrito	Mexican	455
Eggplant Parmesan	Italian	420
Chicken Torta	Mexican	379
Spaghetti	Italian	367
Chicken Parmesan	Italian	364
Pork Ramen	Asian	360
Mushroom Ravioli	Italian	359
California Roll	Asian	355
Steak Burrito	Mexican	354
Salmon Roll	Asian	324
Meat Lasagna	Italian	273
Hot Dog	American	257
Fettuccine Alfredo	Italian	249
Shrimp Scampi	Italian	239
Veggie Burger	American	238
Chips & Guacamole	Mexican	237
Cheese Quesadillas	Mexican	233
Steak Tacos	Mexican	214
Cheese Lasagna	Italian	207
Potstickers	Asian	205
Chicken Tacos	Mexican	123

DATA INSIGHTS & FINDINGS:

2. Most & least ordered dishes indicate customer preferences.

- Identifying the most and least ordered dishes helps refine the menu.
- Unpopular dishes can be replaced, improved or promoted through discounts or marketing efforts.



Which items on the menu are the most and least expensive?

Input :

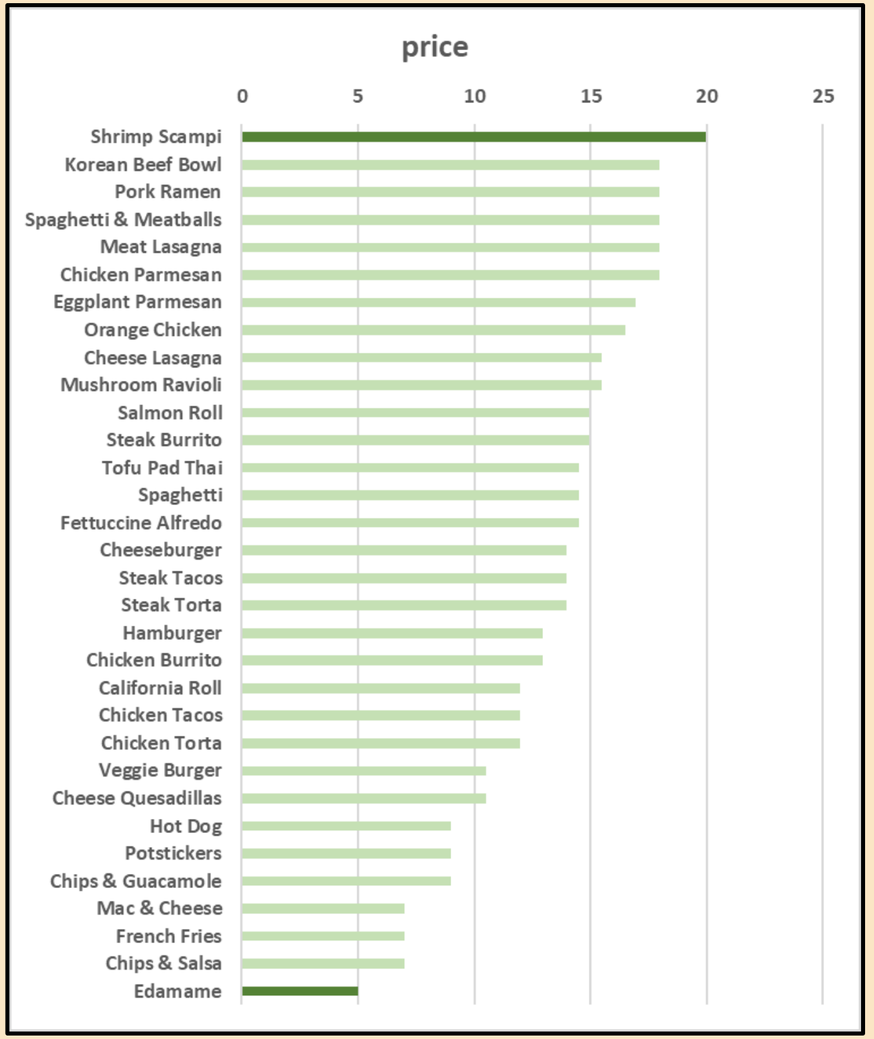
```
select item_name,category,price
from menu
order by price desc;
```

Output :

item_name	category	price
Shrimp Scampi	Italian	19.95
Korean Beef Bowl	Asian	17.95
Pork Ramen	Asian	17.95
Spaghetti & Meatballs	Italian	17.95
Meat Lasagna	Italian	17.95
Chicken Parmesan	Italian	17.95
Eggplant Parmesan	Italian	16.95
Orange Chicken	Asian	16.5
Cheese Lasagna	Italian	15.5
Mushroom Ravioli	Italian	15.5
Salmon Roll	Asian	14.95
Steak Burrito	Mexican	14.95
Tofu Pad Thai	Asian	14.5
Spaghetti	Italian	14.5
Fettuccine Alfredo	Italian	14.5
Cheeseburger	American	13.95
Steak Tacos	Mexican	13.95
Steak Torta	Mexican	13.95
Hamburger	American	12.95
Chicken Burrito	Mexican	12.95
California Roll	Asian	11.95
Chicken Tacos	Mexican	11.95
Chicken Torta	Mexican	11.95
Veggie Burger	American	10.5
Cheese Quesadillas	Mexican	10.5
Hot Dog	American	9
Potstickers	Asian	9
Chips & Guacamole	Mexican	9
Mac & Cheese	American	7
French Fries	American	7
Chips & Salsa	Mexican	7
Edamame	Asian	5

DATA INSIGHTS & FINDINGS:

3. The most expensive and cheapest menu items were identified.



What is the peak order time period (morning, afternoon or evening)?

Input :

```
select TimeOfTheDay,count(distinct order_id) NumberOfOrders
from orders
group by TimeOfTheDay
order by NumberOfOrders desc ;
```

Output :

TimeOfTheDay	NumberOfOrders
Evening	3683
Morning	1041
Afternoon	646

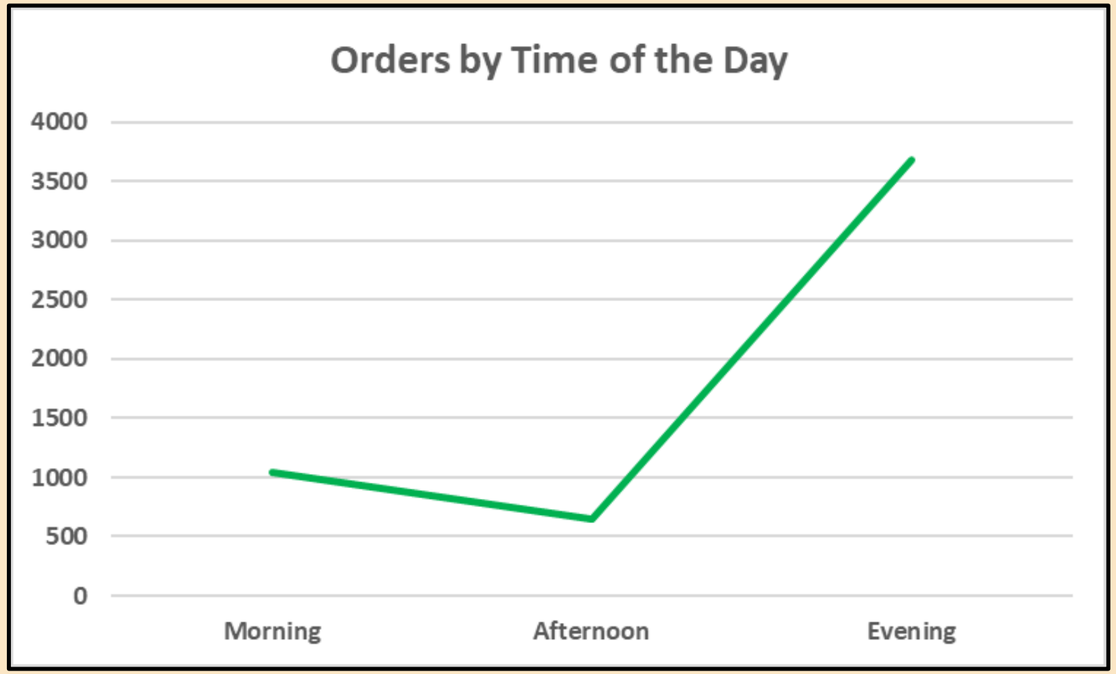
Where:

TimeOfTheDay	Time Range
Morning	00:00:00 to 12:00:00
Afternoon	12:00:01 to 17:00:00
Evening	17:00:01 to 23:59:59

DATA INSIGHTS & FINDINGS:

4. Peak ordering time was found to be Evening.

- Evening is the peak ordering time, indicating the need for more staff, faster service and optimized kitchen operations during this period.
- Special promotions and happy hour deals can be introduced to maximize evening sales.



Which dishes have the highest number of orders during the peak time period?

Input :

```sql
With PeakTime as (
    select TimeOfTheDay, count(distinct order_id) NumberOfOrders
    from orders
    group by TimeOfTheDay
    order by NumberOfOrders Desc
    limit 1
)
select m.item_name, m.category, count(distinct order_id) NumberOfOrders
from orders o inner join menu m on o.item_id = m.menu_item_id inner join PeakTime p on o.TimeOfTheDay = p.TimeOfTheDay
group by m.item_name, m.category
order by NumberOfOrders Desc;
```

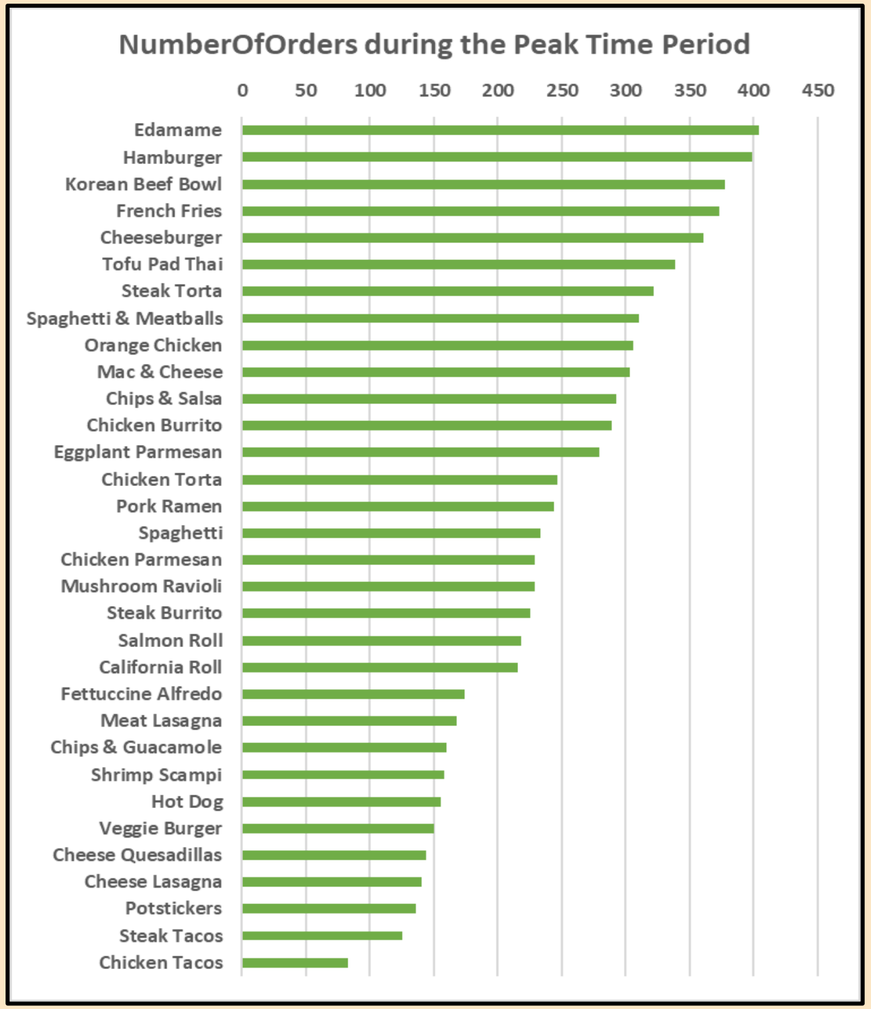
Output :

item_name	category	NumberOfOrders
Edamame	Asian	404
Hamburger	American	399
Korean Beef Bowl	Asian	378
French Fries	American	373
Cheeseburger	American	361
Tofu Pad Thai	Asian	339
Steak Torta	Mexican	322
Spaghetti & Meatballs	Italian	310
Orange Chicken	Asian	306
Mac & Cheese	American	303
Chips & Salsa	Mexican	293
Chicken Burrito	Mexican	289
Eggplant Parmesan	Italian	279
Chicken Torta	Mexican	247
Pork Ramen	Asian	244
Spaghetti	Italian	233
Chicken Parmesan	Italian	229
Mushroom Ravioli	Italian	229
Steak Burrito	Mexican	225
Salmon Roll	Asian	218
California Roll	Asian	216
Fettuccine Alfredo	Italian	174
Meat Lasagna	Italian	168
Chips & Guacamole	Mexican	160
Shrimp Scampi	Italian	158
Hot Dog	American	155
Veggie Burger	American	150
Cheese Quesadillas	Mexican	144
Cheese Lasagna	Italian	140
Potstickers	Asian	136
Steak Tacos	Mexican	125
Chicken Tacos	Mexican	83

DATA INSIGHTS & FINDINGS:

5. Most ordered dishes during peak hours were identified.

- Identifying top-selling dishes during peak hours allows the restaurant to prioritize inventory and preparation.



Which day of the week has the highest number of orders?

Input :

```
select Day_Name,count(distinct order_id)  NumberOfOrders
from orders
group by Day_Name
order by NumberOfOrders desc ;
```

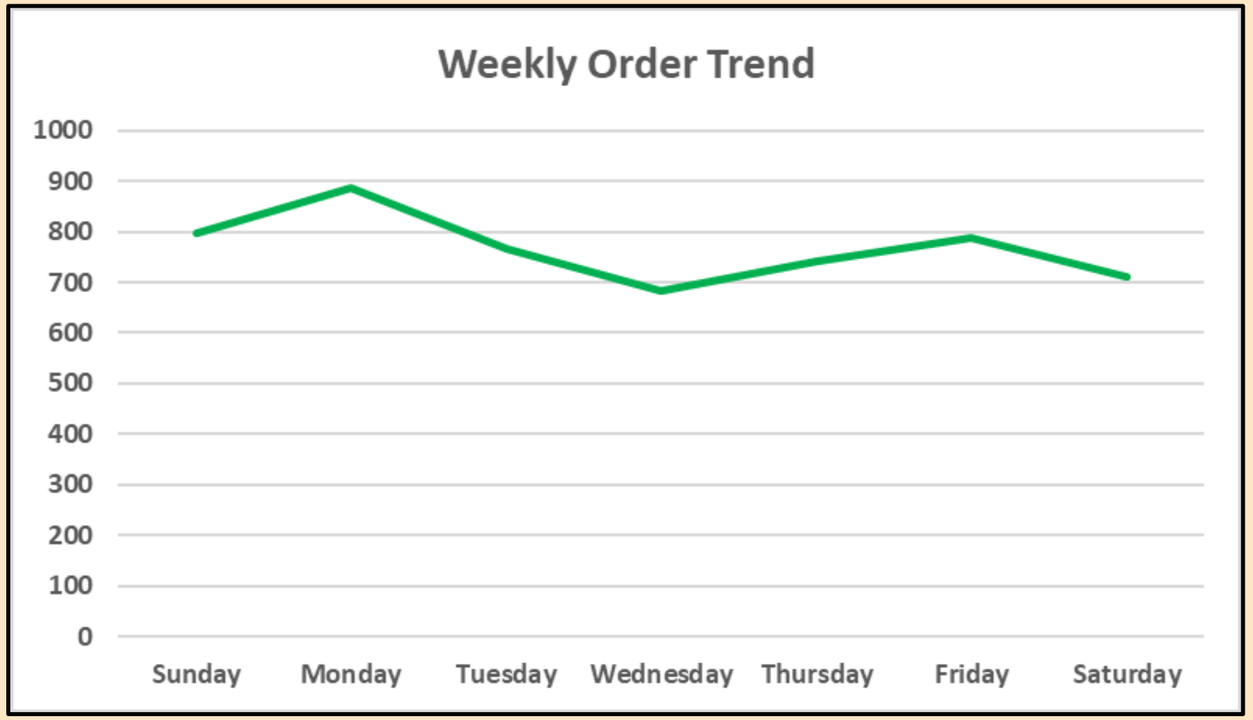
Output :

Day_Name	NumberOfOrders
Monday	885
Sunday	796
Friday	787
Tuesday	766
Thursday	743
Saturday	711
Wednesday	682

DATA INSIGHTS & FINDINGS:

6. Highest order volume day of the week was analyzed.

- Analyzing the highest order volume day of the week helps in special event planning, discounts or theme nights to further boost sales.



What are the top five highest-value orders?

Input :

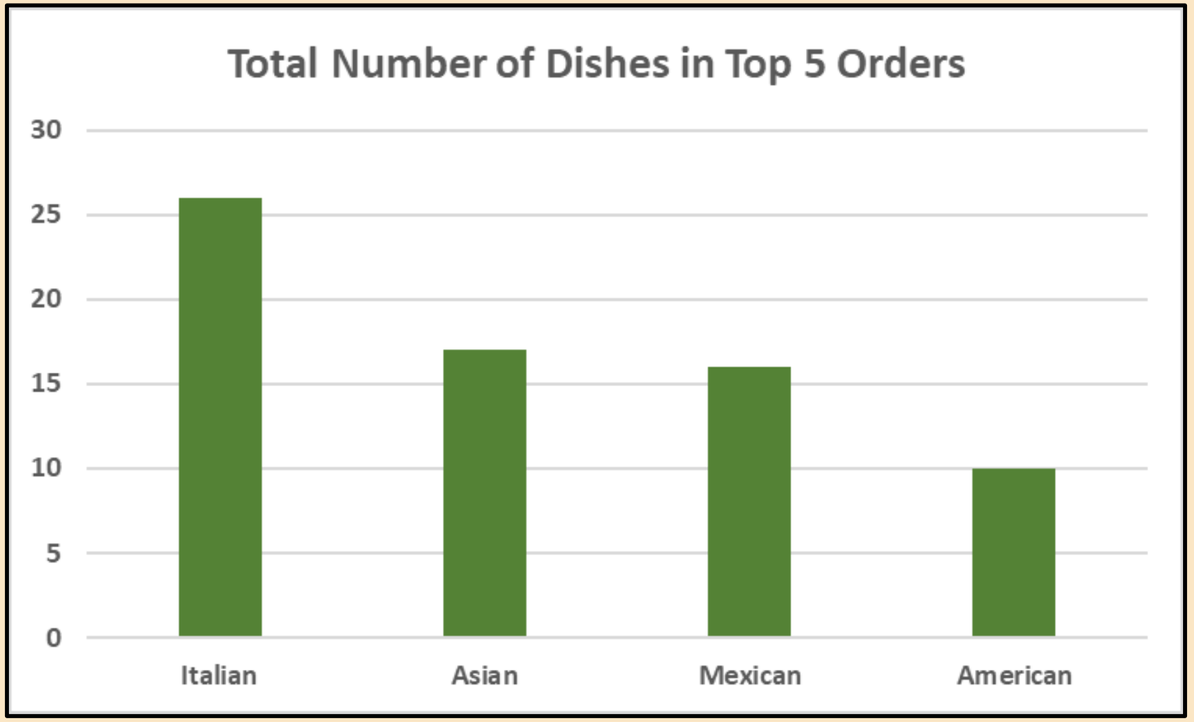
```
select order_id,round(sum(price)) TotalOrderPrice
from orders o inner join menu m on o.item_id=m.menu_item_id
group by order_id
order by TotalOrderPrice desc
limit 5;
```

Output :

order_id	TotalOrderPrice
440	192
2075	191
330	190
1957	190
2675	185

DATA INSIGHTS & FINDINGS:

7. Top five highest-value orders were identified .



What is the total dishes count for each category among the top five highest-spending orders?

Input :

```
select m.category, count(*) as NumberOfItems
from orders o inner join menu m on o.item_id=m.menu_item_id
where order_id in (440,2075,1957,330,2675)
group by m.category
order by NumberOfItems desc;
```

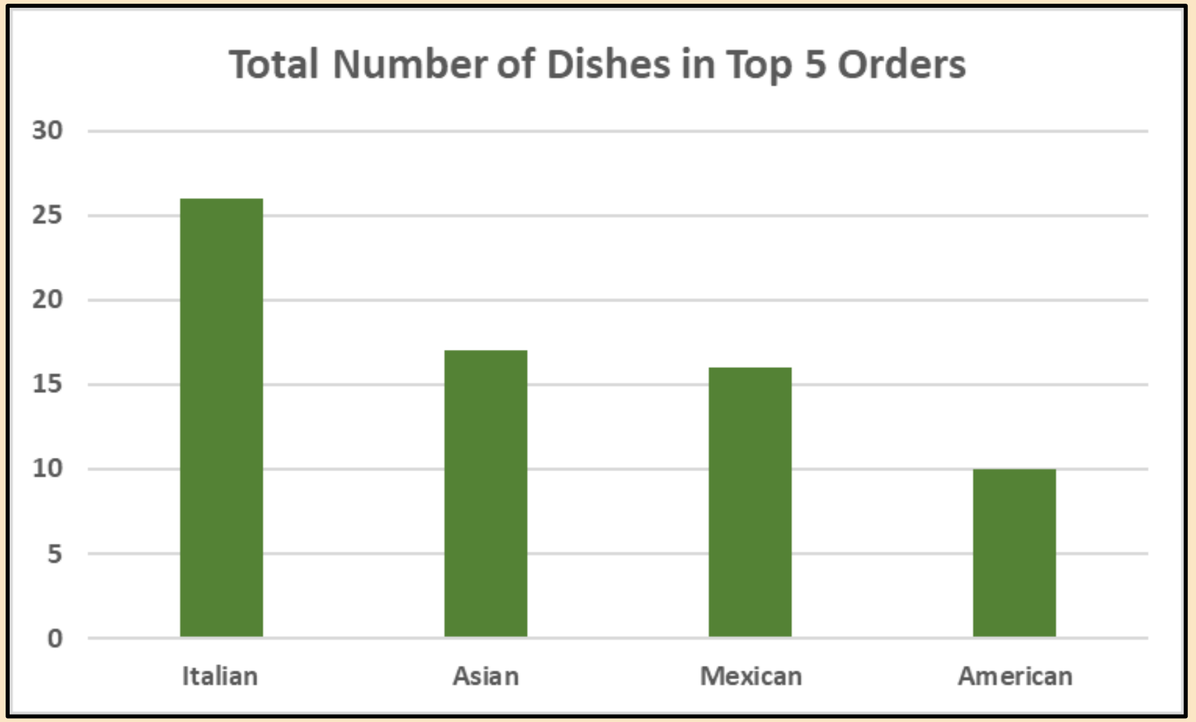
Output :

category	NumberOfItems
Italian	26
Asian	17
Mexican	16
American	10

DATA INSIGHTS & FINDINGS:

8. Top five highest-value orders were extracted for business insights.

- The top five highest-value orders indicate what premium customers prefer, guiding VIP offerings or exclusive deals.



List the items that are expensive but underperforming.

Input :

```sql
Select m.item_name, m.category, m.price, o.total_orders
from menu m inner join
    (select item_id, COUNT(*) as total_orders
    from orders
    group by item_id) o
    on m.menu_item_id = o.item_id
where o.total_orders < (
    select AVG(order_count)
    from (
        select COUNT(*) as order_count
        from orders
        group by item_id
    ) as sub
)
AND m.price > (
    select AVG(price) from menu
)
order by o.total_orders;
```



DATA INSIGHTS & FINDINGS:

9. The costly yet underperforming items have been identified.

- Run targeted promotions for these items (e.g., discounts or combo meals) to boost visibility and sales.
- Revise pricing or portion sizes to better align with customer expectations and perceived value.
- Collect customer feedback to understand issues; if improvements don't work, consider removing these items from the menu.

item_name	category	price	total_orders
Cheese Lasagna	Italian	15.5	207
Steak Tacos	Mexican	13.95	214
Shrimp Scampi	Italian	19.95	239
Fettuccine Alfredo	Italian	14.5	249
Meat Lasagna	Italian	17.95	273
Salmon Roll	Asian	14.95	324
Steak Burrito	Mexican	14.95	354
Mushroom Ravioli	Italian	15.5	359
Pork Ramen	Asian	17.95	360
Chicken Parmesan	Italian	17.95	364
Spaghetti	Italian	14.5	367

THANK YOU FOR YOUR ATTENTION