

• Return conversion rates from session to order by device type

```
*****  
SELECT DEVICE_TYPE  
, COUNT(DISTINCT WEBSITE_SESSIONS.WEBSITE_SESSION_ID)  
NUMBER_OF_WEBSITE_SESSIONS  
, COUNT(DISTINCT ORDER_ID) AS NUMBER_OF_ORDERS  
, COUNT(DISTINCT ORDER_ID) / COUNT(DISTINCT  
WEBSITE_SESSIONS.WEBSITE_SESSION_ID) AS CONVERSION_RATE  
FROM WEBSITE_SESSIONS  
LEFT JOIN ORDERS ON ORDERS.WEBSITE_SESSION_ID =  
WEBSITE_SESSIONS.WEBSITE_SESSION_ID  
WHERE website_sessions.CREATED_AT < '2012-05-11'  
AND UTM_SOURCE = 'gsearch'  
AND UTM_CAMPAIGN = 'nonbrand'  
GROUP BY 1  
*****
```

• Channel Portfolio Analysis : Identify traffic coming from multiple marketing channels, we will use utm parameters stored in our sessions table

```
*****  
SELECT CAST(MIN(CREATED_AT) AS DATE) AS WEEK_START_DATE -- SUNDAY OF EACH  
WEEK  
, COUNT(*) AS TOTAL_SESSIONS  
, COUNT(CASE WHEN UTM_SOURCE = 'gsearch' then 1 else null end)  
gsearch_session_count  
, COUNT(CASE WHEN UTM_SOURCE = 'bsearch' then 1 else null end)  
bsearch_session_count  
FROM WEBSITE_SESSIONS  
WHERE CREATED_AT BETWEEN '2012-08-22' AND '2012-11-29'  
AND UTM_CAMPAIGN = 'nonbrand'  
group by WEEK(CREATED_AT)  
*****
```

• Pull weekly sessions search and bsearch nonbrand sessions by device type from 4 Nov - 22 Dec

```
*****  
SELECT CAST(MIN(CREATED_AT) AS DATE) WEEK_START_DATE  
, COUNT(*) TOTAL_SESSIONS  
, COUNT(CASE WHEN UTM_SOURCE = 'gsearch' AND DEVICE_TYPE = 'desktop' then 1  
else null end) gsearch_Desktop_session_count  
, COUNT(CASE WHEN UTM_SOURCE = 'bsearch' AND DEVICE_TYPE = 'desktop' then 1  
else null end) bsearch_Desktop_session_count  
, COUNT(CASE WHEN UTM_SOURCE = 'bsearch' AND DEVICE_TYPE = 'desktop' then 1  
else null end) / COUNT(CASE WHEN UTM_SOURCE = 'gsearch' AND DEVICE_TYPE =  
'desktop' then 1 else null end) percentage_gm_bm  
FROM WEBSITE_SESSIONS  
WHERE UTM_CAMPAIGN = 'nonbrand'  
AND DEVICE_TYPE IN ('mobile', 'desktop')  
AND CREATED_AT BETWEEN '2012-11-04' AND '2012-12-22'  
GROUP BY WEEK(CREATED_AT)  
*****
```

⌚ Return number of pageviews for each URL

```
*****
SELECT PAGEVIEW_URL
, COUNT(DISTINCT WEBSITE_PAGEVIEW_ID) AS PAGEVIEWS
FROM WEBSITE_PAGEVIEWS
WHERE CREATED_AT < '2012-06-09'
GROUP BY 1
ORDER BY PAGEVISS DESC
*****
```

⌚ Return number of sessions who are landing on the home page

```
*****
CREATE TEMPORARY TABLE FIRST_PAGEVIEW
SELECT WEBSITE_SESSION_ID
, MIN(WEBSITE_PAGEVIEW_ID) AS MIN_PAGEVIEW_ID
FROM WEBSITE_PAGEVIEWS
WHERE WEBSITE_PAGEVIEW_ID < 1000
GROUP BY 1;

SELECT FIRST_PAGEVIEW.WEBSITE_SESSION_ID
, WEBSITE_PAGEVIEWS.PAGEVIEW_URL AS LANDING_PAGE
, COUNT(DISTINCT FIRST_PAGEVIEW.WEBSITE_SESSION_ID) AS SESSIONS_HITTING_THIS_LANDER
FROM FIRST_PAGEVIEW
LEFT JOIN WEBSITE_PAGEVIEWS ON FIRST_PAGEVIEW.MIN_PAGEVIEW_ID =
WEBSITE_PAGEVIEWS.WEBSITE_PAGEVIEW_ID
*****
```

⌚ Return weekly trends for both mobile and desktop to see the impact on volume of users.

```
*****
SELECT MIN(DATE(CREATED_AT)) AS WEEK_START_DATE
, COUNT(DISTINCT CASE WHEN DEVICE_TYPE = 'desktop' THEN WEBSITE_SESSION_ID ELSE
NULL END) AS DESKTOP_SESSIONS
, COUNT(DISTINCT CASE WHEN DEVICE_TYPE = 'mobile' THEN WEBSITE_SESSION_ID ELSE
NULL END) AS MOBILE_SESSIONS
FROM WEBSITE_SESSIONS
WHERE WEBSITE_SESSIONS.CREATED_AT < '2012-06-09'
AND WEBSITE_SESSIONS_CREATED_AT > '2012-04-15'
AND UTM_SOURCE = 'gsearch'
AND UTM_CAMPAIGN = 'nonbrand'
GROUP BY 1
*****
```

⌚ Determine the number of times a primary product was purchased alone versus with another item in customers cart.

```
*****
SELECT PRIMARY_PRODUCT_ID
, COUNT(DISTINCT CASE WHEN ITEMS_PURCHASED = 1
THEN ORDER_ID ELSE NULL END) AS SINGLE_ITEM_ORDERS
, COUNT(DISTINCT CASE WHEN ITEMS_PURCHASED = 2
THEN ORDER_ID ELSE NULL END) AS TWO_ITEM_ORDERS
FROM ORDERS
WHERE ORDER_ID BETWEEN 21000 AND 32000
GROUP BY 1
*****
```

• Return nonbranded trended session volume by week for the brand gsearch

```
*****  
SELECT MIN(CREATED_AT) WEEK_STARTED  
, COUNT(*) NUMBER_OF_SESSIONS  
FROM WEBSITE_SESSIONS  
WHERE CREATED_AT < '2025-05-01'  
AND UTM_SOURCE = 'gsearch'  
AND UTM_CAMPAIGN 'nonbrand'  
GROUP BY YEAR(CREATED_AT), WEEK(CREATED_AT)  
*****
```

• Return conversion rates from sessions to order by device type

```
*****  
SELECT DEVICE_TYPE  
, COUNT(DISTINCT WEBSITE_SESSIONS.WEBSITE_SESSION_ID)  
NUMBER_OF_WEBSITE_SESSIONS  
, COUNT(DISTINCT ORDER_ID) AS NUMBER_OF_ORDERS  
, COUNT(DISTINCT ORDER_ID) /  
    COUNT(DISTINCT WEBSITE_SESSIONS.WEBSITE_SESSION_ID) AS CONVERSION_RATE  
FROM WEBSITE_SESSIONS  
LET JOIN ORDERS ON ORDERS.WEBSITE_SESSION_ID =  
WEBSITE_SESSIONS.WEBSITE_SESSION_ID  
WHERE WEBSITE_SESSIONS.CREATED_AT < '2012-05-11'  
AND UTM_SOURCE = 'gsearch'  
AND UTM_CAMPAIGN = 'nonbrand'  
GROUP BY 1  
*****
```

• Determine the company's growth volume by the Overall Session and Order Volume; trended in Quarterly review.

```
*****  
SELECT YEAR(website_sessions.created_at) AS Year  
, QUARTER(website_sessions.created_at) AS Quarter,  
, COUNT(DISTINCT website_sessions.website_session_id) AS Sessions,  
, COUNT(DISTINCT orders.order_id) AS Orders  
FROM website_sessions  
LEFT JOIN orders ON website_sessions.website_session_id =  
orders.website_session_id  
WHERE website_sessions.created_at < '2015-01-01'  
GROUP BY YEAR(website_sessions.created_at),  
QUARTER(website_sessions.created_at)  
*****
```

• Demonstrate all the efficiency improvements since the website launch period by Showcasing the: Session to Order Conversion Rate | Revenue per Order | Revenue per Session; in Quarterly review

```
*****
SELECT YEAR(website_sessions.created_at) AS year
    , QUARTER(website_sessions.created_at) AS Quarter
    , COUNT(DISTINCT orders.order_id)/COUNT(DISTINCT
website_sessions.website_session_id) AS Sess_to_Order_Convr_rate
    , SUM(orders.price_usd)/COUNT(DISTINCT orders.order_id) AS
Revenue_per_Order
    , SUM(orders.price_usd)/COUNT(DISTINCT
website_sessions.website_session_id) AS Revenue_per_Session
FROM website_sessions
LEFT JOIN orders ON website_sessions.website_session_id =
orders.website_session_id
WHERE website_sessions.created_at < '2015-01-01'
GROUP BY YEAR(website_sessions.created_at),
        QUARTER(website_sessions.created_at)
*****
```

• Showcase the Paid Channels' Traffic Efficiency to Order by Pulling the Quarterly trend for: i. Gsearch nonbrand ii. Bsearch nonbrand iii. G/Bsearch brand iv. Organic search v. Direct-type-in

```
*****
SELECT MIN(DATE(website_sessions.created_at)) Date_in_quarters
, COUNT(DISTINCT CASE WHEN utm_source = 'gsearch' AND utm_campaign =
'nonbrand' THEN order_id END) AS Gsearch_nonbrand
, COUNT(DISTINCT CASE WHEN utm_source = 'bsearch' AND utm_campaign =
'nonbrand' THEN order_id END) AS Bsearch_nonbrand
, COUNT(DISTINCT CASE WHEN utm_source IN ('gsearch', 'bsearch') AND
utm_campaign = 'brand' THEN order_id END) AS Brand_search
, COUNT(DISTINCT CASE WHEN utm_source IS NULL AND http_referer IN
('https://www.gsearch.com', 'https://www.bsearch.com') THEN order_id END) AS
Organic_search
, COUNT(DISTINCT CASE WHEN utm_source IS NULL AND http_referer IS NULL THEN
order_id END) AS Direct_type_in
FROM website_sessions
LEFT JOIN orders ON website_sessions.website_session_id =
orders.website_session_id
WHERE website_sessions.created_at < '2015-01-01'
GROUP BY YEAR(website_sessions.created_at),
        QUARTER(website_sessions.created_at)
*****
```

• Return the overall session to Order Conversion Rate trend for the same Channels above

```
*****
SELECT YEAR(website_sessions.created_at) AS Year
, QUARTER(website_sessions.created_at) AS Quarter
, COUNT(DISTINCT CASE WHEN utm_source = 'gsearch' AND utm_campaign =
'nonbrand' THEN order_id ELSE NULL END)
/COUNT(DISTINCT CASE WHEN utm_source = 'gsearch' AND utm_campaign =
'nonbrand' THEN website_sessions.website_session_id ELSE NULL END) AS
Gsearch_nonbrand_Convr_rate
, COUNT(DISTINCT CASE WHEN utm_source = 'bsearch' AND utm_campaign =
'nonbrand' THEN order_id END) /COUNT(DISTINCT CASE WHEN utm_source =
'bsearch' AND utm_campaign = 'nonbrand' THEN
website_sessions.website_session_id END) AS Bsearch_nonbrand_Convr_rate
, COUNT(DISTINCT CASE WHEN utm_source IN ('gsearch', 'bsearch') AND
utm_campaign = 'brand' THEN order_id END)/COUNT(DISTINCT CASE WHEN utm_source
IN ('gsearch', 'bsearch') AND utm_campaign = 'brand' THEN
website_sessions.website_session_id END) AS Brand_search_Convr_rate
, COUNT(DISTINCT CASE WHEN utm_source IS NULL AND http_referer IN
('https://www.gsearch.com', 'https://www.bsearch.com') THEN order_id END)
/COUNT(DISTINCT CASE WHEN utm_source IS NULL AND http_referer IN
('https://www.gsearch.com', 'https://www.bsearch.com') THEN
website_sessions.website_session_id END) AS Organic_search_Convr_rate
, COUNT(DISTINCT CASE WHEN utm_source IS NULL AND http_referer IS NULL THEN
order_id END /COUNT(DISTINCT CASE WHEN utm_source IS NULL AND http_referer IS
NULL THEN website_sessions.website_session_id END) AS
Direct_type_in_Convr_rate
FROM website_sessions
LEFT JOIN orders
    ON website_sessions.website_session_id = orders.website_session_id
WHERE website_sessions.created_at < '2015-01-01'
GROUP BY YEAR(website_sessions.created_at),
        QUARTER(website_sessions.created_at)
*****
```

• Compare the impact of introducing A Product every year on the Sales and Revenue, alongside the Margin; trending by Year.

```
*****
SELECT
    YEAR(created_at) AS Year,
    COUNT(DISTINCT order_id) AS Total_sales,
    SUM(price_usd) AS Total_revenue,
    SUM(price_usd - cogs_usd) AS Margin
FROM orders
WHERE primary_product_id = 1
    AND created_at < '2015-01-01'
GROUP BY 1;
*****
```

• Return Overall Products sessions

```
*****
SELECT YEAR(created_at) AS Year
, COUNT(DISTINCT order_id) AS Total_sales
, SUM(price_usd) AS Total_revenue
, SUM(price_usd - cogs_usd) AS Margin
FROM orders
WHERE created_at < '2015-01-01'
GROUP BY 1;
*****
```

• Find all customers who placed at least 1 order in 2017 but did not place any orders in 2018.

```
*****  
SELECT CONTACT_NAME  
, COUNT(*) NUMBER_OF_ORDERS  
, COUNT(CASE WHEN STRFTIME('%Y', ORDER_DATE) = '2017' THEN 1 END) CUST_2017  
, COUNT(CASE WHEN STRFTIME('%Y', ORDER_DATE) = '2018' THEN 1 END) CUST_2018  
FROM CUSTOMERS  
JOIN ORDERS ON ORDERS.CUSTOMER_ID = CUSTOMERS.CUSTOMER_ID  
GROUP BY 1  
HAVING COUNT(CASE WHEN STRFTIME('%Y', ORDER_DATE) = '2017' THEN 1 END) >= 1  
AND COUNT(CASE WHEN STRFTIME('%Y', ORDER_DATE) = '2018' THEN 1 END) = 0  
*****
```

• For each customer label as loyal or not loyal: Loyal = more than 10 orders.

```
*****  
SELECT CONTACT_NAME  
, COUNT(*) AS NUMBER_OF_ORDERS  
, CASE WHEN COUNT(*) > 10 THEN 'LOYAL' ELSE 'N/A' END AS  
LABEL_LOYAL_CUSTOMERS  
FROM CUSTOMERS  
JOIN ORDERS ON ORDERS.CUSTOMER_ID = CUSTOMERS.CUSTOMER_ID  
GROUP BY 1  
*****
```

• Find percent total for each Category

```
*****  
SELECT CATEGORY_NAME  
, AVG(UNIT_PRICE) AS AVG_UNIT_PRICE_FOR_CATEGORY  
, SUM(UNIT_PRICE * QUANTITY) TOTAL_PRICE_PER_CATEGORY  
, SUM(SUM(UNIT_PRICE * QUANTITY)) OVER()  
, SUM(UNIT_PRICE * QUANTITY) / SUM(SUM(UNIT_PRICE * QUANTITY)) OVER()  
FROM CATEGORIES  
JOIN PRODUCTS ON PRODUCTS.CATEGORY_ID = CATEGORIES.CATEGORY_ID  
JOIN ORDER_DETAILS ON ORDER_DETAILS.PRODUCT_ID = PRODUCTS.PRODUCT_ID  
GROUP BY 1  
*****
```

• Calculate the average number of products per product category.

```
*****  
SELECT ROUND(AVG(NUMBER_OF_PRODUCTS), 2) AVG_NUMBER_OF_PRODUCTS_PER_CATEGORY  
FROM  
(SELECT COUNT(PRODUCT_NAME) NUMBER_OF_PRODUCTS  
, CATEGORY_NAME  
FROM PRODUCTS  
JOIN CATEGORIES ON CATEGORIES.CATEGORY_ID = PRODUCTS.CATEGORY_ID  
GROUP BY CATEGORY_NAME) TEMP1  
*****
```

• Calculate average number of employees per manager.

```
*****  
SELECT AVG(NUMBER_EMPLOYEES) AS AVG_NUMBER_OF_EMPLOYEES  
FROM  
(SELECT COUNT(*) NUMBER_EMPLOYEES  
,REPORTS_TO  
FROM EMPLOYEES  
WHERE REPORTS_TO IN (2,5)  
GROUP BY 2) TEMP1  
*****
```

• Calculate the average number of products per product category.

```
*****  
SELECT ROUND(AVG(NUMBER_OF_PRODUCTS),2) AVG_NUMBER_OF_PRODUCTS_PER_CATEGORY  
FROM  
(SELECT COUNT(PRODUCT_NAME) NUMBER_OF_PRODUCTS  
, CATEGORY_NAME  
FROM PRODUCTS  
JOIN CATEGORIES ON CATEGORIES.CATEGORY_ID = PRODUCTS.CATEGORY_ID  
GROUP BY CATEGORY_NAME) TEMP1  
*****
```

• For each product category, show total revenue and average unit price. Flag categories with average price below a threshold, like \$10.

```
*****  
SELECT CATEGORY_NAME  
, AVG(UNIT_PRICE) AS AVG_UNIT_PRICE_FOR_CATEGORY  
, SUM(UNIT_PRICE * QUANTITY) AS TOTAL_REVENUE  
, CASE WHEN AVG(UNIT_PRICE) < 25  
        THEN 'LESS THAN 25' ELSE 'ABOVE 25'  
        END AS MORE_OR_LESS_THAN_TWENTY_FIVE  
FROM CATEGORIES  
JOIN PRODUCTS ON PRODUCTS.CATEGORY_ID = CATEGORIES.CATEGORY_ID  
JOIN ORDER_DETAILS ON ORDER_DETAILS.PRODUCT_ID = PRODUCTS.PRODUCT_ID  
GROUP BY 1  
*****
```

• Find all orders that are above average order value and label them as either above or below.

```
*****  
SELECT ORDER_ID  
, SUM(QUANTITY * UNIT_PRICE) TOTAL_PRICE_PER_ORDER  
, AVG(SUM(QUANTITY * UNIT_PRICE)) OVER() AOV  
, CASE WHEN  
        SUM(QUANTITY * UNIT_PRICE) > AVG(SUM(QUANTITY * UNIT_PRICE))  
        OVER()  
        THEN 'ABOVE AVG ORDER PRICE'  
        ELSE 'BELOW AVG ORDER PRICE'  
        END AS BELOW_OR_ABOVE  
FROM ORDER_DETAILS  
JOIN PRODUCTS ON PRODUCTS.PRODUCT_ID = ORDER_DETAILS.PRODUCT_ID  
GROUP BY 1  
*****
```

• Identify the customers whose revenue falls below the 10th percentile.

```
*****  
WITH CTE1 AS (SELECT CUSTOMERS.CONTACT_NAME  
, SUM(QUANTITY * UNIT_PRICE) TOTAL_REVENUE  
, SUM(SUM(QUANTITY * UNIT_PRICE)) OVER(ORDER BY SUM(QUANTITY * UNIT_PRICE))  
RUNNING_TOTAL  
, SUM(SUM(QUANTITY * UNIT_PRICE)) OVER() TOTAL_REV  
, SUM(SUM(QUANTITY * UNIT_PRICE)) OVER(ORDER BY SUM(QUANTITY * UNIT_PRICE))  
/ SUM(SUM(QUANTITY * UNIT_PRICE)) OVER() * 100 PERCENTAGE  
FROM CUSTOMERS  
JOIN ORDERS ON ORDERS.CUSTOMER_ID = CUSTOMERS.CUSTOMER_ID  
JOIN ORDER_DETAILS ON ORDER_DETAILS.ORDER_ID = ORDERS.ORDER_ID  
JOIN PRODUCTS ON PRODUCTS.PRODUCT_ID = ORDER_DETAILS.PRODUCT_ID  
GROUP BY 1)  
SELECT CONTACT_NAME  
, RUNNING_TOTAL  
, TOTAL_REV  
, PERCENTAGE  
FROM CTE1  
WHERE PERCENTAGE < 10  
*****
```

• Find customers who have ordered at least one product from every category.

```
*****  
SELECT CUSTOMERS.CUSTOMER_ID  
, COUNT(DISTINCT CATEGORY_ID)  
FROM CUSTOMERS  
JOIN ORDERS ON ORDERS.CUSTOMER_ID = CUSTOMERS.CUSTOMER_ID  
JOIN ORDER_DETAILS ON ORDER_DETAILS.ORDER_ID = ORDERS.ORDER_ID  
JOIN PRODUCTS ON PRODUCTS.PRODUCT_ID = ORDER_DETAILS.PRODUCT_ID  
GROUP BY 1  
HAVING COUNT(DISTINCT CATEGORY_ID) >1  
ORDER BY COUNT(DISTINCT CATEGORY_ID) DESC  
*****
```

• For the customers countries that start with letter "S" find the average number of orders per customer for each country.

```
*****  
SELECT COUNTRY  
, AVG(NUMBER_OF_ORDERS) AVG_NUM_ORDERS_PER_CUST  
FROM  
(SELECT CUSTOMERS.CUSTOMER_ID  
, COUNT(*) NUMBER_OF_ORDERS  
, COUNTRY  
FROM CUSTOMERS  
JOIN ORDERS ON ORDERS.CUSTOMER_ID = CUSTOMERS.CUSTOMER_ID  
WHERE COUNTRY LIKE 'S%'  
GROUP BY 1,3) TEMP  
GROUP BY 1  
*****
```

• Return products that contribute to 80% of the overall Revenue.

```
*****  
WITH CTE1 AS (select PRODUCT_NAME  
,SUM(QUANTITY * UNIT_PRICE) revenue_per_product  
,SUM(sum(quantity * unit_price)) over()  
, SUM(QUANTITY * UNIT_PRICE) / SUM(sum(quantity * unit_price)) over() * 100  
PERCENT_OF_TOTAL  
from products  
join order_details on products.product_id = order_details.product_id  
JOIN ORDERS ON ORDERS.ORDER_ID = ORDER_DETAILS.ORDER_ID  
WHERE ORDER_DATE >= JULIANDAY('2017-01-21')  
GROUP BY 1  
ORDER BY revenue_per_product DESC)  
  
, CTE2 AS (SELECT PRODUCT_NAME  
, REVENUE_PER_PRODUCT  
, PERCENT_OF_TOTAL  
,SUM(PERCENT_OF_TOTAL) OVER(ORDER BY PERCENT_OF_TOTAL DESC) RUNNING_TOTAL  
FROM CTE1)  
  
SELECT *  
FROM CTE2  
WHERE RUNNING_TOTAL <=81
```

• Find users who were active for 4 consecutive days.

```
*****  
WITH customer_orders AS (  
    SELECT  
        customerid,  
        CAST(orderdate AS date) AS order_date  
    FROM orders  
    GROUP BY customerid, CAST(orderdate AS date)  
)  
, ordered_dates AS (  
    SELECT  
        customerid,  
        order_date,  
        ROW_NUMBER() OVER (PARTITION BY customerid ORDER BY order_date) AS rn  
    FROM customer_orders  
)  
, grouped_dates AS (  
    SELECT  
        customerid,  
        order_date,  
        order_date - (rn * INTERVAL '1 day') AS grp_key  
    FROM ordered_dates  
)  
SELECT  
    customerid,  
    MIN(order_date) AS start_date,  
    MAX(order_date) AS end_date,  
    COUNT(*) AS consecutive_days  
FROM grouped_dates  
GROUP BY customerid, grp_key  
HAVING COUNT(*) >= 4  
ORDER BY customerid, start_date;
```

• Find Number of orders related to the Beverages category for each customer

```
*****  
SELECT FIRST_NAME ||' '|LAST_NAME  
, count(DISTINCT O.ORDER_ID)  
FROM EMPLOYEES E  
JOIN ORDERS O ON O.EMPLOYEE_ID = E.EMPLOYEE_ID  
JOIN ORDER_DETAILS OD ON OD.ORDER_ID = O.ORDER_ID  
JOIN PRODUCTS P ON P.PRODUCT_ID = OD.PRODUCT_ID  
JOIN CATEGORIES C ON C.CATEGORY_ID = P.CATEGORY_ID  
WHERE CATEGORY_NAME = 'Beverages'  
GROUP BY 1  
*****
```

• Add Columns that show Product Name and Revenue for worst selling Product

```
*****  
WITH top_income AS (  
    SELECT CATEGORY_NAME  
, PRODUCT_NAME  
, SUM(UNIT_PRICE * QUANTITY) AS REVENUE  
, RANK() OVER (PARTITION BY CATEGORY_NAME ORDER BY SUM(UNIT_PRICE * QUANTITY)  
DESC) RK  
FROM CATEGORIES  
JOIN PRODUCTS ON PRODUCTS.CATEGORY_ID = CATEGORIES.CATEGORY_ID  
JOIN ORDER_DETAILS ON ORDER_DETAILS.PRODUCT_ID = PRODUCTS.PRODUCT_ID  
GROUP BY 1,2      )  
  
,lowest_income AS (  
    SELECT CATEGORY_NAME  
, PRODUCT_NAME  
, SUM(UNIT_PRICE * QUANTITY) AS REVENUE  
, RANK() OVER (PARTITION BY CATEGORY_NAME ORDER BY SUM(UNIT_PRICE * QUANTITY)  
ASC) RK2  
FROM CATEGORIES  
JOIN PRODUCTS ON PRODUCTS.CATEGORY_ID = CATEGORIES.CATEGORY_ID  
JOIN ORDER_DETAILS ON ORDER_DETAILS.PRODUCT_ID = PRODUCTS.PRODUCT_ID  
GROUP BY 1,2)  
  
SELECT top_income.CATEGORY_NAME  
, top_income.PRODUCT_NAME as highest_selling_product  
, top_income.REVENUE as highest_selling_product_price  
, lowest_income.product_name as lowest_selling_product  
, lowest_income.revenue as lowest_selling_product_price  
FROM top_income  
JOIN lowest_income ON lowest_income.CATEGORY_NAME = top_income.CATEGORY_NAME  
WHERE RK = 1  
AND RK2 = 1  
*****
```

• For each employee, calculate their total sales revenue for each quarter of the year 2016. The output should include the employee's name and four separate columns for the total sales in Quarter 1, Quarter 2, Quarter 3, and Quarter 4. If an employee had no sales in a particular quarter, the value should be

```
*****
```

```
SELECT FIRST_NAME || ' ' || LAST_NAME
, SUM(QUANTITY * UNIT_PRICE) TOTAL_REVENUE
, SUM(CASE WHEN
        STRFTIME('%m', ORDER_DATE) IN ('01', '02', '03') THEN QUANTITY * UNIT_PRICE END)
AS Q1
, SUM(CASE WHEN
        STRFTIME('%m', ORDER_DATE) IN ('04', '05', '06') THEN QUANTITY * UNIT_PRICE END)
AS Q2
, SUM(CASE WHEN
        STRFTIME('%m', ORDER_DATE) IN ('07', '08', '09') THEN QUANTITY * UNIT_PRICE END)
AS Q3
, SUM(CASE WHEN
        STRFTIME('%m', ORDER_DATE) IN ('10', '11', '12') THEN QUANTITY * UNIT_PRICE END)
AS Q4
FROM EMPLOYEES
JOIN ORDERS ON ORDERS.EMPLOYEE_ID = EMPLOYEES.EMPLOYEE_ID
JOIN ORDER_DETAILS ON ORDER_DETAILS.ORDER_ID = ORDERS.ORDER_ID
JOIN PRODUCTS ON PRODUCTS.PRODUCT_ID = ORDER_DETAILS.PRODUCT_ID
GROUP BY 1
*****
```

• For each employee, calculate their total sales revenue in 2016 and 2017, and compute the percentage growth.

```
*****
```

```
WITH CTE1 AS (SELECT FIRST_NAME
, LAST_NAME
, SUM(CASE WHEN STRFTIME('%Y', ORDER_DATE) = '2016'
        THEN QUANTITY * UNIT_PRICE END) AS REVENUE_2016
, SUM(CASE WHEN STRFTIME('%Y', ORDER_DATE) = '2017'
        THEN QUANTITY * UNIT_PRICE END) AS REVENUE_2017
FROM EMPLOYEES
JOIN ORDERS ON ORDERS.EMPLOYEE_ID = EMPLOYEES.EMPLOYEE_ID
JOIN ORDER_DETAILS ON ORDER_DETAILS.ORDER_ID = ORDERS.ORDER_ID
JOIN PRODUCTS ON PRODUCTS.PRODUCT_ID = ORDER_DETAILS.PRODUCT_ID
GROUP BY 1,2)
SELECT FIRST_NAME
, LAST_NAME
, REVENUE_2016
, REVENUE_2017
, ((REVENUE_2017 - REVENUE_2016) / REVENUE_2016) * 100 AS PCT_CHANGE
FROM CTE1
*****
```

• Calculate month over month increase or decrease

```
*****
```

```
SELECT COUNT(*) NUMBER_OF_ORDERS
, STRFTIME('%m', order_date) as mnth
, LAG(COUNT(*)) OVER(ORDER BY STRFTIME('%m', order_date)ASC)
, (COUNT(*) / (LAG(COUNT(*)) OVER(ORDER BY STRFTIME('%m', order_date)ASC) * 1.0) -
1)* 100 AS MoM_change
FROM ORDERS
group by 2
*****
```

• For each order number return order value, freight charge, freight charge + order value:

```
*****  
SELECT ORDERS.ORDER_ID  
, SUM(QUANTITY * UNIT_PRICE) AS ORDER_VALUE  
, FREIGHT  
, SUM(QUANTITY * UNIT_PRICE) + FREIGHT AS FREIGHT_PLUS_ORDER_VALUE  
, (SUM(QUANTITY * UNIT_PRICE) - (SUM(QUANTITY * UNIT_PRICE) * DISCOUNT)) + FREIGHT  
AS DISCOUNTED_PRICE  
FROM ORDERS  
JOIN ORDER_DETAILS ON ORDER_DETAILS.ORDER_ID = ORDERS.ORDER_ID  
JOIN PRODUCTS ON PRODUCTS.PRODUCT_ID = ORDER_DETAILS.PRODUCT_ID  
GROUP BY 1,3  
*****
```

• Find all orders that have above average order value and label them as above or below average:

```
*****  
WITH CTE1 AS (  
    SELECT ORDER_ID  
, SUM(QUANTITY * UNIT_PRICE) TOTAL_PRICE_PER_ORDER  
    FROM ORDER_DETAILS  
    JOIN PRODUCTS ON PRODUCTS.PRODUCT_ID = ORDER_DETAILS.PRODUCT_ID  
    GROUP BY 1  
)  
  
, CTE2 AS (  
    SELECT AVG(TOTAL_PRICE_PER_ORDER) AVG_ORDER_VALUE  
    FROM CTE1  
  
)  
SELECT CTE1.ORDER_ID  
, CTE1.TOTAL_PRICE_PER_ORDER  
, AVG_ORDER_VALUE  
, CASE  
    WHEN CTE1.TOTAL_PRICE_PER_ORDER > AVG_ORDER_VALUE  
    THEN 'ABOVE AVG ORDER VALUE'  
    ELSE 'BELOW AVG ORDER VALUE'  
    END AS ABOVE_OR_BELOW  
FROM CTE1, CTE2  
*****
```

• Find the customer who placed orders over the longest span of time (from first order to most recent)

```
*****  
SELECT CONTACT_NAME  
, MIN(ORDER_DATE) FIRST_ORDER_DATE  
, MAX(ORDER_DATE) MOST_RECENT_ORDER_DATE  
, JULIANDAY(MAX(ORDER_DATE)) - JULIANDAY(MIN(ORDER_DATE)) CUSTOMER_DURATION  
FROM CUSTOMERS  
JOIN ORDERS ON ORDERS.CUSTOMER_ID = CUSTOMERS.CUSTOMER_ID  
GROUP BY 1  
ORDER BY CUSTOMER_DURATION DESC  
LIMIT 1  
*****
```