

CASE STUDY

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1 Câu hỏi 1

Tỷ lệ phần trăm lượt truy cập có sự kiện mua hàng là bao nhiêu?

```
SELECT ROUND(  
    SUM(CASE  
        WHEN ei.event_name = 'Purchase' THEN 1  
        ELSE 0  
    END)::numeric  
    /  
    (COUNT(DISTINCT(e.visit_id)))::numeric,  
    3  
)  
FROM events e  
JOIN event_identifier ei  
    ON e.event_type = ei.event_type;
```

Output

	round numeric 
1	0.499

2 Câu hỏi 2

Tỷ lệ phần trăm lượt truy cập xem trang thanh toán nhưng không có sự kiện mua hàng là bao nhiêu?

```
WITH checkout_visit AS (  
    SELECT DISTINCT visit_id  
    FROM events e  
    NATURAL JOIN page_hierarchy ph  
    WHERE ph.page_name = 'Checkout'  
),  
purchase AS (  
    SELECT DISTINCT visit_id  
    FROM events e  
    NATURAL JOIN event_identifier ei  
    WHERE ei.event_name = 'Purchase'  
)  
SELECT ROUND(  
    (  
        SELECT COUNT(*)  
        FROM checkout_visit  
        WHERE visit_id NOT IN (  
            SELECT visit_id  
            FROM purchase  
        )  
    )::numeric / (  
        SELECT COUNT(DISTINCT visit_id)  
        FROM events  
    )::numeric,  
    3  
) AS view_checkout_no_purchase;
```

Output

	view_checkout_no_purchase numeric
1	0.091

3 Câu hỏi 3

3 trang có số lượt xem nhiều nhất là những trang nào?

```
SELECT ph.page_name, COUNT(DISTINCT(e.visit_id)) AS view_count
FROM events e JOIN page_hierarchy ph ON e.page_id = ph.page_id
JOIN event_identifier ei ON e.event_type = ei.event_type
WHERE ei.event_name = 'Page View'
GROUP BY ph.page_name
ORDER BY COUNT(DISTINCT(e.visit_id)) DESC
LIMIT 3
```

Output

	page_name character varying (14) 🔒	view_count bigint 🔒
1	All Products	3174
2	Checkout	2103
3	Home Page	1782

4 Câu hỏi 4

Số lượt xem và số lần thêm vào giỏ hàng cho từng danh mục sản phẩm là bao nhiêu?

```
SELECT
    ph.product_category,
    SUM(CASE
        WHEN ei.event_name = 'Page View' THEN 1
        ELSE 0
    END) AS page_view_count,
    SUM(CASE
        WHEN ei.event_name = 'Add to Cart' THEN 1
        ELSE 0
    END) AS add_to_cart_count
FROM events e
NATURAL JOIN page_hierarchy ph
NATURAL JOIN event_identifier ei
WHERE product_category IS NOT NULL
GROUP BY ph.product_category;
```

Output

	product_category character varying (9) 🔒	page_view_count bigint 🔒	add_to_cart_count bigint 🔒
1	Luxury	3032	1870
2	Shellfish	6204	3792
3	Fish	4633	2789

5 Câu hỏi 5

3 sản phẩm có số lượt mua nhiều nhất là gì?

```
WITH check_purchase AS (  
    SELECT DISTINCT(e.visit_id)  
    FROM events e  
    JOIN event_identifier ei  
        ON e.event_type = ei.event_type  
    WHERE ei.event_name = 'Purchase'  
),  
add_to_cart AS (  
    SELECT e.visit_id, ph.product_id, ph.page_name  
    FROM events e  
    JOIN page_hierarchy ph  
        ON e.page_id = ph.page_id  
    JOIN event_identifier ei  
        ON e.event_type = ei.event_type  
    WHERE ei.event_name = 'Add to Cart'  
        AND e.visit_id IN (SELECT visit_id FROM check_purchase)  
)  
SELECT product_id,  
       COUNT(*) AS purchase_count  
FROM add_to_cart  
GROUP BY product_id  
ORDER BY COUNT(*) DESC  
LIMIT 3;
```

Output

	product_id integer	purchase_count bigint
1	7	754
2	9	726
3	8	719

6 Câu hỏi 6

Sử dụng một truy vấn SQL duy nhất - tạo một bảng đầu ra mới có các chi tiết sau:

```
CREATE TEMP TABLE product_analysis AS (  
  -- Moi san pham duoc xem bao nhieu lan  
  WITH prod_page_view AS (  
    SELECT DISTINCT(ph.product_id),  
           COUNT(*) AS product_view  
    FROM events e  
    NATURAL JOIN page_hierarchy ph  
    NATURAL JOIN event_identifier ei  
    WHERE ei.event_name = 'Page View'  
    AND ph.product_id IS NOT NULL  
    GROUP BY ph.product_id  
  ),  
  
  -- Moi san pham duoc them vao gio hang bao nhieu lan  
  prod_add_to_cart AS (  
    SELECT DISTINCT(ph.product_id),  
           COUNT(*) AS product_to_cart  
    FROM events e  
    NATURAL JOIN page_hierarchy ph  
    NATURAL JOIN event_identifier ei  
    WHERE ei.event_name = 'Add to Cart'  
    AND ph.product_id IS NOT NULL  
    GROUP BY ph.product_id  
  ),  
  
  -- Moi san pham duoc them vao gio nhung khong duoc mua  
  check_purchase AS (  
    SELECT DISTINCT(e.visit_id)  
    FROM events e  
    JOIN event_identifier ei  
    ON e.event_type = ei.event_type  
    WHERE ei.event_name = 'Purchase'  
  ),  
);
```

```

add_to_cart_not_buy AS (
    SELECT ph.product_id,
           COUNT(*) AS product_not_buy
    FROM events e
    JOIN page_hierarchy ph
      ON e.page_id = ph.page_id
    JOIN event_identifier ei
      ON e.event_type = ei.event_type
    WHERE ei.event_name = 'Add to Cart'
           AND e.visit_id NOT IN (
               SELECT visit_id FROM check_purchase
           )
    GROUP BY ph.product_id
),

-- Moi san pham duoc mua bao nhieu lan
add_to_cart_buy AS (
    SELECT ph.product_id,
           COUNT(*) AS product_buy
    FROM events e
    JOIN page_hierarchy ph
      ON e.page_id = ph.page_id
    JOIN event_identifier ei
      ON e.event_type = ei.event_type
    WHERE ei.event_name = 'Add to Cart'
           AND e.visit_id IN (
               SELECT visit_id FROM check_purchase
           )
    GROUP BY ph.product_id
)

SELECT
    ppv.product_id,
    ppv.product_view,
    patc.product_to_cart,
    anb.product_not_buy,
    acb.product_buy
FROM prod_page_view ppv
JOIN prod_add_to_cart patc
  ON ppv.product_id = patc.product_id

```

```

JOIN add_to_cart_not_buy anb
  ON ppv.product_id = anb.product_id
JOIN add_to_cart_buy acb
  ON ppv.product_id = acb.product_id
ORDER BY ppv.product_id
);
SELECT * FROM product_analysis

```

Output

	product_id integer 🔒	product_view bigint 🔒	product_to_cart bigint 🔒	product_not_buy bigint 🔒	product_buy bigint 🔒
1	1	1559	938	227	711
2	2	1559	920	213	707
3	3	1515	931	234	697
4	4	1563	946	249	697
5	5	1469	924	217	707
6	6	1525	932	233	699
7	7	1547	968	214	754
8	8	1564	949	230	719
9	9	1568	943	217	726

7 Câu hỏi 7

Hãy tạo một bảng khác để tổng hợp thêm dữ liệu tương tự như câu 6 nhưng lần này là cho từng danh mục sản phẩm thay vì từng sản phẩm riêng lẻ.

```
CREATE TEMP TABLE category_analysis AS (  
  -- Moi danh muc duoc xem bao nhieu lan  
  WITH cat_page_view AS (  
    SELECT DISTINCT(ph.product_category),  
           COUNT(*) AS category_view  
    FROM events e  
    NATURAL JOIN page_hierarchy ph  
    NATURAL JOIN event_identifier ei  
    WHERE ei.event_name = 'Page View'  
          AND ph.product_category IS NOT NULL  
    GROUP BY ph.product_category  
  ),  
  
  -- Moi danh muc duoc them vao gio hang bao nhieu lan  
  cat_add_to_cart AS (  
    SELECT DISTINCT(ph.product_category),  
           COUNT(*) AS category_to_cart  
    FROM events e  
    NATURAL JOIN page_hierarchy ph  
    NATURAL JOIN event_identifier ei  
    WHERE ei.event_name = 'Add to Cart'  
          AND ph.product_category IS NOT NULL  
    GROUP BY ph.product_category  
  ),  
  
  -- Moi danh muc bi bo roi (them gio nhung khong mua)  
  check_purchase AS (  
    SELECT DISTINCT(e.visit_id)  
    FROM events e  
    JOIN event_identifier ei  
      ON e.event_type = ei.event_type  
    WHERE ei.event_name = 'Purchase'  
  ),  
  
  add_to_cart_not_buy AS (  
    SELECT DISTINCT(ph.product_category),  
           COUNT(*) AS category_not_buy  
    FROM events e  
    NATURAL JOIN page_hierarchy ph  
    NATURAL JOIN event_identifier ei  
    WHERE ei.event_name = 'Add to Cart'  
          AND ph.product_category IS NOT NULL  
          AND ei.visit_id NOT IN (SELECT visit_id FROM check_purchase)  
    GROUP BY ph.product_category  
  )  
);
```

```

SELECT ph.product_category,
       COUNT(*) AS category_not_buy
FROM events e
JOIN page_hierarchy ph
  ON e.page_id = ph.page_id
JOIN event_identifier ei
  ON e.event_type = ei.event_type
WHERE ei.event_name = 'Add to Cart'
  AND e.visit_id NOT IN (
    SELECT visit_id FROM check_purchase
  )
GROUP BY ph.product_category
),

-- Moi danh muc duoc mua bao nhieu lan
add_to_cart_buy AS (
  SELECT ph.product_category,
         COUNT(*) AS category_buy
  FROM events e
  JOIN page_hierarchy ph
    ON e.page_id = ph.page_id
  JOIN event_identifier ei
    ON e.event_type = ei.event_type
  WHERE ei.event_name = 'Add to Cart'
    AND e.visit_id IN (
      SELECT visit_id FROM check_purchase
    )
  GROUP BY ph.product_category
)

SELECT
  cpv.product_category,
  cpv.category_view,
  catc.category_to_cart,
  anb.category_not_buy,
  acb.category_buy
FROM cat_page_view cpv
JOIN cat_add_to_cart catc
  ON cpv.product_category = catc.product_category
JOIN add_to_cart_not_buy anb

```

```

        ON cpv.product_category = anb.product_category
    JOIN add_to_cart_buy acb
        ON cpv.product_category = acb.product_category
    ORDER BY cpv.product_category
);
SELECT * FROM category_analysis

```

Output

	product_category character varying (9) 🔒	category_view bigint 🔒	category_to_cart bigint 🔒	category_not_buy bigint 🔒	category_buy bigint 🔒
1	Fish	4633	2789	674	2115
2	Luxury	3032	1870	466	1404
3	Shellfish	6204	3792	894	2898

8 Câu hỏi 8

Sản phẩm nào có nhiều lượt xem, thêm vào giỏ hàng và mua nhất?

- Lượt xem nhiều nhất

```
SELECT product_id, product_view
FROM product_analysis
ORDER BY product_view DESC
LIMIT 1;
```

Output

	product_id integer	product_view bigint
1	9	1568

- Thêm vào giỏ hàng nhiều nhất

```
SELECT product_id, product_to_cart
FROM product_analysis
ORDER BY product_to_cart DESC
LIMIT 1;
```

Output

	product_id integer	product_to_cart bigint
1	7	968

- Nhiều lượt mua nhất

```
SELECT product_id, product_buy
FROM product_analysis
ORDER BY product_buy DESC
LIMIT 1;
```

Output

	product_id integer	product_buy bigint
1	7	754

9 Câu hỏi 9

Sản phẩm nào có khả năng bị bỏ rơi (thêm vào giỏ hàng nhưng không được mua) nhiều nhất?

```
SELECT product_id, product_not_buy
FROM product_analysis
ORDER BY product_not_buy DESC
LIMIT 1;
```

Output

	product_id integer	product_not_buy bigint
1	4	249

10 Câu hỏi 10

Sản phẩm nào có tỷ lệ phần trăm lượt xem thành mua (view to purchase) cao nhất?

```
SELECT product_id,  
       ROUND(product_buy::numeric / product_view::numeric, 3) AS  
         purchase_ratio  
FROM product_analysis  
ORDER BY ROUND(product_buy::numeric / product_view::numeric, 3)  
        DESC  
LIMIT 1;
```

Output

	product_id integer	purchase_ratio numeric
1	7	0.487

11 Câu hỏi 11

Tỷ lệ chuyển đổi trung bình từ lượt xem thành thêm vào giỏ hàng (from view to cart add) là bao nhiêu?

```
SELECT ROUND(  
       AVG(product_to_cart::numeric / product_view::numeric), 3  
       ) AS to_cart_ratio  
FROM product_analysis;
```

Output


	to_cart_ratio numeric
1	0.610

12 Câu hỏi 12

Tỷ lệ chuyển đổi trung bình từ thêm vào giỏ hàng thành mua (from cart add to purchase) là bao nhiêu?

```
SELECT ROUND(AVG(product_buy::numeric/product_to_cart::numeric), 3)
        AS to_cart_ratio
FROM product_analysis
```

Output

	to_cart_ratio numeric 
1	0.759