1. 情境：將資料進行統整和有效資訊萃取

- **題目1-1：分析每個州的使用者、銷量等基本指標**

```
select customer_state
        , COUNT(distinct customer_unique_id) as cid_cnt
        , COUNT(distinct order_id) order_cnt
        , sum(price) as sales
    FROM `AC_eshop.customer` c
    LEFT JOIN `AC_eshop.order` o USING (customer_id)
    LEFT JOIN `AC_eshop.order_item` oi using (order_id)
    GROUP BY 1
    ORDER BY cid_cnt DESC;
```

列	customer_state	cid_cnt	order_cnt	sales
1	SP	40186	41621	5188099.230001...
2	RJ	12330	12792	1812846.219999...
3	MG	11222	11591	1580496.819999...
4	RS	5252	5441	746162.4000000...
5	PR	4863	5025	681068.2500000...
6	SC	3523	3625	518180.2800000...
7	BA	3273	3376	510455.9400000...
8	DF	2069	2134	301560.1699999...

- **題目1-2: 將州的資料進行更上一層的統整**

```
SELECT
    CASE
        WHEN customer_state in ('AC', 'AM', 'RR', 'RO', 'PA', 'AP', 'TO')
THEN 'North Region'
        WHEN customer_state in ('MT', 'MS', 'GO', 'DF') THEN 'MidWest
Region'
        WHEN customer_state in ('PR', 'SC', 'RS') THEN 'South Region'
        WHEN customer_state in ('SP', 'MG', 'ES', 'RJ') THEN 'SouthEast
Region'
        WHEN customer_state in ('MA', 'PI', 'BA', 'CE', 'RN', 'PB', 'PE',
'SE', 'AL') THEN 'NorthEast Region'
        ELSE 'Brazilian States'
        END AS `Region`,
    COUNT(distinct customer_unique_id) as cid_cnt,
    COUNT(distinct order_id) order_cnt,
    SUM(price) as sales
FROM `AC_eshop.customer` c
LEFT JOIN `AC_eshop.order` o USING (customer_id)
LEFT JOIN `AC_eshop.order_item` oi using (order_id)
GROUP BY 1
ORDER BY cid_cnt DESC;
```

列	Region	cid_cnt	order_cnt	sales
1	SouthEast Region	65690	68033	8855561.790007...
2	South Region	13635	14091	1945410.929999...
3	NorthEast Region	9106	9359	1539480.429999...
4	MidWest Region	5578	5764	868106.1100000...
5	North Region	1788	1845	333153.5199999...

- **題目1-3: 萃取出地區層級的月份資料**

```
SELECT
    CASE
        WHEN customer_state in ('AC', 'AM', 'RR', 'RO', 'PA', 'AP', 'TO')
THEN 'North Region'
        WHEN customer_state in ('MT', 'MS', 'GO', 'DF') THEN 'MidWest
Region'
        WHEN customer_state in ('PR', 'SC', 'RS') THEN 'South Region'
        WHEN customer_state in ('SP', 'MG', 'ES', 'RJ') THEN 'SouthEast
Region'
        WHEN customer_state in ('MA', 'PI', 'BA', 'CE', 'RN', 'PB', 'PE',
'SE', 'AL') THEN 'NorthEast Region'
        ELSE 'Brazilian States'
        END AS `Region`,
    EXTRACT(month from o.order_purchase_timestamp) AS Month,
    COUNT(distinct customer_unique_id) as cid_cnt,
    COUNT(distinct order_id) order_cnt,
    SUM(price) as sales
FROM `AC_eshop.customer` c
LEFT JOIN `AC_eshop.order` o USING (customer_id)
LEFT JOIN `AC_eshop.order_item` oi using (order_id)
WHERE EXTRACT(year from o.order_purchase_timestamp) = 2017
GROUP BY 1,2
ORDER BY cid_cnt DESC;
```

列	Region	Month	cid_cnt	order_cnt	sales
1	SouthEast Region	11	5087	5173	669382.1800000...
2	SouthEast Region	12	3894	3944	504745.6400000...
3	SouthEast Region	10	3070	3121	417551.1400000...
4	SouthEast Region	9	2802	2847	397497.7700000...
5	SouthEast Region	8	2801	2855	350556.1800000...
6	SouthEast Region	7	2655	2711	325319.5199999...
7	SouthEast Region	5	2389	2435	314884.2699999...

- **題目1-4: 將地區和月的資料再次進行更高層級的統整**

```
WITH CTE AS (
SELECT
    CASE
        WHEN customer_state in ('AC', 'AM', 'RR', 'RO', 'PA', 'AP', 'TO')
THEN 'North Region'
        WHEN customer_state in ('MT', 'MS', 'GO', 'DF') THEN 'MidWest
Region'
        WHEN customer_state in ('PR', 'SC', 'RS') THEN 'South Region'
        WHEN customer_state in ('SP', 'MG', 'ES', 'RJ') THEN 'SouthEast
Region'
        WHEN customer_state in ('MA', 'PI', 'BA', 'CE', 'RN', 'PB', 'PE',
'SE', 'AL') THEN 'NorthEast Region'
        ELSE 'Brazilian States'
        END AS `Region`,
    EXTRACT(month from o.order_purchase_timestamp) AS Month,
    COUNT(distinct customer_unique_id) as cid_cnt,
    COUNT(distinct order_id) order_cnt,
    SUM(price) as sales
FROM `AC_eshop.customer` c
LEFT JOIN `AC_eshop.order` o USING (customer_id)
LEFT JOIN `AC_eshop.order_item` oi using (order_id)
WHERE EXTRACT(year from o.order_purchase_timestamp) = 2017
GROUP BY 1,2
)

SELECT Region,
    SUM(CASE WHEN Month in (1,2,3) THEN cid_cnt END) as Q1_cid_cnt,
    SUM(CASE WHEN Month in (1,2,3) THEN order_cnt END) as Q1_order_cnt,
    SUM(CASE WHEN Month in (1,2,3) THEN sales END) as Q1_sales,
    SUM(CASE WHEN Month in (4,5,6) THEN cid_cnt END) as Q2_cid_cnt,
    SUM(CASE WHEN Month in (4,5,6) THEN order_cnt END) as Q2_order_cnt,
    SUM(CASE WHEN Month in (4,5,6) THEN sales END) as Q2_sales,
    SUM(CASE WHEN Month in (7,8,9) THEN cid_cnt END) as Q3_cid_cnt,
    SUM(CASE WHEN Month in (7,8,9) THEN order_cnt END) as Q3_order_cnt,
    SUM(CASE WHEN Month in (7,8,9) THEN sales END) as Q3_sales,
    SUM(CASE WHEN Month in (10,11,12) THEN cid_cnt END) as Q4_cid_cnt,
    SUM(CASE WHEN Month in (10,11,12) THEN order_cnt END) as Q4_order_cnt,
    SUM(CASE WHEN Month in (10,11,12) THEN sales END) as Q4_sales,
FROM CTE
GROUP BY 1
```

列	Region	Q1_cid_cnt	Q1_order_cnt	Q1_sales	Q2_cid_cnt	Q2_order_cnt	Q2_sales
1	SouthEast Region	3469	3528	459160.7899999...	6075	6188	837482.9899999...
2	South Region	796	820	119933.6500000...	1413	1438	189493.6700000...
3	NorthEast Region	490	497	76981.20000000...	941	955	156572.5700000...
4	North Region	143	149	30273.58999999...	227	232	36293.09999999...
5	MidWest Region	264	268	55610.96000000...	522	536	79194.64000000...

2. 情境：品類資料的提取、查詢和季節性的報表資料整理

- **題目2-1：查詢品類銷售相關指標**

```
SELECT p.product_category_name,
       COUNT(DISTINCT customer_unique_id),
       COUNT(DISTINCT order_id) AS order_cnt,
       SUM(price) AS sales
FROM `AC_eshop.customer` c
LEFT JOIN `AC_eshop.order` o USING (customer_id)
LEFT JOIN `AC_eshop.order_item` oi using (order_id)
LEFT JOIN `AC_eshop.product` p using (product_id)
GROUP BY 1
ORDER BY order_cnt DESC;
```

列	product_category_name	f0_	order_cnt	sales
1	bed_bath_table	9140	9412	1036509.690000...
2	health_beauty	8634	8791	1253993.859999...
3	sports_leisure	7496	7701	984715.3300000...
4	computers_accessories	6539	6671	910555.0000000...
5	furniture_decor	6266	6397	723881.7100000...
6	housewares	5812	5875	630961.5900000...
7	watches_gifts	5543	5619	1201645.440000...
8	telephony	4142	4189	323107.9499999...
9	auto	3841	3886	590886.8600000...
10	toys	3819	3861	479481.5100000...
11	cool_stuff	3607	3624	634179.8500000...
12	garden_tools	3484	3513	483896.5800000...
13	perfumery	3095	3132	393436.1700000...
14	baby	2847	2874	410134.7300000...

  - **題目2-1-1: 品類資料空值的處理**

```
SELECT IFNULL(p.product_category_name, 'other'),
    COUNT(DISTINCT customer_unique_id),
    COUNT(DISTINCT order_id) AS order_cnt,
    SUM(price) AS sales
FROM `AC_eshop.customer` c
LEFT JOIN `AC_eshop.order` o USING (customer_id)
LEFT JOIN `AC_eshop.order_item` oi using (order_id)
LEFT JOIN `AC_eshop.product` p using (product_id)
GROUP BY 1
ORDER BY order_cnt DESC;
```

5	furniture_decor	6266	6397	723881.7100000...
6	housewares	5812	5875	630961.5900000...
7	watches_gifts	5543	5619	1201645.440000...
8	telephony	4142	4189	323107.9499999...
9	auto	3841	3886	590886.8600000...
10	toys	3819	3861	479481.5100000...
11	cool_stuff	3607	3624	634179.8500000...
12	garden_tools	3484	3513	483896.5800000...
13	perfumery	3095	3132	393436.1700000...
14	baby	2847	2874	410134.7300000...
15	electronics	2538	2548	158939.7499999...
16	stationery	2296	2311	230943.2299999...
17	other	2193	2210	184983.8699999...
18	fashion_bags_accessories	1790	1855	152304.3399999...

- **題目2-2: 將品類進行更大層級的分類**

```
    SELECT CASE
            WHEN product_category_name in ('health_beauty',
'computers_accessories', 'toys', 'cool_stuff', 'garden_tools', 'drinks',
                                           'perfumery', 'baby', 'auto',
'pet_shop', 'luggage_accessories', 'books_general_interest',
                                           'market_place',
'books_technical', 'food_drink', 'christmas_supplies', 'dvds_blu_ray',
                                           'books_imported',
'party_supplies', 'music', 'flowers', 'diapers_and_hygiene', 'la_cuisine',
                                           'cds_dvds_musicals',
'fashion_childrens_clothes') THEN 'Consumables'

            WHEN product_category_name in ('sports_leisure',
'watches_gifts', 'telephony', 'fashion_bags_accessories',
'musical_instruments', 'fashion_shoes',

'industry_commerce_and_business', 'costruction_tools_garden',
'fashion_underwear_beach', 'fashion_male_clothing',
                                           'tablets_printing_image',
'cine_photo', 'fashio_female_clothing', 'fashion_sport',
'fashion_childrens_clothes') THEN 'Softlines'

            WHEN product_category_name in ('bed_bath_table',
'furniture_decor', 'housewares', 'electronics', 'stationery',
'small_appliances',
                                           'office_furniture',
'consoles_games', 'home_appliances', 'construction_tools_construction',
'home_construction',
                                           'audio', 'air_conditioning',
'kitchen_dining_laundry_garden_furniture', 'construction_tools_lights',
'home_appliances_2',
                                           'fixed_telephony', 'art',
'costruction_tools_garden', 'computers', 'construction_tools_safety',
'signaling_and_security',
                                           'costruction_tools_tools',
'furniture_bedroom', 'small_appliances_home_oven_and_coffee',
```

```
'furniture_mattress_and_upholstery',
                                          'home_comfort_2',
'arts_and_craftmanship') THEN 'Hardlines'
            ELSE 'Other' END AS product_group,
            COUNT(DISTINCT customer_unique_id),
            COUNT(DISTINCT order_id) AS order_cnt,
            SUM(price) AS sales
    FROM `AC_eshop.customer` c
    LEFT JOIN `AC_eshop.order` o USING (customer_id)
    LEFT JOIN `AC_eshop.order_item` oi using (order_id)
    LEFT JOIN `AC_eshop.product` p using (product_id)
    GROUP BY 1
    ORDER BY sales DESC
```

列	product_group	f0_	order_cnt	sales
1	Consumables	40202	40941	5676724.330002...
2	Hardlines	32988	33885	4468913.500000...
3	Softlines	20601	21084	2981475.209999...
4	Other	3624	3661	414599.7399999...

- **題目2-3: 提取區域品類的月份資料**

```
    SELECT
        CASE
            WHEN customer_state in ('AC', 'AM', 'RR', 'RO', 'PA', 'AP',
'TO') THEN 'North Region'
            WHEN customer_state in ('MT', 'MS', 'GO', 'DF') THEN 'MidWest
Region'
            WHEN customer_state in ('PR', 'SC', 'RS') THEN 'South Region'
            WHEN customer_state in ('SP', 'MG', 'ES', 'RJ') THEN 'SouthEast
Region'
            WHEN customer_state in ('MA', 'PI', 'BA', 'CE', 'RN', 'PB',
'PE', 'SE', 'AL') THEN 'NorthEast Region'
            ELSE 'Brazilian States' END AS `Region`,

        CASE
            WHEN product_category_name IS NULL THEN 'Other'
            WHEN product_category_name in ('health_beauty',
'computers_accessories', 'toys', 'cool_stuff', 'garden_tools', 'drinks',
                                           'perfumery', 'baby', 'auto',
'pet_shop', 'luggage_accessories', 'books_general_interest',
                                           'market_place', 'books_technical',
'food_drink', 'christmas_supplies', 'dvds_blu_ray',
                                           'books_imported', 'party_supplies',
'music', 'flowers', 'diapers_and_hygiene', 'la_cuisine',
                                           'cds_dvds_musicals',
'fashion_childrens_clothes') THEN 'Consumables'

            WHEN product_category_name in ('sports_leisure',
'watches_gifts', 'telephony', 'fashion_bags_accessories',
'musical_instruments', 'fashion_shoes',
                                           'industry_commerce_and_business',
```

```
'costruction_tools_garden', 'fashion_underwear_beach',
'fashion_male_clothing',
                                        'tablets_printing_image',
'cine_photo', 'fashio_female_clothing', 'fashion_sport',
'fashion_childrens_clothes') THEN 'Softlines'

            ELSE 'Hardlines' END AS product_family,

        EXTRACT(MONTH FROM order_purchase_timestamp) AS month,
        COUNT(DISTINCT customer_unique_id) AS cid_cnt,
        COUNT(DISTINCT order_id) AS order_cnt,
        SUM(price) AS sales
    FROM `AC_eshop.customer` c
    LEFT JOIN `AC_eshop.order` o USING (customer_id)
    LEFT JOIN `AC_eshop.order_item` oi using (order_id)
    LEFT JOIN `AC_eshop.product` p using (product_id)
    WHERE EXTRACT(YEAR FROM order_purchase_timestamp) = 2017
    GROUP BY Region, month, product_family
```

列	Region	product_family	month	cid_cnt	order_cnt	sales
1	SouthEast Region	Softlines	3	325	329	49242.39000000...
2	SouthEast Region	Consumables	7	1075	1086	136836.6099999...
3	SouthEast Region	Softlines	9	637	641	88999.06999999...
4	SouthEast Region	Consumables	8	1187	1198	149317.1899999...
5	SouthEast Region	Consumables	12	1633	1644	221491.6199999...
6	SouthEast Region	Consumables	5	1031	1037	145630.1699999...
7	SouthEast Region	Consumables	10	1297	1304	163490.0199999...
8	SouthEast Region	Other	7	81	82	2475.580000000...
9	South Region	Hardlines	2	95	97	13714.22999999...
10	South Region	Hardlines	6	180	185	21798.31000000...
11	South Region	Consumables	11	474	476	68862.27000000...
12	South Region	Hardlines	8	227	236	29502.82000000...
13	South Region	Consumables	9	251	254	35417.73000000...
14	South Region	Softlines	2	53	54	7275.749999999...

- **題目2-4: 將地區和月的資料進行更高層級的提取，並且放入年度的季節性**

```
    WITH CTE AS (
        SELECT
            CASE
                WHEN customer_state in ('AC', 'AM', 'RR', 'RO', 'PA', 'AP',
'TO') THEN 'North Region'
                WHEN customer_state in ('MT', 'MS', 'GO', 'DF') THEN
'MidWest Region'
                WHEN customer_state in ('PR', 'SC', 'RS') THEN 'South
Region'
                WHEN customer_state in ('SP', 'MG', 'ES', 'RJ') THEN
'SouthEast Region'
                WHEN customer_state in ('MA', 'PI', 'BA', 'CE', 'RN', 'PB',
'PE', 'SE', 'AL') THEN 'NorthEast Region'
                ELSE 'Brazilian States' END AS `Region`,

            CASE
                WHEN product_category_name IS NULL THEN 'Other'
                WHEN product_category_name in ('health_beauty',
'computers_accessories', 'toys', 'cool_stuff', 'garden_tools', 'drinks',
                                               'perfumery', 'baby', 'auto',
```

```
'pet_shop', 'luggage_accessories', 'books_general_interest',
                                                'market_place',
'books_technical', 'food_drink', 'christmas_supplies', 'dvds_blu_ray',
                                                'books_imported',
'party_supplies', 'music', 'flowers', 'diapers_and_hygiene', 'la_cuisine',
                                                'cds_dvds_musicals',
'fashion_childrens_clothes') THEN 'Consumables'

               WHEN product_category_name in ('sports_leisure',
'watches_gifts', 'telephony', 'fashion_bags_accessories',
'musical_instruments', 'fashion_shoes',

'industry_commerce_and_business', 'costruction_tools_garden',
'fashion_underwear_beach', 'fashion_male_clothing',
                                                'tablets_printing_image',
'cine_photo', 'fashio_female_clothing', 'fashion_sport',
'fashion_childrens_clothes') THEN 'Softlines'
               ELSE 'Hardlines' END AS product_family,
           EXTRACT(year FROM o.order_purchase_timestamp) AS year,
           EXTRACT(quarter FROM o.order_purchase_timestamp) AS quarter,
           COUNT(DISTINCT c.customer_unique_id) AS cid_cnt,
           SUM(price) AS sales
       FROM `AC_eshop.customer` c
       LEFT JOIN `AC_eshop.order` o USING (customer_id)
       LEFT JOIN `AC_eshop.order_item` oi USING (order_id)
       LEFT JOIN `AC_eshop.product` p USING (product_id)
       GROUP BY Region, product_Family, year, quarter
       ORDER BY Region, product_Family, year, quarter
   )
   SELECT product_family,
       SUM(CASE WHEN year = 2017 AND quarter = 1 THEN cid_cnt END) as
Q1_2017_UserCnt,
       SUM(CASE WHEN year = 2017 AND quarter = 1 THEN sales END) as
Q1_2017_Sales,
       SUM(CASE WHEN year = 2017 AND quarter = 2 THEN cid_cnt END) as
Q1_2017_UserCnt,
       SUM(CASE WHEN year = 2017 AND quarter = 2 THEN sales END) as
Q1_2017_Sales,
       SUM(CASE WHEN year = 2017 AND quarter = 3 THEN cid_cnt END) as
Q1_2017_UserCnt,
       SUM(CASE WHEN year = 2017 AND quarter = 3 THEN sales END) as
Q1_2017_Sales,
       SUM(CASE WHEN year = 2017 AND quarter = 4 THEN cid_cnt END) as
Q1_2017_UserCnt,
       SUM(CASE WHEN year = 2017 AND quarter = 4 THEN sales END) as
Q1_2017_Sales,

       SUM(CASE WHEN year = 2018 AND quarter = 1 THEN cid_cnt END) as
Q1_2017_UserCnt,
       SUM(CASE WHEN year = 2018 AND quarter = 1 THEN sales END) as
Q1_2017_Sales,
       SUM(CASE WHEN year = 2018 AND quarter = 2 THEN cid_cnt END) as
Q1_2017_UserCnt,
       SUM(CASE WHEN year = 2018 AND quarter = 2 THEN sales END) as
```

```
Q1_2017_Sales,
        SUM(CASE WHEN year = 2018 AND quarter = 3 THEN cid_cnt END) as
Q1_2017_UserCnt,
        SUM(CASE WHEN year = 2018 AND quarter = 3 THEN sales END) as
Q1_2017_Sales
    FROM CTE
    WHERE Region = 'SouthEast Region'
    GROUP BY 1
    ORDER BY 1
```

列	product_family	Q1_2017_UserCnt	Q1_2017_Sales	Q2_2017_UserCnt	Q2_2017_Sales	Q3_2017_UserCnt	Q3_2017_Sales	Q4_2017_UserCnt	Q4_2017_Sales
1	Consumables	1311	189569.8499999...	2549	386480.7200000...	3412	438029.8900000...	5022	663376.4700000...
2	Hardlines	1398	168217.4299999...	2108	268977.1999999...	2988	409664.0500000...	4142	528105.4700000...
3	Other	161	11008.03999999...	191	14777.21999999...	234	10071.29999999...	364	32478.92000000...
4	Softlines	616	90365.47000000...	1253	167247.8499999...	1675	215608.2299999...	2569	367718.1000000...

Q4_2017_UserCnt	Q4_2017_Sales	Q1_2018_UserCnt	Q1_2018_Sales	Q2_2018_UserCnt	Q2_2018_Sales	Q3_2018_UserCnt	Q3_2018_Sales
5022	663376.4700000...	5826	750099.7400000...	5683	751422.3500000...	3655	448190.6200000...
4142	528105.4700000...	5189	646817.2300000...	5369	729032.7800000...	3583	461586.3900000...
364	32478.92000000...	329	30346.14000000...	112	7740.659999999...	120	7606.729999999...
2569	367718.1000000...	2962	401685.94	2859	417930.9200000...	1696	241406.0799999...

- **題目2-5: 將東南地區的品類線年/季度樞紐分析表狀的結果，加入YoY的變化**

```
    WITH CTE AS (
        SELECT
            CASE
                WHEN customer_state in ('AC', 'AM', 'RR', 'RO', 'PA', 'AP',
'TO') THEN 'North Region'
                WHEN customer_state in ('MT', 'MS', 'GO', 'DF') THEN
'MidWest Region'
                WHEN customer_state in ('PR', 'SC', 'RS') THEN 'South
Region'
                WHEN customer_state in ('SP', 'MG', 'ES', 'RJ') THEN
'SouthEast Region'
                WHEN customer_state in ('MA', 'PI', 'BA', 'CE', 'RN', 'PB',
'PE', 'SE', 'AL') THEN 'NorthEast Region'
                ELSE 'Brazilian States' END AS `Region`,

            CASE
                WHEN product_category_name IS NULL THEN 'Other'
                WHEN product_category_name in ('health_beauty',
'computers_accessories', 'toys', 'cool_stuff', 'garden_tools', 'drinks',
                                               'perfumery', 'baby', 'auto',
'pet_shop', 'luggage_accessories', 'books_general_interest',
                                               'market_place',
'books_technical', 'food_drink', 'christmas_supplies', 'dvds_blu_ray',
                                               'books_imported',
'party_supplies', 'music', 'flowers', 'diapers_and_hygiene', 'la_cuisine',
                                               'cds_dvds_musicals',
'fashion_childrens_clothes') THEN 'Consumables'

                WHEN product_category_name in ('sports_leisure',
'watches_gifts', 'telephony', 'fashion_bags_accessories',
'musical_instruments', 'fashion_shoes',

'industry_commerce_and_business', 'costruction_tools_garden',
```

```
'fashion_underwear_beach', 'fashion_male_clothing',
                                                'tablets_printing_image',
'cine_photo', 'fashio_female_clothing', 'fashion_sport',
'fashion_childrens_clothes') THEN 'Softlines'
                ELSE 'Hardlines' END AS product_family,
            EXTRACT(year FROM o.order_purchase_timestamp) AS year,
            EXTRACT(quarter FROM o.order_purchase_timestamp) AS quarter,
            COUNT(DISTINCT c.customer_unique_id) AS cid_cnt,
            SUM(price) AS sales
        FROM `AC_eshop.customer` c
        LEFT JOIN `AC_eshop.order` o USING (customer_id)
        LEFT JOIN `AC_eshop.order_item` oi USING (order_id)
        LEFT JOIN `AC_eshop.product` p USING (product_id)
        GROUP BY Region, product_Family, year, quarter
        ORDER BY Region, product_Family, year, quarter
    )
    SELECT product_family,
        SUM(CASE WHEN year = 2017 AND quarter = 1 THEN cid_cnt END) AS
Q1_2017_UserCnt,
        SUM(CASE WHEN year = 2018 AND quarter = 1 THEN cid_cnt END) AS
Q1_2018_UserCnt,
        ROUND((SUM(CASE WHEN year = 2018 AND quarter = 1 THEN cid_cnt
END)/SUM(CASE WHEN year = 2017 AND quarter = 1 THEN cid_cnt END)-1), 2) AS
YOY_Q1_UserCnt,

        SUM(CASE WHEN year = 2017 AND quarter = 1 THEN sales END) AS
Q2_2017_Sales,
        SUM(CASE WHEN year = 2018 AND quarter = 1 THEN sales END) AS
Q2_2018_Sales,
        ROUND((SUM(CASE WHEN year = 2018 AND quarter = 1 THEN sales
END)/SUM(CASE WHEN year = 2017 AND quarter = 1 THEN sales END)-1), 2) AS
YOY_Q1_Sales,

        SUM(CASE WHEN year = 2017 AND quarter = 2 THEN cid_cnt END) AS
Q2_2017_UserCnt,
        SUM(CASE WHEN year = 2018 AND quarter = 2 THEN cid_cnt END) AS
Q2_2018_UserCnt,
        ROUND((SUM(CASE WHEN year = 2018 AND quarter = 2 THEN cid_cnt
END)/SUM(CASE WHEN year = 2017 AND quarter = 2 THEN cid_cnt END)-1), 2) AS
YOY_Q2_UserCnt,

        SUM(CASE WHEN year = 2017 AND quarter = 2 THEN sales END) AS
Q2_2017_Sales,
        SUM(CASE WHEN year = 2018 AND quarter = 2 THEN sales END) AS
Q2_2018_Sales,
        ROUND((SUM(CASE WHEN year = 2018 AND quarter = 2 THEN sales
END)/SUM(CASE WHEN year = 2017 AND quarter = 2 THEN sales END)-1), 2) AS
YOY_Q2_Sales,

        SUM(CASE WHEN year = 2017 AND quarter = 3 THEN cid_cnt END) AS
Q3_2017_UserCnt,
        SUM(CASE WHEN year = 2018 AND quarter = 3 THEN cid_cnt END) AS
Q3_2018_UserCnt,
        ROUND((SUM(CASE WHEN year = 2018 AND quarter = 3 THEN cid_cnt
```

```
END)/SUM(CASE WHEN year = 2017 AND quarter = 3 THEN cid_cnt END)-1), 2) AS
YOY_Q3_UserCnt,

        SUM(CASE WHEN year = 2017 AND quarter = 3 THEN sales END) AS
Q3_2017_Sales,
        SUM(CASE WHEN year = 2018 AND quarter = 3 THEN sales END) AS
Q3_2018_Sales,
        ROUND((SUM(CASE WHEN year = 2018 AND quarter = 3 THEN sales
END)/SUM(CASE WHEN year = 2017 AND quarter = 3 THEN sales END)-1), 2) AS
YOY_Q3_Sales,
    FROM CTE
    WHERE Region = 'SouthEast Region'
    GROUP BY 1
    ORDER BY 1
```

列	product_family	Q1_2017_UserCnt	Q1_2018_UserCnt	YOY_Q1_UserCnt	Q2_2017_Sales	Q2_2018_Sales	YOY_Q1_Sales	Q2_2017_UserCnt	Q2_2018_UserCnt	YOY_Q2_UserCnt
1	Consumables	1311	5826	3.44	189569.8499999...	750099.7400000...	2.96	2549	5683	1.23
2	Hardlines	1398	5189	2.71	168217.4299999...	646817.2300000...	2.85	2108	5369	1.55
3	Other	161	329	1.04	11008.03999999...	30346.14000000...	1.76	191	112	-0.41
4	Softlines	616	2962	3.81	90365.47000000...	401685.94	3.45	1253	2859	1.28

Q2_2017_Sales_1	Q2_2018_Sales_1	YOY_Q2_Sales	Q3_2017_UserCnt	Q3_2018_UserCnt	YOY_Q3_UserCnt	Q3_2017_Sales	Q3_2018_Sales	YOY_Q3_Sales
386480.7200000...	751422.3500000...	0.94	3412	3655	0.07	438029.8900000...	448190.6200000...	0.02
268977.1999999...	729032.7800000...	1.71	2988	3583	0.2	409664.0500000...	461586.3900000...	0.13
14777.21999999...	7740.659999999...	-0.48	234	120	-0.49	10071.29999999...	7606.729999999...	-0.24
167247.8499999...	417930.9200000...	1.5	1675	1696	0.01	215608.2299999...	241406.0799999...	0.12

3. 情境：消費者的RFM分析

- **題目3-1-1: Frequency - 找出每個使用者的購買頻率**
- **題目3-1-2: Frequency - 查詢出不同訂單數的使用者人數分布**
- **題目3-2-1: Monetary - 找出每個消費者的花費總數**
- **題目3-3-1: Recency - 找出每個消費者最近的消費，並且計算和今日的天數差**
- **題目3-3-2: 查詢不同消費天數差的分布**
- **題目3-4-1: 針對R/F/M三個查詢指令和結果，將使用者分為高與低的兩群人**
- **題目3-4-2: 將3-4-1查詢結果結合再一起**
- **題目3-4-3: 完成分群！**