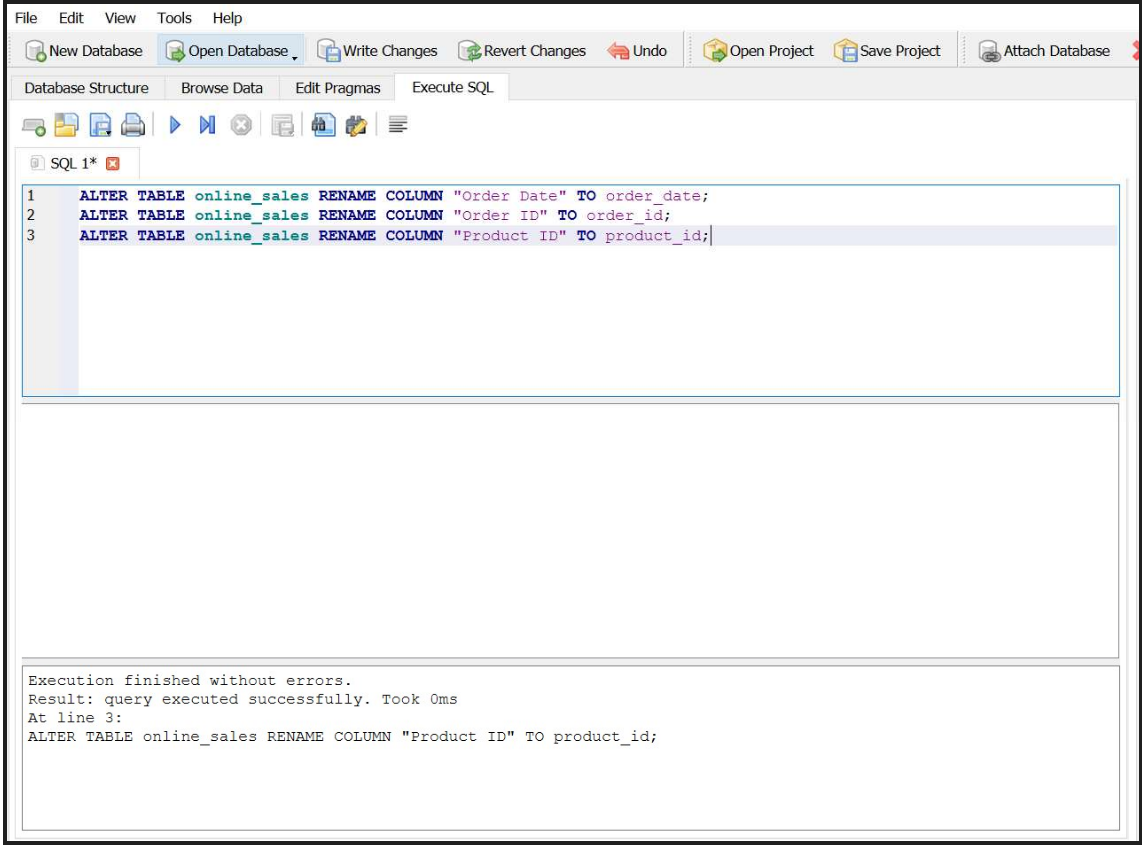
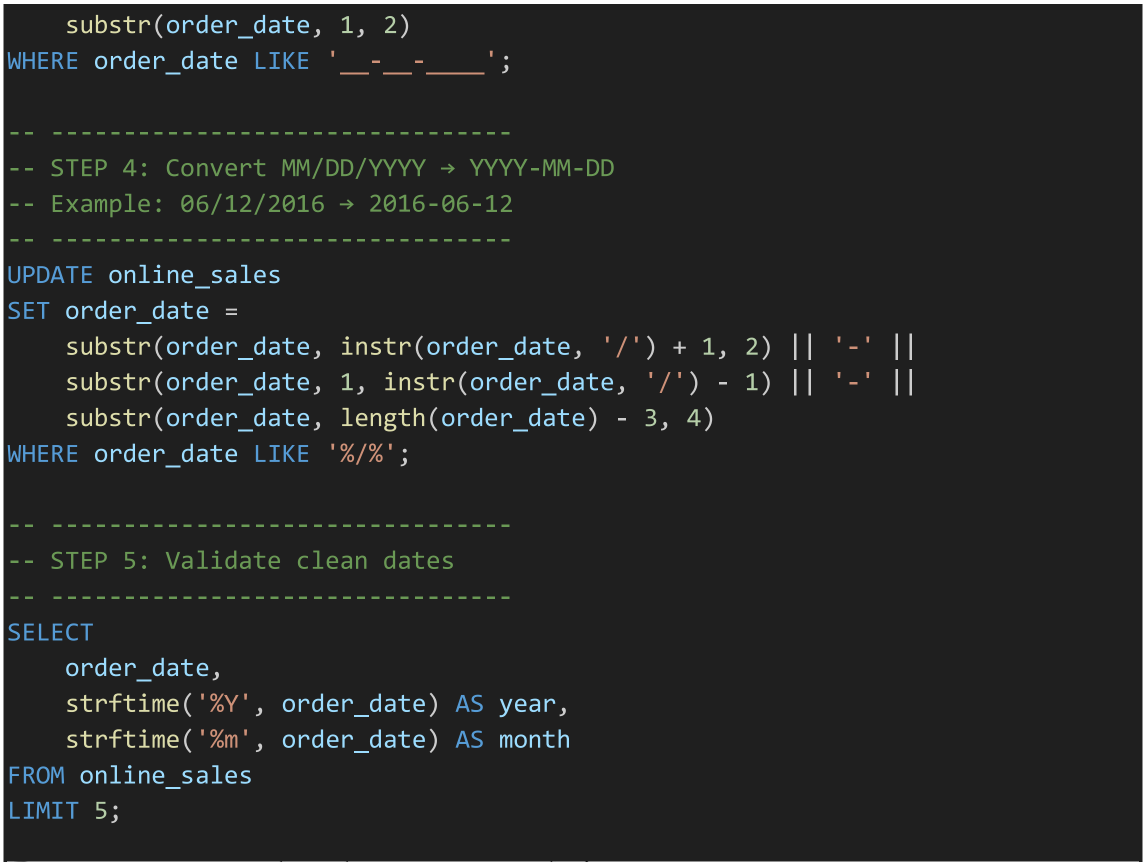
```sql
-- ===============================
--  ONLINE SALES – CLEANING & EDA
-- ===============================

-- -------------------------------
-- STEP 1: Check table structure
-- -------------------------------
PRAGMA table_info(online_sales);

-- -------------------------------
-- STEP 2: Fix column names (if needed)
-- -------------------------------
ALTER TABLE online_sales RENAME COLUMN "Order ID" TO order_id;
ALTER TABLE online_sales RENAME COLUMN "Order Date" TO order_date;
ALTER TABLE online_sales RENAME COLUMN "Product ID" TO product_id;
```



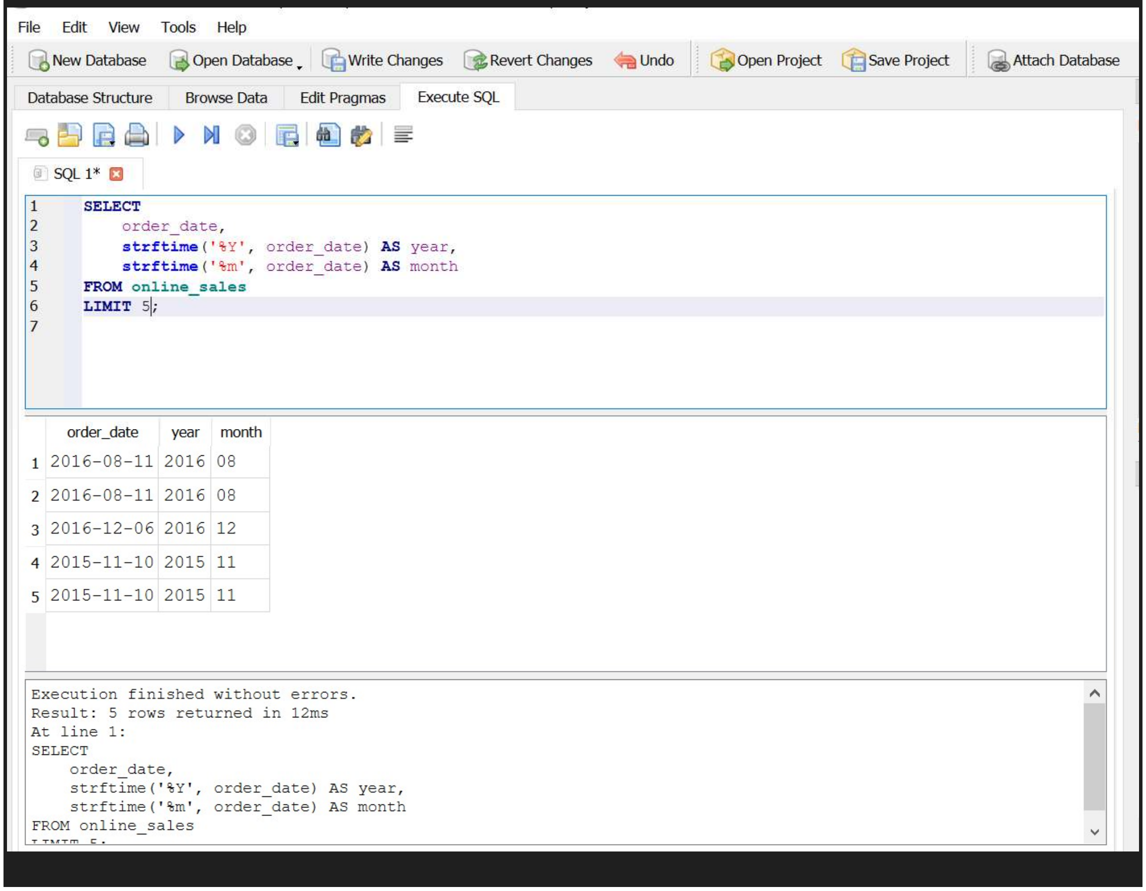
```sql
ALTER TABLE online_sales RENAME COLUMN "Order Date" TO order_date;
ALTER TABLE online_sales RENAME COLUMN "Order ID" TO order_id;
ALTER TABLE online_sales RENAME COLUMN "Product ID" TO product_id;
```

```
Execution finished without errors.
Result: query executed successfully. Took 0ms
At line 3:
ALTER TABLE online_sales RENAME COLUMN "Product ID" TO product_id;
```

```sql
-- -------------------------------
-- STEP 3: Convert DD-MM-YYYY → YYYY-MM-DD
-- Example: 11-08-2016 → 2016-08-11
-- -------------------------------
UPDATE online_sales
SET order_date =
    substr(order_date, 7, 4) || '-' ||
    substr(order_date, 4, 2) || '-' ||
```



```sql
    substr(order_date, 1, 2)
WHERE order_date LIKE '__-__-____';

-- -------------------------------
-- STEP 4: Convert MM/DD/YYYY → YYYY-MM-DD
-- Example: 06/12/2016 → 2016-06-12
-- -------------------------------
UPDATE online_sales
SET order_date =
    substr(order_date, instr(order_date, '/') + 1, 2) || '-' ||
    substr(order_date, 1, instr(order_date, '/') - 1) || '-' ||
    substr(order_date, length(order_date) - 3, 4)
WHERE order_date LIKE '%/%';

-- -------------------------------
-- STEP 5: Validate clean dates
-- -------------------------------
SELECT
    order_date,
    strftime('%Y', order_date) AS year,
    strftime('%m', order_date) AS month
FROM online_sales
LIMIT 5;
```

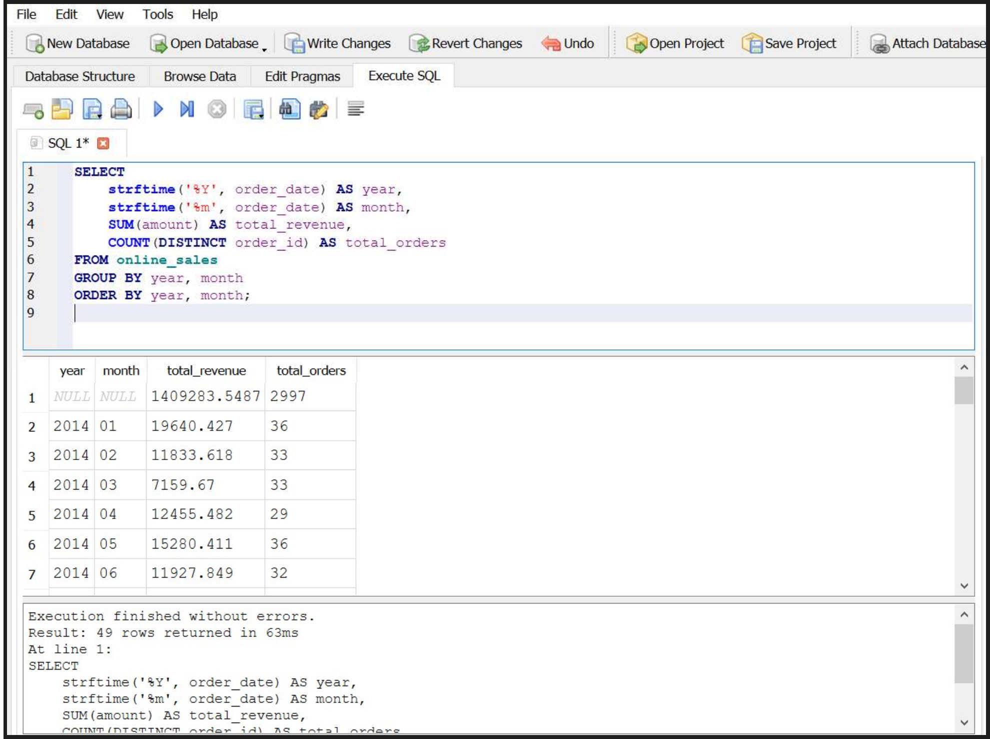


```sql
SELECT
    order_date,
    strftime('%Y', order_date) AS year,
    strftime('%m', order_date) AS month
FROM online_sales
LIMIT 5;
```

	order_date	year	month
1	2016-08-11	2016	08
2	2016-08-11	2016	08
3	2016-12-06	2016	12
4	2015-11-10	2015	11
5	2015-11-10	2015	11

```
Execution finished without errors.
Result: 5 rows returned in 12ms
At line 1:
SELECT
    order_date,
    strftime('%Y', order_date) AS year,
    strftime('%m', order_date) AS month
FROM online_sales
LIMIT 5;
```

```
-- --------------------------------
-- STEP 6: Extract YEAR + MONTH
-- --------------------------------
SELECT
    strftime('%Y', order_date) AS year,
    strftime('%m', order_date) AS month
FROM online_sales
LIMIT 5;

-- --------------------------------
-- STEP 7: Monthly Revenue + Order Volume
-- --------------------------------
SELECT
    strftime('%Y', order_date) AS year,
    strftime('%m', order_date) AS month,
    SUM(amount) AS total_revenue,
    COUNT(DISTINCT order_id) AS total_orders
FROM online_sales
GROUP BY year, month
ORDER BY year, month;
```

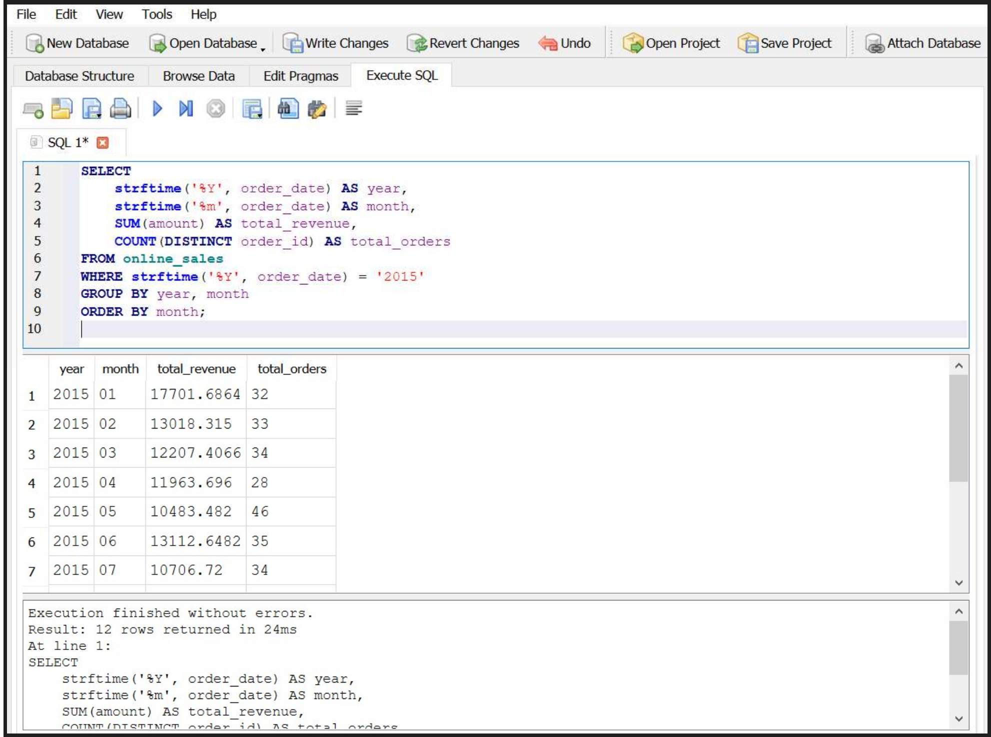


```
SELECT
    strftime('%Y', order_date) AS year,
    strftime('%m', order_date) AS month,
    SUM(amount) AS total_revenue,
    COUNT(DISTINCT order_id) AS total_orders
FROM online_sales
GROUP BY year, month
ORDER BY year, month;
```

	year	month	total_revenue	total_orders
1	NULL	NULL	1409283.5487	2997
2	2014	01	19640.427	36
3	2014	02	11833.618	33
4	2014	03	7159.67	33
5	2014	04	12455.482	29
6	2014	05	15280.411	36
7	2014	06	11927.849	32

```
Execution finished without errors.
Result: 49 rows returned in 63ms
At line 1:
SELECT
    strftime('%Y', order_date) AS year,
    strftime('%m', order_date) AS month,
    SUM(amount) AS total_revenue,
    COUNT(DISTINCT order_id) AS total_orders
```

```
-- --------------------------------
-- STEP 8: Filter by year (example: 2015 only)
-- --------------------------------
SELECT
    strftime('%Y', order_date) AS year,
    strftime('%m', order_date) AS month,
    SUM(amount) AS total_revenue,
    COUNT(DISTINCT order_id) AS total_orders
FROM online_sales
WHERE strftime('%Y', order_date) = '2015'
GROUP BY year, month
ORDER BY month;
```

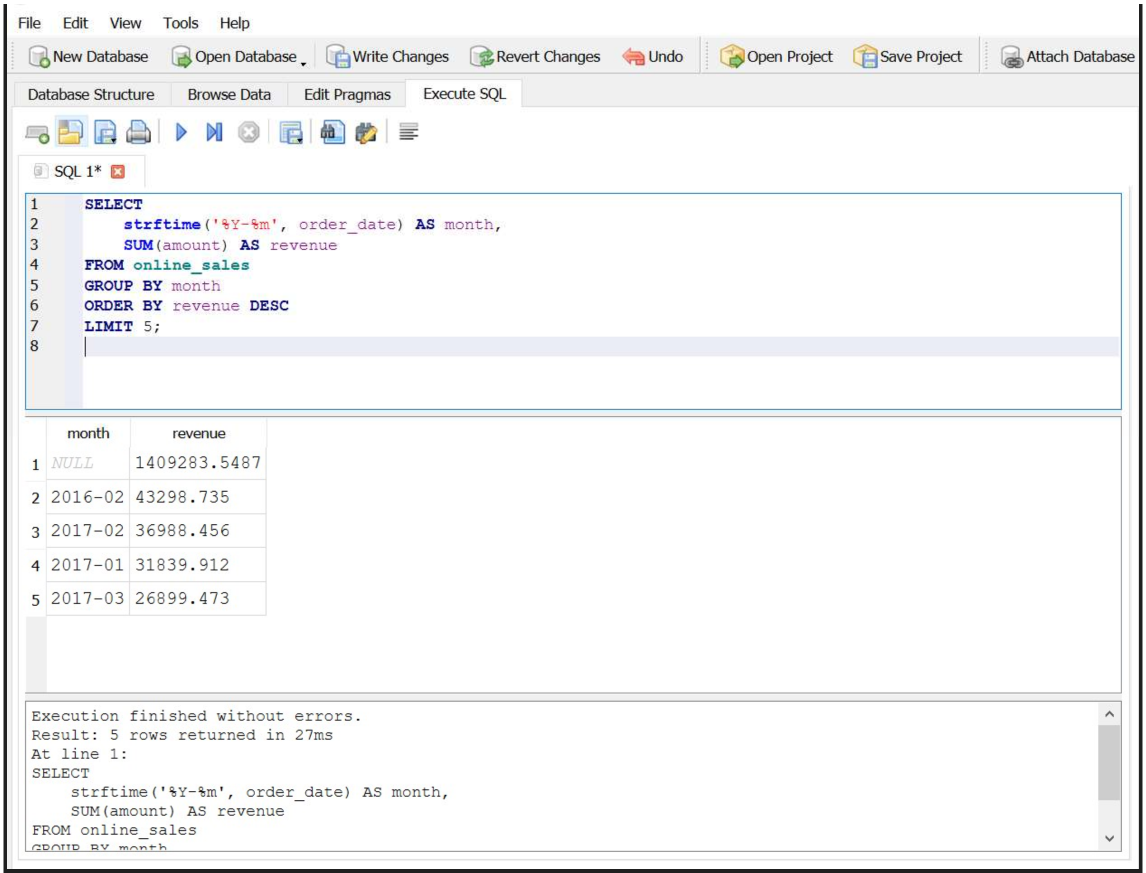


```
SELECT
    strftime('%Y', order_date) AS year,
    strftime('%m', order_date) AS month,
    SUM(amount) AS total_revenue,
    COUNT(DISTINCT order_id) AS total_orders
FROM online_sales
WHERE strftime('%Y', order_date) = '2015'
GROUP BY year, month
ORDER BY month;
```

	year	month	total_revenue	total_orders
1	2015	01	17701.6864	32
2	2015	02	13018.315	33
3	2015	03	12207.4066	34
4	2015	04	11963.696	28
5	2015	05	10483.482	46
6	2015	06	13112.6482	35
7	2015	07	10706.72	34

```
Execution finished without errors.
Result: 12 rows returned in 24ms
At line 1:
SELECT
    strftime('%Y', order_date) AS year,
    strftime('%m', order_date) AS month,
    SUM(amount) AS total_revenue,
    COUNT(DISTINCT order_id) AS total_orders
```

```
-- --------------------------------
-- STEP 9: Top 5 Highest Revenue Months
-- --------------------------------
SELECT
    strftime('%Y-%m', order_date) AS month,
    SUM(amount) AS revenue
FROM online_sales
GROUP BY month
ORDER BY revenue DESC
LIMIT 5;
```



```sql
SELECT
    strftime('%Y-%m', order_date) AS month,
    SUM(amount) AS revenue
FROM online_sales
GROUP BY month
ORDER BY revenue DESC
LIMIT 5;
```

	month	revenue
1	NULL	1409283.5487
2	2016-02	43298.735
3	2017-02	36988.456
4	2017-01	31839.912
5	2017-03	26899.473

```
Execution finished without errors.
Result: 5 rows returned in 27ms
At line 1:
SELECT
    strftime('%Y-%m', order_date) AS month,
    SUM(amount) AS revenue
FROM online_sales
GROUP BY month
```

```sql
-- ================================
-- END OF SCRIPT
-- ================================
```