Sorting Data

Let us understand how to sort the data using **SQL**.

- We typically perform sorting as final step.
- Sorting can be done either by using one field or multiple fields. Sorting by multiple fields is also known as composite sorting.
- We can sort the data either in ascending order or descending order by using column or expression.
- By default, the sorting order is ascending and we can change it to descending by using `DESC`.
- As part of composite sorting, we can sort the data in ascending order on some fields and descending order on other fields.
- Typical query execution order
    1. `FROM`
    2. `WHERE`
    3. `GROUP BY` and `HAVING`
    4. `SELECT`
    5. `ORDER BY`

```
SELECT order_date, count(1) AS order_count
FROM orders
WHERE order_status IN ('COMPLETE', 'CLOSED')
GROUP BY order_date
HAVING count(1) > 50
ORDER BY order_count DESC
```

```
%load_ext sql
```

```
The sql extension is already loaded. To reload it, use:
  %reload_ext sql
```

```
%env
DATABASE_URL=postgresql://itversity_retail_user:retail_password@localhost:5432/itversity_retail
_db
```

```
env:
DATABASE_URL=postgresql://itversity_retail_user:retail_password@localhost:5432/itversity_reta
il_db
```

```
%%sql

SELECT * FROM orders LIMIT 10
```

```
 * postgresql://itversity_retail_user:***@localhost:5432/itversity_retail_db
10 rows affected.
```

order_id	order_date	order_customer_id	order_status
1	2013-07-25 00:00:00	11599	CLOSED
2	2013-07-25 00:00:00	256	PENDING_PAYMENT
3	2013-07-25 00:00:00	12111	COMPLETE
4	2013-07-25 00:00:00	8827	CLOSED
5	2013-07-25 00:00:00	11318	COMPLETE
6	2013-07-25 00:00:00	7130	COMPLETE
7	2013-07-25 00:00:00	4530	COMPLETE
8	2013-07-25 00:00:00	2911	PROCESSING
9	2013-07-25 00:00:00	5657	PENDING_PAYMENT
10	2013-07-25 00:00:00	5648	PENDING_PAYMENT

```
%%sql

SELECT * FROM orders
ORDER BY order_customer_id
LIMIT 10
```

order_id	order_date	order_customer_id	order_status
22945	2013-12-13 00:00:00	1	COMPLETE
33865	2014-02-18 00:00:00	2	COMPLETE
67863	2013-11-30 00:00:00	2	COMPLETE
15192	2013-10-29 00:00:00	2	PENDING_PAYMENT
57963	2013-08-02 00:00:00	2	ON_HOLD
56178	2014-07-15 00:00:00	3	PENDING
57617	2014-07-24 00:00:00	3	COMPLETE
23662	2013-12-19 00:00:00	3	COMPLETE
22646	2013-12-11 00:00:00	3	COMPLETE
35158	2014-02-26 00:00:00	3	COMPLETE

```
%%sql

SELECT * FROM orders
ORDER BY order_customer_id ASC
LIMIT 10
```

order_id	order_date	order_customer_id	order_status
22945	2013-12-13 00:00:00	1	COMPLETE
33865	2014-02-18 00:00:00	2	COMPLETE
67863	2013-11-30 00:00:00	2	COMPLETE
15192	2013-10-29 00:00:00	2	PENDING_PAYMENT
57963	2013-08-02 00:00:00	2	ON_HOLD
56178	2014-07-15 00:00:00	3	PENDING
57617	2014-07-24 00:00:00	3	COMPLETE
23662	2013-12-19 00:00:00	3	COMPLETE
22646	2013-12-11 00:00:00	3	COMPLETE
35158	2014-02-26 00:00:00	3	COMPLETE

```
%%sql

SELECT * FROM orders
ORDER BY order_customer_id,
    order_date
LIMIT 10
```

order_id	order_date	order_customer_id	order_status
22945	2013-12-13 00:00:00	1	COMPLETE
57963	2013-08-02 00:00:00	2	ON_HOLD
15192	2013-10-29 00:00:00	2	PENDING_PAYMENT
67863	2013-11-30 00:00:00	2	COMPLETE
33865	2014-02-18 00:00:00	2	COMPLETE
22646	2013-12-11 00:00:00	3	COMPLETE
61453	2013-12-14 00:00:00	3	COMPLETE
23662	2013-12-19 00:00:00	3	COMPLETE
35158	2014-02-26 00:00:00	3	COMPLETE
46399	2014-05-09 00:00:00	3	PROCESSING

```sql
%%sql

SELECT * FROM orders
ORDER BY order_customer_id,
    order_date DESC
LIMIT 10
```

 * postgresql://itversity_retail_user:***@localhost:5432/itversity_retail_db
10 rows affected.

order_id	order_date	order_customer_id	order_status
22945	2013-12-13 00:00:00	1	COMPLETE
33865	2014-02-18 00:00:00	2	COMPLETE
67863	2013-11-30 00:00:00	2	COMPLETE
15192	2013-10-29 00:00:00	2	PENDING_PAYMENT
57963	2013-08-02 00:00:00	2	ON_HOLD
57617	2014-07-24 00:00:00	3	COMPLETE
56178	2014-07-15 00:00:00	3	PENDING
46399	2014-05-09 00:00:00	3	PROCESSING
35158	2014-02-26 00:00:00	3	COMPLETE
23662	2013-12-19 00:00:00	3	COMPLETE

```sql
%%sql

SELECT o.order_date,
    oi.order_item_product_id,
    round(sum(oi.order_item_subtotal::numeric), 2) AS revenue
FROM orders o JOIN order_items oi
    ON o.order_id = oi.order_item_order_id
WHERE o.order_status IN ('COMPLETE', 'CLOSED')
GROUP BY o.order_date,
    oi.order_item_product_id
ORDER BY o.order_date,
    revenue DESC
LIMIT 25
```

 * postgresql://itversity_retail_user:***@localhost:5432/itversity_retail_db
25 rows affected.

order_date	order_item_product_id	revenue
2013-07-25 00:00:00	1004	5599.72
2013-07-25 00:00:00	191	5099.49
2013-07-25 00:00:00	957	4499.70
2013-07-25 00:00:00	365	3359.44
2013-07-25 00:00:00	1073	2999.85
2013-07-25 00:00:00	1014	2798.88
2013-07-25 00:00:00	403	1949.85
2013-07-25 00:00:00	502	1650.00
2013-07-25 00:00:00	627	1079.73
2013-07-25 00:00:00	226	599.99
2013-07-25 00:00:00	24	319.96
2013-07-25 00:00:00	821	207.96
2013-07-25 00:00:00	625	199.99
2013-07-25 00:00:00	705	119.99
2013-07-25 00:00:00	572	119.97
2013-07-25 00:00:00	666	109.99
2013-07-25 00:00:00	725	108.00
2013-07-25 00:00:00	134	100.00
2013-07-25 00:00:00	906	99.96
2013-07-25 00:00:00	828	95.97
2013-07-25 00:00:00	810	79.96
2013-07-25 00:00:00	926	79.95
2013-07-25 00:00:00	924	79.95
2013-07-25 00:00:00	93	74.97
2013-07-25 00:00:00	835	63.98

```
%%sql

SELECT o.order_date,
    oi.order_item_product_id,
    round(sum(oi.order_item_subtotal::numeric), 2) AS revenue
FROM orders o JOIN order_items oi
    ON o.order_id = oi.order_item_order_id
WHERE o.order_status IN ('COMPLETE', 'CLOSED')
GROUP BY o.order_date,
    oi.order_item_product_id
HAVING round(sum(oi.order_item_subtotal::numeric), 2) >= 1000
ORDER BY o.order_date,
    revenue DESC
LIMIT 10
```

```
 * postgresql://itversity_retail_user:***@localhost:5432/itversity_retail_db
10 rows affected.
```

order_date	order_item_product_id	revenue
2013-07-25 00:00:00	1004	5599.72
2013-07-25 00:00:00	191	5099.49
2013-07-25 00:00:00	957	4499.70
2013-07-25 00:00:00	365	3359.44
2013-07-25 00:00:00	1073	2999.85
2013-07-25 00:00:00	1014	2798.88
2013-07-25 00:00:00	403	1949.85
2013-07-25 00:00:00	502	1650.00
2013-07-25 00:00:00	627	1079.73
2013-07-26 00:00:00	1004	10799.46

```sql
%%sql

DROP TABLE IF EXISTS users
```

```
 * postgresql://itversity_retail_user:***@localhost:5432/itversity_retail_db
Done.
```

```
[]
```

```sql
%%sql

CREATE TABLE users (
    user_id SERIAL PRIMARY KEY,
    user_first_name VARCHAR(30) NOT NULL,
    user_last_name VARCHAR(30) NOT NULL,
    user_email_id VARCHAR(50) NOT NULL,
    user_email_validated BOOLEAN DEFAULT FALSE,
    user_password VARCHAR(200),
    user_role VARCHAR(1) NOT NULL DEFAULT 'U', --U and A
    user_country VARCHAR(2),
    is_active BOOLEAN DEFAULT FALSE,
    create_ts TIMESTAMP DEFAULT CURRENT_TIMESTAMP,
    last_updated_ts TIMESTAMP DEFAULT CURRENT_TIMESTAMP
);
```

```
 * postgresql://itversity_retail_user:***@localhost:5432/itversity_retail_db
Done.
```

```
[]
```

```sql
%%sql

INSERT INTO users (user_first_name, user_last_name, user_email_id, user_country)
VALUES ('Donald', 'Duck', 'donald@duck.com', 'IN')
```

```
 * postgresql://itversity_retail_user:***@localhost:5432/itversity_retail_db
1 rows affected.
```

```
[]
```

```sql
%%sql

INSERT INTO users (user_first_name, user_last_name, user_email_id, user_role, is_active,
user_country)
VALUES ('Mickey', 'Mouse', 'mickey@mouse.com', 'U', true, 'US')
```

```
 * postgresql://itversity_retail_user:***@localhost:5432/itversity_retail_db
1 rows affected.
```

```
[]
```

```
%%sql

INSERT INTO users
    (user_first_name, user_last_name, user_email_id, user_password, user_role, is_active,
user_country)
VALUES
    ('Gordan', 'Bradock', 'gbradock0@barnesandnoble.com', 'h9LAz7p7ub', 'U', true, 'CA'),
    ('Tobe', 'Lyness', 'tlyness1@paginegialle.it', 'oEofndp', 'U', true, 'FR'),
    ('Addie', 'Mesias', 'amesias2@twitpic.com', 'ih7Y69u56', 'U', true, 'AU')
```

 * postgresql://itversity_retail_user:***@localhost:5432/itversity_retail_db
3 rows affected.

[]

```
%%sql

SELECT * FROM users
ORDER BY user_country
```

 * postgresql://itversity_retail_user:***@localhost:5432/itversity_retail_db
5 rows affected.

user_id	user_first_name	user_last_name	user_email_id	user_email_validated
5	Addie	Mesias	amesias2@twitpic.com	False
3	Gordan	Bradock	gbradock0@barnesandnoble.com	False
4	Tobe	Lyness	tlyness1@paginegialle.it	False
1	Donald	Duck	donald@duck.com	False
2	Mickey	Mouse	mickey@mouse.com	False

```
%%sql

SELECT user_id,
    user_first_name,
    user_last_name,
    user_email_id,
    user_country
FROM users
ORDER BY
    CASE WHEN user_country = 'US' THEN 0
        ELSE 1
    END, user_country
```

 * postgresql://itversity_retail_user:***@localhost:5432/itversity_retail_db
5 rows affected.

user_id	user_first_name	user_last_name	user_email_id	user_country
2	Mickey	Mouse	mickey@mouse.com	US
5	Addie	Mesias	amesias2@twitpic.com	AU
3	Gordan	Bradock	gbradock0@barnesandnoble.com	CA
4	Tobe	Lyness	tlyness1@paginegialle.it	FR
1	Donald	Duck	donald@duck.com	IN