The ORDER BY clause
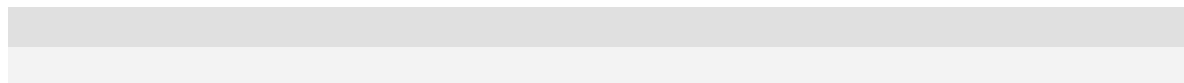
The ORDER BY clause is useful when you want to sort or order the results obtained when running a SQL SELECT query.Data in a database become more meaningful when they are ordered or sorted in a specific order. Ordered data helps people make more accurate business decisions effectively and efficiently.
In SQL, there's the ORDER BY clause that can help you achieve this. If you run a SQL SELECT query, you get a set of unsorted results. If you want to sort them, you need to add the special ORDER BY clause into the SQL SELECT statement.
It can be used after the FROM clause as in:

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```
ORDER BY <order by column name>;
FROM Employee
SELECT *
```

After the ORDER BY keyword, you need to specify the column name based on the data that needs to be sorted. Optionally, you can specify the keywords ASC or DESC after the column name. This is to indicate if the ordering should be in ascending or descending order. Ascending and descending order are the two main types of ordering. If ASC or DESC are not specified, the data is sorted by default in ascending order. The ASC and DESC keywords sort the data based on the order by column, taking into consideration the data type of column or field, namely integer, numeric, text and dates.

Working with the ORDER BY clause
Let's review some example scenarios that use the ORDER BY clause using the tables in the sample database. You can give SQL SELECT statements using the ORDER BY clause with ASC and DESC keywords as required for these scenarios.
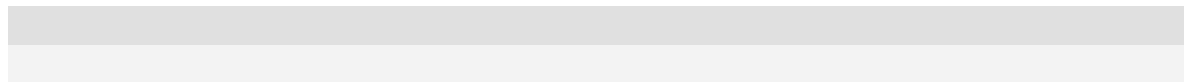
Sorting by a single column

In the customer table, the data is sorted by default in ascending order within the customer ID field. The customer ID field is numeric, so the data is sorted in ascending numeric order. Now let's examine how to order this data in the descending order of the Customer ID field.

To do this, you can run the following query:

```
SELECT *
FROM customers
ORDER BY CustomerId DESC;
```

R

```
+-----------+----------+------------+---------
+---------------------------------------+-------------+--------
+--------------+----------+-------------------+------
+---------------------------+-------------+
| CustomerId | FirstName | LastName    | Company | Address
| City       |   State | Country      | PostalCode | Phone
|  Fax | Email                          | SupportRepId |
+-----------+----------+------------+---------
+---------------------------------------+-------------+--------
+--------------+----------+-------------------+------
+---------------------------+-------------+
|         59 | Puja      | Srivastava  |    None | 3,Raj Bhavan Road
| Bangalore  |    None | India        | 560001     | +91 080
22289999    | None | puja_srivastava@yahoo.in    |            3 |
```

58	Manoj	Pareek	None	12,Community Centre	Delhi	None	India	110017	+91 0124 39883988	None	manoj.pareek@rediff.com	3
57	Luis	Rojas	None	Calle Lira, 198	Santiago	None	Chile	None	+56 (0)2 635 4444	None	luisrojas@yahoo.cl	5
56	Diego	Gutiérrez	None	307 Macacha Güemes	Buenos Aires	None	Argentina	1106	+54 (0)11 4311 4333	None	diego.gutierrez@yahoo.ar	4
55	Mark	Taylor	None	421 Bourke Street	Sidney	NSW	Australia	2010	+61 (02) 9332 3633	None	mark.taylor@yahoo.au	4
54	Steve	Murray	None	110 Raeburn Pl	Edinburgh	None	United Kingdom	EH4 1HH	+44 0131 315 3300	None	steve.murray@yahoo.uk	5
53	Phil	Hughes	None	113 Lupus St	London	None	United Kingdom	SW1V 3EN	+44 020 7976 5722	None	phil.hughes@gmail.com	3
52	Emma	Jones	None	202 Hoxton Street	London	None	United Kingdom	N1 5LH	+44 020 7707 0707	None	emma_jones@hotmail.com	3
51	Joakim	Johansson	None	Celsiusg. 9	Stockholm	None	Sweden	11230	+46 08-651 52 52	None	joakim.johansson@yahoo.se	5
50	Enrique	Muñoz	None	C/ San Bernardo 85	Madrid	None	Spain	28015	+34 914 454 454	None	enrique_munoz@yahoo.es	5
49	Stanisław	Wójcik	None	Ordynacka 10	Warsaw	None	Poland	00-358	+48 22 828 37 39	None	stanisław.wójcik@wp.pl	4
48	Johannes	Van der Berg	None	Lijnbaansgracht 120bg	Amsterdam	VV	Netherlands	1016	+31 020 6223130	None	johavanderberg@yahoo.nl	5
47	Lucas	Mancini	None	Via Degli Scipioni, 43	Rome	RM	Italy	00192	+39 06 39733434	None	lucas.mancini@yahoo.it	5
46	Hugh	O'Reilly	None	3 Chatham Street	Dublin	Dublin	Ireland	None	+353 01 6792424	None	hughoreilly@apple.ie	3
45	Ladislav	Kovács	None	Erzsébet krt. 58.	Budapest	None	Hungary	H-1073	None	None	ladislav_kovacs@apple.hu	3
44	Terhi	Hämäläinen	None	Porthaninkatu 9	Helsinki	None	Finland	00530	+358 09 870 2000	None	terhi.hamalainen@apple.fi	3

```
|          43 | Isabelle  | Mercier      |    None | 68, Rue Jouvence
| Dijon       |    None | France       | 21000        | +33 03 80 73 66
99  | None | isabelle_mercier@apple.fr   |            3 |
|          42 | Wyatt     | Girard       |    None | 9, Place Louis
Barthou                    | Bordeaux    |    None | France        |
33000        | +33 05 56 96 96 96  | None | wyatt.girard@yahoo.fr      |
3 |
|          41 | Marc      | Dubois       |    None | 11, Place Bellecour
| Lyon        |    None | France       | 69002        | +33 04 78 30 30
30  | None | marc.dubois@hotmail.com     |            5 |
|          40 | Dominique | Lefebvre     |    None | 8, Rue Hanovre
| Paris       |    None | France       | 75002        | +33 01 47 42 71
71  | None | dominiquelefebvre@gmail.com |            4 |
|          39 | Camille   | Bernard      |    None | 4, Rue Milton
| Paris       |    None | France       | 75009        | +33 01 49 70 65
65  | None | camille.bernard@yahoo.fr    |            4 |
|          38 | Niklas    | Schröder     |    None | Barbarossastraße 19
| Berlin      |    None | Germany      | 10779        | +49 030 2141444
| None | nschroder@surfeu.de          |         3 |
|          37 | Fynn      | Zimmermann   |    None | Berger Straße 10
| Frankfurt   |    None | Germany      | 60316        | +49 069
40598889     | None | fzimmermann@yahoo.de         |            3 |
|          36 | Hannah    | Schneider    |    None | Tauentzienstraße 8
| Berlin      |    None | Germany      | 10789        | +49 030
26550280     | None | hannah.schneider@yahoo.de   |            5 |
|          35 | Madalena  | Sampaio      |    None | Rua dos Campeões
Europeus de Viena, 4350 | Porto      |    None | Portugal      | None
| +351 (225) 022-448  | None | masampaio@sapo.pt          |
4 |
+------------+-----------+-------------+---------
+----------------------------------------+-------------+--------
+--------------+-----------+-------------------+------
+---------------------------+-------------+
(Output limit exceeded, 25 of 59 total rows shown)
```

In the output, the records are sorted in descending order (largest to smallest) of the CustomerIdwhich has a numeric data type.

Now let's examine how sorting happens for a text data typed column. Consider sorting the data by the City column which has a text data type of VARCHAR. If you want to sort the customer data by city, use the following SELECT statement:

```
SELECT *
FROM customers
ORDER BY City;
```

Run

An ordering method like ASC or DESC wasn't specified in the ORDER BY clause. So, by default, the ordering happens in ascending order.
If you review the City column, you'll notice that the data is sorted in ascending alphabetical order (A to Z).
Let's now run the following SELECT statement:

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```
SELECT *
FROM customers
ORDER BY City DESC;
```

```
+-----------+----------+------------
+-------------------------------------------------
+-----------------------------------------+------------------
+-------+-------------+----------+------------------
+-------------------+-----------------------------+-------------+
| CustomerId | FirstName | LastName    |
Company | Address                                  | City
| State | Country      | PostalCode | Phone             |
Fax | Email                        | SupportRepId |
+-----------+----------+------------
+-------------------------------------------------
+-----------------------------------------+------------------
+-------+-------------+----------+------------------
+-------------------+-----------------------------+-------------+
|         33 | Ellie     | Sullivan    |
None | 5112 48 Street                          | Yellowknife       |
NT    | Canada       | X1A 1N6    | +1 (867) 920-2233 |
None | ellie.sullivan@shaw.ca       |          3 |
|         32 | Aaron     | Mitchell    |
None | 696 Osborne Street                      | Winnipeg          |
MB    | Canada       | R3L 2B9    | +1 (204) 452-6452 |
None | aaronmitchell@yahoo.ca       |          4 |
|         49 | Stanisław | Wójcik      |
None | Ordynacka 10                            | Warsaw            |
None  | Poland       | 00-358     | +48 22 828 37 39  |
None | stanisław.wójcik@wp.pl       |          4 |
|          7 | Astrid    | Gruber      |
None | Rotenturmstraße 4, 1010 Innere Stadt    | Vienne            |
None  | Austria      | 1010       | +43 01 5134505    |
None | astrid.gruber@apple.at       |          5 |
|         15 | Jennifer  | Peterson    |
Rogers Canada | 700 W Pender Street               | Vancouver
| BC    | Canada       | V6C 1G8    | +1 (604) 688-2255 |  +1 (604)
688-8756 | jenniferp@rogers.ca          |          3 |
|         27 | Patrick   | Gray        |
None | 1033 N Park Ave                         | Tucson            |
AZ    | USA          | 85719      | +1 (520) 622-4200 |
None | patrick.gray@aol.com         |          4 |
|         29 | Robert    | Brown       |
```

			None	796 Dundas Street West	Toronto	ON	Canada	M6J 1V1	+1 (416) 363-8888	None	robbrown@shaw.ca	3
10	Eduardo	Martins	Woodstock Discos	Rua Dr. Falcão Filho, 155	São Paulo	SP	Brazil	01007-010	+55 (11) 3033-5446	+55 (11) 3033-4564	eduardo@woodstock.com.br	4
11	Alexandre	Rocha	Banco do Brasil S.A.	Av. Paulista, 2022	São Paulo	SP	Brazil	01310-200	+55 (11) 3055-3278	+55 (11) 3055-8131	alero@uol.com.br	5
1	Luís	Gonçalves	Embraer - Empresa Brasileira de Aeronáutica S.A.	Av. Brigadeiro Faria Lima, 2170	São José dos Campos	SP	Brazil	12227-000	+55 (12) 3923-5555	+55 (12) 3923-5566	luisg@embraer.com.br	3
2	Leonie	Köhler	None	Theodor-Heuss-Straße 34	Stuttgart	None	Germany	70174	+49 0711 2842222	None	leonekohler@surfeu.de	5
51	Joakim	Johansson	None	Celsiusg. 9	Stockholm	None	Sweden	11230	+46 08-651 52 52	None	joakim.johansson@yahoo.se	5
55	Mark	Taylor	None	421 Bourke Street	Sidney	NSW	Australia	2010	+61 (02) 9332 3633	None	mark.taylor@yahoo.au	4
57	Luis	Rojas	None	Calle Lira, 198	Santiago	None	Chile	None	+56 (0)2 635 4444	None	luisrojas@yahoo.cl	5
28	Julia	Barnett	None	302 S 700 E	Salt Lake City	UT	USA	84102	+1 (801) 531-7272	None	jubarnett@gmail.com	5
47	Lucas	Mancini	None	Via Degli Scipioni, 43	Rome	RM	Italy	00192	+39 06 39733434	None	lucas.mancini@yahoo.it	5
12	Roberto	Almeida	Riotur	Praça Pio X, 119	Rio de Janeiro	RJ	Brazil	20040-020	+55 (21) 2271-7000	+55 (21) 2271-7070	roberto.almeida@riotur.gov.br	3
21	Kathy	Chase	None	801 W 4th Street	Reno							

```
NV     | USA               | 89503        | +1 (775) 223-7665  |
None | kachase@hotmail.com               |           5 |
|          17 | Jack       | Smith      |
Microsoft Corporation | 1 Microsoft Way                        |
Redmond              | WA    | USA          | 98052-8300 | +1 (425)
882-8080  | +1 (425) 882-8081 | jacksmith@microsoft.com     |
5 |
|          5 | František | Wichterlová |
JetBrains s.r.o. | Klanova 9/506                       | Prague
| None   | Czech Republic | 14700       | +420 2 4172 5555   |   +420 2
4172 5555 | frantisekw@jetbrains.com        |           4 |
|          6 | Helena     | Holý       |
None | Rilská 3174/6                             | Prague           |
None  | Czech Republic | 14300       | +420 2 4177 0449    |
None | hholy@gmail.com                   |           5 |
|          35 | Madalena  | Sampaio    |
None | Rua dos Campeões Europeus de Viena, 4350 | Porto          |
None  | Portugal       | None       | +351 (225) 022-448 |
None | masampaio@sapo.pt                 |           4 |
|          39 | Camille   | Bernard    |
None | 4, Rue Milton                             | Paris            |
None  | France         | 75009      | +33 01 49 70 65 65 |
None | camille.bernard@yahoo.fr         |           4 |
|          40 | Dominique | Lefebvre   |
None | 8, Rue Hanovre                            | Paris            |
None  | France         | 75002      | +33 01 47 42 71 71 |
None | dominiquelefebvre@gmail.com     |           4 |
|          30 | Edward    | Francis    |
None | 230 Elgin Street                          | Ottawa           |
ON    | Canada         | K2P 1L7    | +1 (613) 234-3322  |
None | edfrancis@yachoo.ca               |           3 |
+-----------+----------+------------
+-------------------------------------------------
+-----------------------------------------+-------------------
+-------+-------------+----------+------------------
+-------------------+------------------------------+-------------+
(Output limit exceeded, 25 of 59 total rows shown)
```

Now you'll notice that the records are ordered in descending alphabetical order (Z to A). Let's examine another example of how data is ordered in a sort column that uses a DATE type field. This example uses the invoices table in the sample database. You can use the following SQL SELECT statement to sort the data by the invoice date column:

```
SELECT *
FROM invoices
ORDER BY InvoiceDate;
```

Run

If you review the InvoiceDate column, you'll notice that the date values are sorted from smallest to largest. That is, they're sorted in ascending order, which is the default sort order.Now let's try running this query with the DESC keyword added in the ORDER BY clause.

1
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```
SELECT *
FROM invoices
ORDER BY InvoiceDate DESC;
```

InvoiceId	CustomerId	InvoiceDate	BillingAddress	BillingCity	BillingState	BillingCountry	BillingPostalCode	Total
412	58	2013-12-22 00:00:00	12,Community Centre	Delhi	None	India	110017	1.99
411	44	2013-12-14 00:00:00	Porthaninkatu 9	Helsinki	None	Finland	00530	13.86
410	35	2013-12-09 00:00:00	Rua dos Campeões Europeus de Viena, 4350	Porto	None	Portugal	None	8.91
409	29	2013-12-06 00:00:00	796 Dundas Street West	Toronto	ON	Canada	M6J 1V1	5.94
408	25	2013-12-05 00:00:00	319 N. Frances Street	Madison	WI	USA	53703	3.96
406	21	2013-12-04 00:00:00	801 W 4th Street	Reno	NV	USA	89503	1.98
407	23	2013-12-04 00:00:00	69 Salem Street	Boston	MA	USA	2113	1.98
405	20	2013-11-21 00:00:00	541 Del Medio Avenue	Mountain View	CA	USA	94040-111	0.99
404	6	2013-11-13 00:00:00	Rilská 3174/6	Prague	None	Czech Republic	14300	25.86
403	56	2013-11-08 00:00:00	307 Macacha Güemes	Buenos Aires	None	Argentina	1106	

8.91 |

Id		InvoiceDate	BillingAddress	BillingCity				Total
402	50	2013-11-05 00:00:00	C/ San Bernardo 85	Madrid	None	Spain	28015	5.94
401	46	2013-11-04 00:00:00	3 Chatham Street	Dublin	Dublin	Ireland	None	3.96
399	42	2013-11-03 00:00:00	9, Place Louis Barthou	Bordeaux	None	France	33000	1.98
400	44	2013-11-03 00:00:00	Porthaninkatu 9	Helsinki	None	Finland	00530	1.98
398	41	2013-10-21 00:00:00	11, Place Bellecour	Lyon	None	France	69002	0.99
397	27	2013-10-13 00:00:00	1033 N Park Ave	Tucson	AZ	USA	85719	13.86
396	18	2013-10-08 00:00:00	627 Broadway	New York	NY	USA	10012-2612	8.91
395	12	2013-10-05 00:00:00	Praça Pio X, 119	Rio de Janeiro	RJ	Brazil	20040-020	5.94
394	8	2013-10-04 00:00:00	Grétrystraat 63	Brussels	None	Belgium	1000	3.96
392	4	2013-10-03 00:00:00	Ullevålsveien 14	Oslo	None	Norway	0171	1.98
393	6	2013-10-03 00:00:00	Rilská 3174/6	Prague	None	Czech Republic	14300	1.98
391	3	2013-09-20 00:00:00	1498 rue Bélanger	Montréal	QC	Canada	H2G 1A7	0.99
390	48	2013-09-12 00:00:00	Lijnbaansgracht 120bg	Amsterdam	VV	Netherlands	1016	13.86
389	39	2013-09-07 00:00:00	4, Rue Milton	Paris	None	France	75009	8.91
388	33	2013-09-04 00:00:00	5112 48 Street	Yellowknife	NT	Canada	X1A 1N6	5.94

+----------+-----------+--------------------

```
+---------------------------------------+---------------
+-------------+---------------+------------------+-------+
```
(Output limit exceeded, 25 of 412 total rows shown)

The data is now sorted from the largest to smallest date, which is descending order.

Ordering by multiple columns
You can also sort data by multiple columns and apply different sort orders to them. Let's say
you want to sort invoice data by both billing city and invoice date. To do this, run the
following query:

```sql
SELECT *
FROM invoices
ORDER BY BillingCity ASC, InvoiceDate DESC;
```

```
+----------+------------+-------------------+---------------------
+------------+-------------+--------------+------------------
+-------+
| InvoiceId | CustomerId | InvoiceDate       | BillingAddress
| BillingCity | BillingState | BillingCountry | BillingPostalCode |
Total |
+----------+------------+-------------------+---------------------
+------------+-------------+--------------+------------------
+-------+
|       390 |         48 | 2013-09-12 00:00:00 | Lijnbaansgracht 120bg
| Amsterdam   | VV          | Netherlands    | 1016             |
13.86 |
|       379 |         48 | 2013-08-02 00:00:00 | Lijnbaansgracht 120bg
| Amsterdam   | VV          | Netherlands    | 1016             |
1.98 |
|       258 |         48 | 2012-02-09 00:00:00 | Lijnbaansgracht 120bg
| Amsterdam   | VV          | Netherlands    | 1016             |
0.99 |
|       206 |         48 | 2011-06-21 00:00:00 | Lijnbaansgracht 120bg
| Amsterdam   | VV          | Netherlands    | 1016             |
8.94 |
|       184 |         48 | 2011-03-19 00:00:00 | Lijnbaansgracht 120bg
| Amsterdam   | VV          | Netherlands    | 1016             |
3.96 |
|       161 |         48 | 2010-12-15 00:00:00 | Lijnbaansgracht 120bg
| Amsterdam   | VV          | Netherlands    | 1016             |
1.98 |
|        32 |         48 | 2009-05-10 00:00:00 | Lijnbaansgracht 120bg
| Amsterdam   | VV          | Netherlands    | 1016             |
```

8.91								
284	59	2012-05-30 00:00:00	3,Raj Bhavan Road	Bangalore	None	India	560001	8.91
229	59	2011-09-30 00:00:00	3,Raj Bhavan Road	Bangalore	None	India	560001	13.86
218	59	2011-08-20 00:00:00	3,Raj Bhavan Road	Bangalore	None	India	560001	1.98
97	59	2010-02-26 00:00:00	3,Raj Bhavan Road	Bangalore	None	India	560001	1.99
45	59	2009-07-08 00:00:00	3,Raj Bhavan Road	Bangalore	None	India	560001	5.94
23	59	2009-04-05 00:00:00	3,Raj Bhavan Road	Bangalore	None	India	560001	3.96
321	36	2012-11-14 00:00:00	Tauentzienstraße 8	Berlin	None	Germany	10789	0.99
291	38	2012-06-30 00:00:00	Barbarossastraße 19	Berlin	None	Germany	10779	8.91
269	36	2012-03-26 00:00:00	Tauentzienstraße 8	Berlin	None	Germany	10789	5.94
247	36	2011-12-23 00:00:00	Tauentzienstraße 8	Berlin	None	Germany	10789	3.96
236	38	2011-10-31 00:00:00	Barbarossastraße 19	Berlin	None	Germany	10779	13.86
224	36	2011-09-20 00:00:00	Tauentzienstraße 8	Berlin	None	Germany	10789	1.98
225	38	2011-09-20 00:00:00	Barbarossastraße 19	Berlin	None	Germany	10779	1.98
104	38	2010-03-29 00:00:00	Barbarossastraße 19	Berlin	None	Germany	10779	0.99
95	36	2010-02-13 00:00:00	Tauentzienstraße 8	Berlin	None	Germany	10789	8.91
52	38	2009-08-08 00:00:00	Barbarossastraße 19

```
| Berlin      | None         | Germany       | 10779             |
5.94 |
|          40 |          36 | 2009-06-15 00:00:00 | Tauentzienstraße 8
| Berlin      | None         | Germany       | 10789             |
13.86 |
|          30 |          38 | 2009-05-06 00:00:00 | Barbarossastraße 19
| Berlin      | None         | Germany       | 10779             |
3.96 |
+-----------+------------+--------------------+----------------------
+------------+-------------+---------------+------------------
+-------+
(Output limit exceeded, 25 of 412 total rows shown)
```

You'll notice that the data is sorted in ascending order of BillingCity. That's why the data in the BillingCity column is sorted in alphabetical order. The data of the InvoiceDatecolumn is in turn sorted in descending order.

For example, if you review the records with the billing city of Amsterdam, the invoice dates are ordered in descending order from largest to smallest date. Similarly, if you examine the other sets of data closely, you'll observe the same.

The main types of ordering in SQL are ASC, ascending, and DESC, descending. How the data is ordered in these two cases would depend on the data type of the field or column being used as the sort column.