Veritabanı Yönetim Sistemleri

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SQL-2

❑ Relational Calculus

    ❑ Tuple Relational Calculus - TRC

    ❑ Domain Relational Calculus - DRC

❑SQL

    ❑ Select, Create, Update

    ❑ Delete

    ❑ Aggregate Functions(max, min, avg, count,)

SQL: Structured Query Language

ögrenci

ogrencino	isim	kullanıcıadı	yaş	ortalama
17532	Eymen	Eymen234	19	3.2
17347	Kemal	Kml45	17	3.7
17236	Cemil	Cm3418	18	2.9
16458	Hayri	Hayri95	19	3.8
17327	Mustafa	m.4417	18	5

```
CREATE TABLE ögrenci (
    ögrencino int primary key,
    isim varchar ,
    kullanıcıadı varchar ,
    yaş int,
    ortalama numeric
);
```

```
SELECT * from
ögrenci  WHERE
ortalama=  (select
min(ortalama) from
ögrenci) ;
```

```
UPDATE ögrenci
SET ortalama=ortalama+1
WHERE
ortalama =
  (select max(ortalama)
    from ögrenci) ;
```

- INSERT INTO
- SELECT * veya kolon(lar)
- DİSTİNCT
- ORDER
- DROP TABLE

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Mantıksal (logical) operatörler: AND, OR, and NOT

a	b	a AND b	a OR b
TRUE	TRUE	TRUE	TRUE
TRUE	FALSE	FALSE	TRUE
TRUE	NULL	NULL	TRUE
FALSE	FALSE	FALSE	FALSE
FALSE	NULL	FALSE	NULL
NULL	NULL	NULL	NULL

a	NOT a
TRUE	FALSE
FALSE	TRUE
NULL	NULL

Operator	Description
<	less than
>	greater than
<=	less than or equal to
>=	greater than or equal to
=	equal
<> or !=	not equal

Operator	Description	Example	Result
+	addition	2 + 3	5
−	subtraction	2 − 3	−1
*	multiplication	2 * 3	6
/	division (integer division truncates the result)	4 / 2	2
%	modulo (remainder)	5 % 4	1
^	exponentiation	2.0 ^ 3.0	8
|/	square root	|/ 25.0	5
||/	cube root	||/ 27.0	3
!	factorial	5 !	120
!!	factorial (prefix operator)	!! 5	120
@	absolute value	@ −5.0	5
&	bitwise AND	91 & 15	11
|	bitwise OR	32 | 3	35
#	bitwise XOR	17 # 5	20
~	bitwise NOT	~1	−2
<<	bitwise shift left	1 << 4	16
>>	bitwise shift right	8 >> 2	2

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```
CREATE TABLE fruits(
    id KISITLAMA  PRIMARY KEY,
    name VARCHAR NOT NULL
);
```

```
INSERT INTO fruits(name)
VALUES('orange');


INSERT INTO fruits(id,name)
VALUES(DEFAULT,'apple');
```

SMALLSERIAL	2 bytes	1 to 32,767
SERIAL	4 bytes	1 to 2,147,483,647
BIGSERIAL	8 bytes	1 to 922,337,2036,854,775,807

```
create table t2 (id serial primary key,name varchar(20),number integer);

    INSERT INTO t2(id,name,number) VALUES(DEFAULT,'ismail',95);
    INSERT INTO t2(id,name,number) VALUES(DEFAULT,'ali',95);
    INSERT INTO t2(id,name,number) VALUES(DEFAULT,'zeki',95);



            select * from t2;
```

?

SQL: create table and auto increment

```
create table t2 (id serial primary key,name varchar(20),number integer);

    INSERT INTO t2(id,name,number) VALUES(DEFAULT,'ismail',95);
    INSERT INTO t2(id,name,number) VALUES(DEFAULT,'ali',95);
    INSERT INTO t2(id,name,number) VALUES(DEFAULT,'zeki',95);
```

select * from t2;

	id integer	name character varying (20)	number integer
1	1	ismail	95
2	2	ali	95
3	3	zeki	95

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```
insert into t2(id,name,number) values(DEFAULT,'kamil',75);

select * from t2;
```

	id integer	name character varying (20)	number integer
1	1	ismail	95
2	2	ali	95
3	3	zeki	95
4	4	kamil	75

```
delete from t2 where name='ali';

select * from t2;
```

	id integer	name character varying (20)	number integer
1	1	ismail	95
2	2	ali	95
3	3	zeki	95
4	4	kamil	75

	id integer	name character varying (20)	number integer
1	1	ismail	95
2	3	zeki	95
3	4	kamil	75

SQL: insert and auto increment

```
INSERT INTO t2(id,name,number)
VALUES(DEFAULT,'murat',134);
```

select * from t2;

	id integer	name character varying (20)	number integer
1	1	ismail	95
2	3	zeki	95
3	4	kamil	75

	id integer	name character varying (20)	number integer
1	1	ismail	95
2	3	zeki	95
3	4	kamil	75
4	5	murat	134

Insert işlemi gerçekleştirildiğinde atomatik olarak üretilen id silinen degerleri kullanmaz.

SQL: create table and insert

```
psql -U kullaniciadi -d veritabani -a -f Books.sql
```

Books.sql — Edited

```
--
CREATE TABLE BooksList(
   ISBN varchar(13) NOT NULL default '',
   title varchar(255) default NULL,
   author varchar(255) default NULL,
   publicationyear int default NULL,
   publisher varchar(255) default NULL,
   ImageURLS varchar(255) default NULL,
   ImageURLM varchar(255)   default NULL,
   ImageURLL varchar(255) default NULL,
   PRIMARY KEY(ISBN));

--
-- Dumping data for table BooksList
--

INSERT INTO BooksList VALUES ('0195153448','Classical Mythology','Mark P. O. Morford',2002,'Oxford University Press','http://
images.amazon.com/images/P/0195153448.01.THUMBZZZ.jpg','http://images.amazon.com/images/P/0195153448.01.MZZZZZZZ.jpg','http://
images.amazon.com/images/P/0195153448.01.LZZZZZZZ.jpg');

INSERT INTO BooksList VALUES ('0002005018','Clara Callan','Richard Bruce Wright',2001,'HarperFlamingo Canada','http://images.amazon.com/
images/P/0002005018.01.THUMBZZZ.jpg','http://images.amazon.com/images/P/0002005018.01.MZZZZZZZ.jpg','http://images.amazon.com/images/P/
0002005018.01.LZZZZZZZ.jpg');

INSERT INTO BooksList VALUES ('0060973129','Decision in Normandy','Carlo DEste',1991,'HarperPerennial','http://images.amazon.com/images/P/
0060973129.01.THUMBZZZ.jpg','http://images.amazon.com/images/P/0060973129.01.MZZZZZZZ.jpg','http://images.amazon.com/images/P/
0060973129.01.LZZZZZZZ.jpg');
INSERT INTO BooksList VALUES ('0374157065','Flu: The Story of the Great Influenza Pandemic of 1918 and the Search for the Virus That Caused
It','Gina Bari Kolata',1999,'Farrar Straus Giroux','http://images.amazon.com/images/P/0374157065.01.THUMBZZZ.jpg','http://
images.amazon.com/images/P/0374157065.01.MZZZZZZZ.jpg','http://images.amazon.com/images/P/0374157065.01.LZZZZZZZ.jpg');
INSERT INTO BooksList VALUES ('0393045218','The Mummies of Urumchi','E. J. W. Barber',1999,'W. W. Norton &amp; Company','http://
images.amazon.com/images/P/0393045218.01.THUMBZZZ.jpg','http://images.amazon.com/images/P/0393045218.01.MZZZZZZZ.jpg','http://
images.amazon.com/images/P/0393045218.01.LZZZZZZZ.jpg');
INSERT INTO BooksList VALUES ('0399135782','The Kitchen Gods Wife','Amy Tan',1991,'Putnam Pub Group','http://images.amazon.com/images/P/
0399135782.01.THUMBZZZ.jpg','http://images.amazon.com/images/P/0399135782.01.MZZZZZZZ.jpg','http://images.amazon.com/images/P/
0399135782.01.LZZZZZZZ.jpg');
INSERT INTO BooksList VALUES ('0425176428','What If?: The Worlds Foremost Military Historians Imagine What Might Have Been','Robert
Cowley',2000,'Berkley Publishing Group','http://images.amazon.com/images/P/0425176428.01.THUMBZZZ.jpg','http://images.amazon.com/images/P/
0425176428.01.MZZZZZZZ.jpg','http://images.amazon.com/images/P/0425176428.01.LZZZZZZZ.jpg');
INSERT INTO BooksList VALUES ('0671870432','PLEADING GUILTY','Scott Turow',1993,'Audioworks','http://images.amazon.com/images/P/
0671870432.01.THUMBZZZ.jpg','http://images.amazon.com/images/P/0671870432.01.MZZZZZZZ.jpg','http://images.amazon.com/images/P/
0671870432.01.LZZZZZZZ.jpg');
INSERT INTO BooksList VALUES ('0679425608','Under the Black Flag: The Romance and the Reality of Life Among the Pirates','David Cordingly',
1996,'Random House','http://images.amazon.com/images/P/0679425608.01.THUMBZZZ.jpg','http://images.amazon.com/images/P/
0679425608.01.MZZZZZZZ.jpg','http://images.amazon.com/images/P/0679425608.01.LZZZZZZZ.jpg');
INSERT INTO BooksList VALUES ('074322678X','Where Youll Find Me: And Other Stories','Ann Beattie',2002,'Scribner','http://
images.amazon.com/images/P/074322678X.01.THUMBZZZ.jpg','http://images.amazon.com/images/P/074322678X.01.MZZZZZZZ.jpg','http://
images.amazon.com/images/P/074322678X.01.LZZZZZZZ.jpg');
```

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SQL: create table

ögrenci

ogrencino	isim	kullanıcıadı	yaş	ortalama
17532	Eymen	Eymen234	19	3.2
17347	Kemal	Kml45	17	3.7
17236	Cemil	Cm3418	18	2.9
16458	Hayri	Hayri95	19	3.8
17327	Mustafa	m.4417	18	5

alınandersler

ogrencino	derskodu	derskredi	dersnot

Birden fazla tabloyu kullanan sorgular oluşturmamız için **alınandersler** tablosunu oluşturalım

```
CREATE TABLE alınandersler (
    ogrencino integer references ogrenci(ogrencino),
    derskodu varchar ,
    derskredi integer,
    dersnot integer
);
```

alınandersler

ogrencino	derskodu	derskredi	dersnot

```
insert into alınandersler
values(17532,'BL44',4,85);
insert into alınandersler
values(17327,'MK25',3,73);
insert into alınandersler
values(17532,'BL13',3,94);
insert into alınandersler
values(17236,'T121',2,45);
insert into alınandersler
values(16458,'KM32',1,52);
insert into alınandersler
values(17236,'BL13',3,53);
insert into alınandersler
values(17347,'BL44',4,75);
insert into alınandersler
values(17532,'TR4',2,65);
```

alınandersler

ogrencino	derskodu	derskredi	dersnot
17532	BL44	4	85
17327	MK25	3	73
17532	BL13	3	94
17236	T121	2	45
16458	KM32	1	52
17236	BL13	3	53
17347	BL44	4	75
17532	TR4	2	65

SQL: Tablolar

ögrenci

ogrencino	isim	kullanıcıadı	yaş	ortalama
17532	Eymen	Eymen234	19	3.2
17347	Kemal	Kml45	17	3.7
17236	Cemil	Cm3418	18	2.9
16458	Hayri	Hayri95	19	3.8
17327	Mustafa	m.4417	18	5

alınandersler

ogrencino	derskodu	derskredi	dersnot
17532	BL44	4	85
17327	MK25	3	73
17532	BL13	3	94
17236	T121	2	45
16458	KM32	1	52
17236	BL13	3	53
17347	BL44	4	75
17532	TR4	2	65

ögrenci

ogrencino	isim	kullanıcıadı	yaş	ortalama
17532	Eymen	Eymen234	19	3.2
17347	Kemal	Kml45	17	3.7
17236	Cemil	Cm3418	18	2.9
16458	Hayri	Hayri95	19	3.8
17327	Mustafa	m.4417	18	5

alınandersler

ogrencino	derskodu	derskredi	dersnot
17532	BL44	4	85
17327	MK25	3	73
17532	BL13	3	94
17236	T121	2	45
16458	KM32	1	52
17236	BL13	3	53
17347	BL44	4	75
17532	TR4	2	65

```
SELECT  *  FROM alınandersler,
ögrenci where ögrenci.ogrencino
= alınandersler.ogrencino;
```

	ogrencino integer	ders.kodu character varying	ders.kredi integer	ders.not integer	ogrencino integer	isim character varying	kullanıcıadı character varying	yas integer	ortalama real
1	17532	BL44	4	85	17532	Eymen	Eymen234	19	3.2
2	17327	MK25	3	73	17327	Mustafa	m.4417	18	5
3	17532	BL13	3	94	17532	Eymen	Eymen234	19	3.2
4	17236	T121	2	45	17236	Cemil	Cm3418	18	2.9
5	16458	KM32	1	52	16458	Hayri	Hayri95	19	3.8
6	17236	BL13	3	53	17236	Cemil	Cm3418	18	2.9
7	17347	BL44	4	75	17347	Kemal	Kml45	17	3.7
8	17532	TR4	2	65	17532	Eymen	Eymen234	19	3.2

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SQL: Sorgulama (querying)

ögrenci

ogrencino	isim	kullanıcıadı	yaş	ortalama
17532	Eymen	Eymen234	19	3.2
17347	Kemal	Kml45	17	3.7
17236	Cemil	Cm3418	18	2.9
16458	Hayri	Hayri95	19	3.8
17327	Mustafa	m.4417	18	5

alınandersler

ogrencino	derskodu	derskredi	dersnot
17532	BL44	4	85
17327	MK25	3	73
17532	BL13	3	94
17236	T121	2	45
16458	KM32	1	52
17236	BL13	3	53
17347	BL44	4	75
17532	TR4	2	65

Eymen öğrencisinin almış olduğu bütün derslerin bilgilerini listeleyen sql sorgusunu yazınız.

```
SELECT * FROM
alınandersler d where
d.ogrencino =
(select ogrencino from
ögrenci o where
o.isim='Eymen') ;
```

	ogrencino integer	ders.kodu character varying	ders.kredi integer	ders.not integer
1	17532	BL44	4	85
2	17532	BL13	3	94
3	17532	TR4	2	65

ögrenci

ogrencino	isim	kullanıcıadı	yaş	ortalama
17532	Eymen	Eymen234	19	3.2
17347	Kemal	Kml45	17	3.7
17236	Cemil	Cm3418	18	2.9
16458	Hayri	Hayri95	19	3.8
17327	Mustafa	m.4417	18	5

alınandersler

ogrencino	derskodu	derskredi	dersnot
17532	BL44	4	85
17327	MK25	3	73
17532	BL13	3	94
17236	T121	2	45
16458	KM32	1	52
17236	BL13	3	53
17347	BL44	4	75
17532	TR4	2	65

Kemalin aldığı derslerden kredisi 4
den küçük olanları listeleyiniz

```
SELECT * FROM alınandersler d where
    d.ogrencino =
    (select ogrencino from ögrenci o
    where o.isim=Kemal')
    AND d.derskredi<4 ;
```

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❑ Like operatörü belirtilen **pattern (kalıp-desen)** e uyan sonuçları listeler.
❑ Like operatörü case sentitivedir.
❑ Ilike case-sensitive değildir.
❑ Desen içerisinde bulunan
  ❑ alt tire _ tek karakter anlamındadır
  ❑ yüzde % 0-n karakteri ifade etmektedir.

string **LIKE** *pattern*

string **NOT LIKE** *pattern*

string **ILIKE** *pattern*

SQL: Like Operatörü

- Like operatörü belirtilen **pattern (kalıp-desen)** e uyan sonuçları listeler.
- Like operatörü case sentitivedir.
- Ilike case-sensitive değildir.
- Desen içerisinde bulunan
  - alt tire _ tek karakter anlamındadır
  - yüzde % 0-n karakteri ifade etmektedir.

string **LIKE** *pattern*

```
~~   LIKE        !~~   NOT LIKE
```

string **NOT LIKE** *pattern*

```
~~* ILIKE        !~~* NOT ILIKE
```

string **ILIKE** *pattern*

alınandersler

ogrencino	derskodu	derskredi	dersnot
17532	BL44	4	85
17327	MK25	3	73
17532	BL13	3	94
17236	T121	2	45
16458	KM32	1	52
17236	BL13	3	53
17347	BL44	4	75
17532	TR4	2	65

```
SELECT * FROM alınandersler
where alınandersler.derskodu
LIKE '_ _ _ 4' ;
```

	ogrencino integer	ders.kodu character varying	ders.kredi integer	ders.not integer
1	17532	BL44	4	85
2	17347	BL44	4	75

alınandersler

ogrencino	derskodu	derskredi	dersnot
17532	BL44	4	85
17327	MK25	3	73
17532	BL13	3	94
17236	T121	2	45
16458	KM32	1	52
17236	BL13	3	53
17347	BL44	4	75
17532	TR4	2	65

```
SELECT * FROM
alınandersler  where
alınandersler.derskodu
LIKE 'BL%' ;
```

	ogrencino integer	ders.kodu character varying	ders.kredi integer	ders.not integer
1	17532	BL44	4	85
2	17532	BL13	3	94
3	17236	BL13	3	53
4	17347	BL44	4	75

SQL: As

ögrenci

ogrencino	isim	kullanıcıadı	yaş	ortalama
17532	Eymen	Eymen234	19	3.2
17347	Kemal	Kml45	17	3.7
17236	Cemil	Cm3418	18	2.9
16458	Hayri	Hayri95	19	3.8
17327	Mustafa	m.4417	18	5

As ifadesi geçici bir isim Tanımlamayı sağlar.

```
select
avg (ortalama)
AS
"sınıfortalaması"
from
ögrenci;
```

?

ögrenci

ogrencino	isim	kullanıcıadı	yaş	ortalama
17532	Eymen	Eymen234	19	3.2
17347	Kemal	Kml45	17	3.7
17236	Cemil	Cm3418	18	2.9
16458	Hayri	Hayri95	19	3.8
17327	Mustafa	m.4417	18	5

As ifadesi geçici bir isim Tanımlamayı sağlar.

```
select
avg (ortalama)
AS
"sınıfortalaması"
from
ögrenci;
```

sınıfortalaması double precision
1   3.7200002861023

```
SELECT sutunadı AS yeni_isim FROM table;
```

```
SELECT  *  FROM
   dersler d,  ögrenci o
where
   d.ogrencino = o.ogrencino;
```

AS
kullanılmayabilir
(optional)

alınandersler

ogrencino	derskodu	derskredi	dersnot
17532	BL44	4	85
17327	MK25	3	73
17532	BL13	3	94
17236	T121	2	45
16458	KM32	1	52
17236	BL13	3	53
17347	BL44	4	75
17532	TR4	2	65

```
SELECT * FROM
alınandersler
limit 4;
```

	ogrencino integer	ders.kodu character varying	ders.kredi integer	ders.not integer
1	17532	BL44	4	85
2	17327	MK25	3	73
3	17532	BL13	3	94
4	17236	T121	2	45

Limit tablonun ilk satırından itibaren n satırı listeler

SQL: Between (aralık belirleme)

ögrenci

ogrencino	isim	kullanıcıadı	yaş	ortalama
17532	Eymen	Eymen234	19	3.2
17347	Kemal	Kml45	17	3.7
17236	Cemil	Cm3418	18	2.9
16458	Hayri	Hayri95	19	3.8
17327	Mustafa	m.4417	18	5

Between komutu aralık belirlemede kullanılır
Belirtilen aralıkda eşit olan
değerleride alır
yaş >= 16 and yaş <= 18

```
select * from ögrenci
where yas
between 16 and 18;
```

	ogrencino integer	isim character varying	kullanıcıadı character varying	yas integer	ortalama real
1	17347	Kemal	Kml45	17	3.7
2	17236	Cemil	Cm3418	18	2.9
3	17327	Mustafa	m.4417	18	5

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SQL: IN

ögrenci

ogrencino	isim	kullanıcıadı	yaş	ortalama
17532	Eymen	Eymen234	19	3.2
17347	Kemal	Kml45	17	3.7
17236	Cemil	Cm3418	18	2.9
16458	Hayri	Hayri95	19	3.8
17327	Mustafa	m.4417	18	5

IN komutu verilen liste içinde arama yapar

```
Select * from ögrenci
where yas IN (18,19);
```

	ogrencino integer	isim character varying	kullanıcıadı character varying	yas integer	ortalama real
1	17532	Eymen	Eymen234	19	3.2
2	17236	Cemil	Cm3418	18	2.9
3	16458	Hayri	Hayri95	19	3.8
4	17327	Mustafa	m.4417	18	5

SQL: IN

ögrenci

ogrencino	isim	kullanıcıadı	yaş	ortalama
17532	Eymen	Eymen234	19	3.2
17347	Kemal	Kml45	17	3.7
17236	Cemil	Cm3418	18	2.9
16458	Hayri	Hayri95	19	3.8
17327	Mustafa	m.4417	18	5

IN komutunu kullanarak
Eymen ve Cemilin
bütün bilgilerini listeleyen SQL
sorgusunu yazınız

```
Select * from ögrenci
where isim
IN ('Eymen ', 'Cemil');
```

ögrenci

ogrencino	isim	kullanıcıadı	yaş	ortalama
17532	Eymen	Eymen234	19	3.2
17347	Kemal	Kml45	17	3.7
17236	Cemil	Cm3418	18	2.9
16458	Hayri	Hayri95	19	3.8
17327	Mustafa	m.4417	18	5

Fetch komutu belirtilen sıradan
başlamak kaydıyla
istelinen sayıda satırı
listelemeyi sağlar

```
SELECT ögrencino,isim
FROM ögrenci
ORDER BY isim
OFFSET 2 ROWS
FETCH FIRST 1 ROW ONLY;
```

SELECT kolon listesi **FROM** tablo ismi **WHERE** [şartlar]
GROUP BY kolonlar;

CustomerID	CustomerName	ContactName	Address	City	PostalCode	Country
1	Alfreds Futterkiste	Maria Anders	Obere Str. 57	Berlin	12209	Germany
2	Ana Trujillo Emparedados y helados	Ana Trujillo	Avda. de la Constitución 2222	México D.F.	05021	Mexico
3	Antonio Moreno Taquería	Antonio Moreno	Mataderos 2312	México D.F.	05023	Mexico
4	Around the Horn	Thomas Hardy	120 Hanover Sq.	London	WA1 1DP	UK
5	Berglunds snabbköp	Christina Berglund	Berguvsvägen 8	Luleå	S-958 22	Sweden

https://www.w3schools.com/sql/sql_groupby.asp

SQL: Group by

```
SELECT COUNT(CustomerID), Country FROM Customers
GROUP BY Country ORDER BY COUNT(CustomerID) DESC;
```

CustomerID	CustomerName	ContactName	Address	City	PostalCode	Country
1	Alfreds Futterkiste	Maria Anders	Obere Str. 57	Berlin	12209	Germany
2	Ana Trujillo Emparedados y helados	Ana Trujillo	Avda. de la Constitución 2222	México D.F.	05021	Mexico
3	Antonio Moreno Taquería	Antonio Moreno	Mataderos 2312	México D.F.	05023	Mexico
4	Around the Horn	Thomas Hardy	120 Hanover Sq.	London	WA1 1DP	UK
5	Berglunds snabbköp	Christina Berglund	Berguvsvägen 8	Luleå	S-958 22	Sweden

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```
SELECT COUNT(CustomerID), Country FROM Customers
GROUP BY Country ORDER BY COUNT(CustomerID) DESC;
```

COUNT(CustomerID)	Country
13	USA
11	France
11	Germany
9	Brazil
7	UK
5	Mexico
5	Spain
4	Venezuela
3	Argentina

```
SELECT COUNT(CustomerID), Country
   FROM Customers
     GROUP BY Country
       HAVING COUNT(CustomerID) > 5
         ORDER BY COUNT(CustomerID) DESC;
```

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