RDB&SQL Session -6 (Set Operators and Case)

SQL Session-6 (Set Operators & Case Expression)
Training Clarusway
Pear Deck - January 19, 2023 at 8:17PM

Part 1 - Summary

Use this space to summarize your thoughts on the lesson

Part 2 - Responses

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Use this space to take notes:

Slide 2


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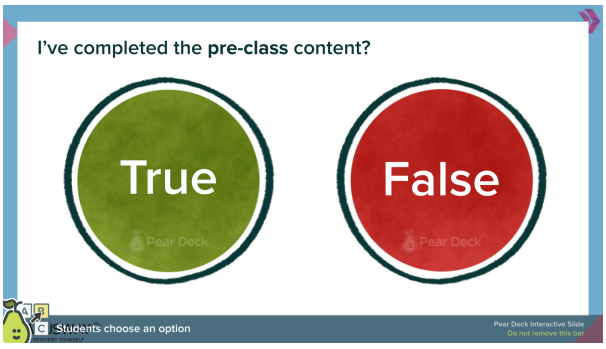
Slide 3	Your Response
	

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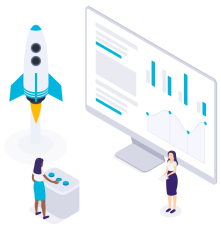
1 Introduction



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Introduction

- ★ Set operations allow the results of multiple queries to be combined into a single result set.
- ★ Set operators include UNION, UNION ALL, INTERSECT, and EXCEPT for MS SQL Server.

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Important!

- Both SELECT statements must contain the **same number of columns**.
- In the SELECT statements, the corresponding columns must have the **same data type**.
- Positional ordering must be used to sort the result set. The individual result set ordering is not allowed with Set operators. **ORDER BY can appear once at the end of the query.**
- **UNION and INTERSECT** operators are commutative, i.e. **the order of queries is not important**; it doesn't change the final result.
- **Performance-wise, UNION ALL** shows better performance as compared to **UNION** because resources are **not wasted in filtering duplicates and sorting** the result set.
- Set operators can be the **part of subqueries.**

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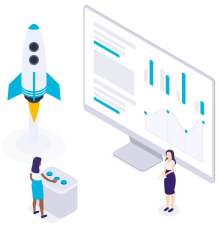
2 UNION



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Introduction

In some cases, you may need to **combine data from two or more tables** into a result set. **Union** clause is used to perform this operation.

The tables that you need to combine can be tables with similar data in the same database, or in different databases.

Syntax

```
SELECT column1, column2, ...
  FROM table_A
UNION
SELECT column1, column2, ...
  FROM table_B
```

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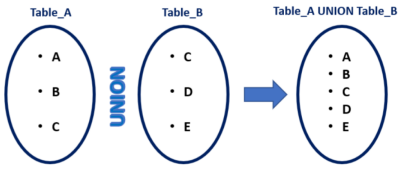
UNION



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Sample Tables

"employees_A" table:

emp_id	first_name	last_name	salary	job_title	gender
17679	Robert	Gilmore	110000	Operations Director	Male
26650	Elvis	Ritter	86000	Sales Manager	Male
30840	David	Barrow	85000	Data Scientist	Male
49714	Hugo	Forester	55000	IT Support Speciali	Male
51821	Linda	Foster	95000	Data Scientist	Female
67323	Lisa	Wiener	75000	Business Analyst	Female

"employees_B" table:

emp_id	first_name	last_name	salary	job_title	gender
49714	Hugo	Forester	55000	IT Support Specialist	Male
67323	Lisa	Wiener	75000	Business Analyst	Female
70950	Rodney	Weaver	87000	Project Manager	Male
71329	Gayle	Meyer	77000	HR Manager	Female
76589	Jason	Christian	99000	Project Manager	Male
97927	Billie	Lanning	67000	Web Developer	Female

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Example

query :

```
SELECT emp_id, first_name, last_name, job_title
  FROM employees_A
UNION
SELECT emp_id, first_name, last_name, job_title
  FROM employees_B;
```

output:

```
emp_id      first_name  last_name   job_title
----------  ----------  ----------  --------------------
17679       Robert      Gilmore     Operations Director
26650       Elvis       Ritter      Sales Manager
30840       David       Barrow      Data Scientist
49714       Hugo        Forester    IT Support Speciali
51821       Linda       Foster      Data Scientist
67323       Lisa        Wiener      Business Analyst
70950       Rodney      Weaver      Project Manager
71329       Gayle       Meyer       HR Manager
76589       Jason       Christian   Project Manager
97927       Billie      Lanning     Web Developer
```

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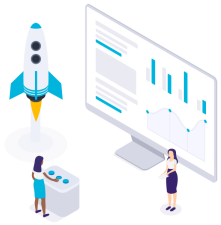
3 UNION ALL



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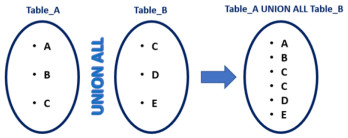
Introduction

Syntax

```
SELECT column1, column2, ...
  FROM table_A
UNION ALL
SELECT column1, column2, ...
  FROM table_B
```



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Sample Tables

"employees_A" table:

emp_id	first_name	last_name	salary	job_title	gender
17679	Robert	Gilmore	110000	Operations Director	Male
26650	Elvis	Ritter	86000	Sales Manager	Male
30840	David	Barrow	85000	Data Scientist	Male
49714	Hugo	Forester	55000	IT Support Speciali	Male
51821	Linda	Foster	95000	Data Scientist	Female
67323	Lisa	Wiener	75000	Business Analyst	Female

"employees_B" table:

emp_id	first_name	last_name	salary	job_title	gender
49714	Hugo	Forester	55000	IT Support Specialist	Male
67323	Lisa	Wiener	75000	Business Analyst	Female
70950	Rodney	Weaver	87000	Project Manager	Male
71329	Gayle	Meyer	77000	HR Manager	Female
76589	Jason	Christian	99000	Project Manager	Male
97927	Billie	Lanning	67000	Web Developer	Female

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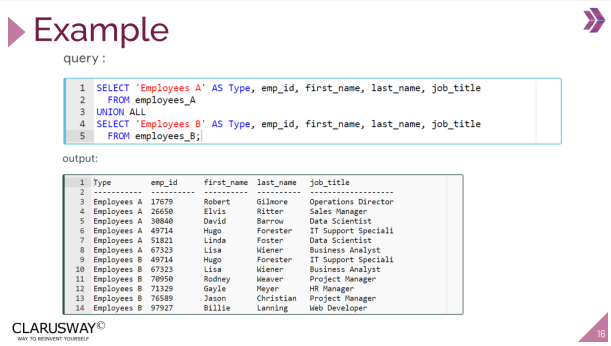

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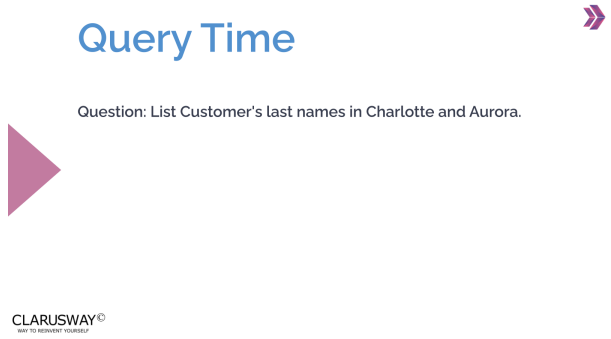

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Query Time For You

Question: Write a query that returns customers who first name is Thomas or last name is Thomas. (don't use 'OR')

Expected Output:

	first_name	last_name
1	Thomas	Rogers
2	Thomas	Chan
3	Thomas	Jefferson
4	Thomas	Moore
5	Thomas	Erickson
6	Thomas	Newman
7	Thomas	Mcdaniel
8	Thomas	Davis
9	Thomas	Webb
10	Thomas	Little
11	James	Thomas
12	Lidia	Thomas
13	Hildegar...	Thomas

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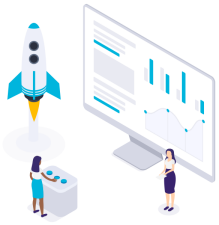
4 Intersect



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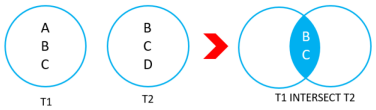
Introduction

INTERSECT operator compares the result sets of two queries and returns distinct rows that are output by both queries.



Syntax

```
SELECT column1, column2, ...
  FROM table_A
INTERSECT
SELECT column1, column2, ...
  FROM table_B
```

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Sample Tables

"employees_A" table:

emp_id	first_name	last_name	salary	job_title	gender
17679	Robert	Gilmore	110000	Operations Director	Male
26650	Elvis	Ritter	86000	Sales Manager	Male
30840	David	Barrow	85000	Data Scientist	Male
49714	Hugo	Forester	55000	IT Support Speciali	Male
51821	Linda	Foster	95000	Data Scientist	Female
67323	Lisa	Wiener	75000	Business Analyst	Female

"employees_B" table:

emp_id	first_name	last_name	salary	job_title	gender
49714	Hugo	Forester	55000	IT Support Specialist	Male
67323	Lisa	Wiener	75000	Business Analyst	Female
70950	Rodney	Weaver	87000	Project Manager	Male
71329	Gayle	Meyer	77000	HR Manager	Female
76589	Jason	Christian	99000	Project Manager	Male
97927	Billie	Lanning	67000	Web Developer	Female

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Example

query :

```
SELECT emp_id, first_name, last_name, job_title
  FROM employees_A
INTERSECT
SELECT emp_id, first_name, last_name, job_title
  FROM employees_B
  ORDER BY emp_id;
```

output:

```
emp_id      first_name  last_name   job_title
----------  ----------  ----------  --------------------
49714       Hugo        Forester    IT Support Specialist
67323       Lisa        Wiener      Business Analyst
```

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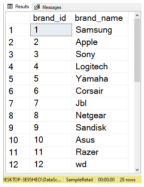
Query Time

Question: Write a query that returns brands that have products for both 2018 and 2019

Expected Output:



	brand_id	brand_name
1	1	Samsung
2	2	Apple
3	3	Sony
4	4	Logitech
5	5	Yamaha
6	6	Corsair
7	7	Jbl
8	8	Netgear
9	9	Sandisk
10	10	Asus
11	11	Razer
12	12	wd

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Query Time For You

Question: Write a query that returns customers who have orders for all of 2018, 2019, and 2020

Expected Output:

	first_name	last_name
1	Theresia	Schoeneck
2	Tomika	Bond
3	Daren	Rollins
4	Petronila	Higgins
5	Gilbert	Brown
6	Tajuana	Byers
7	Willow	Rulapaugh
8	Joshua	Mays
9	Joeann	Centini
10	Ronald	Gilliam
11	Jerald	Berray
12	Elizabeth	Levy

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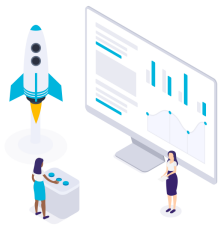
5 Except



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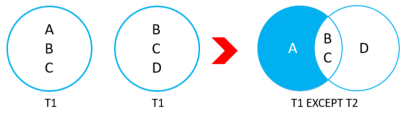
Introduction

EXCEPT operator compares the result sets of the two queries and returns the rows of the previous query that differ from the next query.



Syntax

```
SELECT column1, column2, ...
  FROM table_A
EXCEPT
SELECT column1, column2, ...
  FROM table_B
```

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Sample Tables

"employees_A" table:

emp_id	first_name	last_name	salary	job_title	gender
17679	Robert	Gilmore	110000	Operations Director	Male
26650	Elvis	Ritter	86000	Sales Manager	Male
30840	David	Barrow	85000	Data Scientist	Male
49714	Hugo	Forester	55000	IT Support Speciali	Male
51821	Linda	Foster	95000	Data Scientist	Female
67323	Lisa	Wiener	75000	Business Analyst	Female

"employees_B" table:

emp_id	first_name	last_name	salary	job_title	gender
49714	Hugo	Forester	55000	IT Support Specialist	Male
67323	Lisa	Wiener	75000	Business Analyst	Female
70950	Rodney	Weaver	87000	Project Manager	Male
71329	Gayle	Meyer	77000	HR Manager	Female
76589	Jason	Christian	99000	Project Manager	Male
97927	Billie	Lanning	67000	Web Developer	Female

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Example

query :

```
SELECT emp_id, first_name, last_name, job_title
  FROM employees_A
EXCEPT
SELECT emp_id, first_name, last_name, job_title
  FROM employees_B;
```

output:

```
emp_id      first_name  last_name   job_title
----------  ----------  ----------  --------------------
17679       Robert      Gilmore     Operations Director
26650       Elvis       Ritter      Sales Manager
30840       David       Barrow      Data Scientist
51821       Linda       Foster      Data Scientist
```

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Query Time

Question: Write a query that returns brands have a 2018 model product but not a 2019 model product.

Expected Output:

Results | Messages

	brand_id	brand_name
1	23	DENAQ
2	37	Western Digital

DESKTOP-3E9SHEO\DataSc... SampleRetail 00:00:00 2 rows

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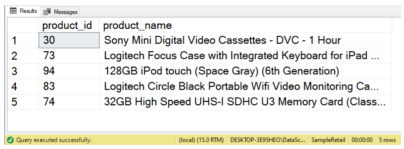
Query Time For You

Question: Write a query that returns only products ordered in 2019 (not ordered in other years).

Expected Output:



	product_id	product_name
1	30	Sony Mini Digital Video Cassettes - DVC - 1 Hour
2	73	Logitech Focus Case with Integrated Keyboard for iPad ...
3	94	128GB iPod touch (Space Gray) (6th Generation)
4	83	Logitech Circle Black Portable Wifi Video Monitoring Ca...
5	74	32GB High Speed UHS-I SDHC U3 Memory Card (Class...

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CASE Expression

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1 Introduction

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Introduction

The **CASE** expression evaluates a list of conditions and returns a value when the first condition is met.

The CASE expression is similar to the **IF-ELSE** statement in other programming languages.

There are two kinds of **CASE** expression:

- **Simple** CASE
- **Searched** CASE

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2 Simple CASE Expression

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Simple CASE Expression

Syntax

```
CASE case_expression
  WHEN when_expression_1 THEN result_expression_1
  WHEN when_expression_1 THEN result_expression_1
  ...
  [ ELSE else_result_expression ]
END
```


Use this space to take notes:

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Simple CASE Expression

department table

	id	name	dept_name	salary
1	10238	Eric	Economics	72000
2	13378	Karl	Music	42000
3	23493	Jason	Philosophy	49000
4	28299	Jane	Computer Science	91000
5	30766	Jack	Economics	68000
6	40284	Mary	Psychology	78000
7	43087	Brian	Physics	93000
8	53695	Richard	Philosophy	54000
9	58248	Joseph	Political Science	58000
10	63172	David	Art History	69000
11	64378	Elvis	Physics	87000
12	96945	John	Computer Science	80000
13	99231	Santosh	Computer Science	74000

query:

```
SELECT dept_name,
    CASE dept_name
        WHEN 'Computer Science' THEN 'IT'
        ELSE 'others'
    END AS category
FROM department;
```

output:

```
dept_name   category
----------  ----------
Economics   others
Music       others
Philosophy  others
Computer S  IT
Economics   others
Psychology  others
Physics     others
Philosophy  others
Political   others
Art Histor  others
Physics     others
Computer S  IT
Computer S  IT
```


Use this space to take notes:

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Query Time

Question: Generate a new column containing what the mean of the values in the Order_Status column.

1 = Pending; 2 = Processing; 3 = Rejected; 4 = Completed

Expected Output:

	order_id	order_status	order_status_desc
1	1	4	Completed
2	2	4	Completed
3	3	4	Completed
4	4	4	Completed
5	5	4	Completed
6	6	4	Completed
7	7	4	Completed
8	8	4	Completed
9	9	4	Completed
10	10	4	Completed

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Query Time For You

Question: Add a column to the sale.staff table containing the store names of the employees.

1 = Davi techno Retail; 2 = The BFLO Store; 3 = Burkes Outlet

Expected Output:

	first_name	last_name	store_id	Store_name
1	James	Garcia	1	Davi techno Retail
2	Charles	Cussona	1	Davi techno Retail
3	Jhon	Setamento	1	Davi techno Retail
4	Davis	Thomas	1	Davi techno Retail
5	Williams	Destrey	2	The BFLO Store
6	Barbara	Rodriguez	2	The BFLO Store
7	Taylor	Mango	2	The BFLO Store
8	Elizabeth	Island	3	Burkes Outlet
9	Brown	Jackson	3	Burkes Outlet

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Searched CASE Expression

Syntax

```
CASE
  WHEN condition_1 THEN result_1
  WHEN condition_2 THEN result_2
  WHEN condition_N THEN result_N
  [ ELSE result ]
END
```

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Searched CASE Expression

department table

	id	name	dept_name	salary
1	10238	Eric	Economics	72000
2	13378	Karl	Music	42000
3	23463	Jason	Philosophy	48000
4	28299	Jane	Computer Science	91000
5	30766	Jack	Economics	68000
6	40284	Mary	Psychology	78000
7	43087	Brian	Physics	93000
8	53695	Richard	Philosophy	54000
9	58248	Joseph	Political Science	58000
10	63172	David	Art History	65000
11	64378	Elvis	Physics	87000
12	96945	John	Computer Science	80000
13	99231	Santosh	Computer Science	74000

query:

```
SELECT first_name, last_name,
    CASE
        WHEN salary <= 55000 THEN 'Low'
        WHEN salary > 55000 AND salary < 80000 THEN 'Middle'
        WHEN salary >= 80000 THEN 'High'
    END AS category
FROM employees;
```

output:

```
first_name  last_name   category
----------  ----------  ----------
Robert      Gilmore     High
Elvis       Ritter      High
David       Barrow      High
Hugo        Forester    Low
Linda       Foster      High
Lisa        Wiener      Middle
Rodney      Weaver      High
Gayle       Meyer       Middle
Jason       Christian   High
Billie      Lanning     Middle
```


Use this space to take notes:

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Query Time

Question: Generate a new column containing what the mean of the values in the Order_Status column. **(use searched case ex.)**

1 = Pending; 2 = Processing; 3 = Rejected; 4 = Completed

Expected Output:

	order_id	order_status	order_status_desc
1	1	4	Completed
2	2	4	Completed
3	3	4	Completed
4	4	4	Completed
5	5	4	Completed
6	6	4	Completed
7	7	4	Completed
8	8	4	Completed
9	9	4	Completed
10	10	4	Completed

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Query Time For You

Question: Create a new column containing the labels of the customers' email service providers ("Gmail", "Hotmail", "Yahoo" or "Other")

Expected Output:

	first_name	last_name	email	email_service_provider
1	Diane	Flosi	DianeFlosi@msn.com	Other
2	Nana	Gaines	NanaGaines@msn.com	Other
3	Teddy	Mills	TeddyMills@hotmail.com	Hotmail
4	Nicolas	Garrison	NicolasGarrison@aliexpress.com	Other
5	Tessie	Mullen	TessieMullen@aol.com	Other
6	Cyril	Kohl	CyrilKohl@msn.com	Other
7	William	Williams	WilliamWilliams@gmail.com	Gmail
8	Elizabeth	Levy	ElizabethLevy@yahoo.com	Yahoo

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Query Time For You

Question: List customers who ordered products in the computer accessories, speakers, and mp4 player categories in the same order.

Expected Output:

	first_name	last_name
1	Barbara	Shealy
2	Gail	Pitts
3	Rima	Miller
4	Carita	Foreman
5	Charles	Ruta
6	Cira	Lane
7	Tamar	Schultz
8	Robert	Upthegr...
9	William	Jackson
10	Charles	Lawrence
11	Rosalie	Lapage
12	Ressie	Martinez

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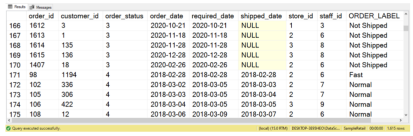
Query Time

Question: Create a new column that contains labels of the shipping speed of products.

1. If the product has **not been shipped yet**, it will be marked as **"Not Shipped"**.
2. If the product was shipped **on the day of order**, it will be labeled as **"Fast"**.
3. If the product is shipped **no later than two days after the order day**, it will be labeled as **"Normal"**
4. If the product was shipped **three or more days after the day of order**, it will be labeled as **"Slow"**.



	order_id	customer_id	order_status	order_date	required_date	shipped_date	store_id	staff_id	ORDER_LABEL
166	1612	3	3	2020-10-21	2020-10-21	NULL	1	3	Not Shipped
167	1613	1	3	2020-11-18	2020-11-18	NULL	2	6	Not Shipped
168	1614	135	3	2020-11-28	2020-11-28	NULL	3	8	Not Shipped
169	1615	136	3	2020-12-28	2020-12-28	NULL	3	8	Not Shipped
170	1407	18	3	2020-02-26	2020-02-26	NULL	2	6	Not Shipped
171	98	1194	4	2018-02-28	2018-02-28	2018-02-28	2	6	Fast
172	102	336	4	2018-03-02	2018-03-05	2018-03-03	2	7	Normal
173	105	306	4	2018-03-03	2018-03-05	2018-03-04	2	7	Normal
174	106	422	4	2018-03-04	2018-03-05	2018-03-05	3	9	Normal
175	108	12	4	2018-03-06	2018-03-09	2018-03-07	2	6	Normal

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Use this space to take notes:

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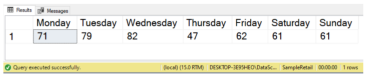
Query Time For You

Question: Write a query that returns the number distributions of the orders in the previous query result, according to the days of the week.

Expected Output:



	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
1	71	79	82	47	62	61	61

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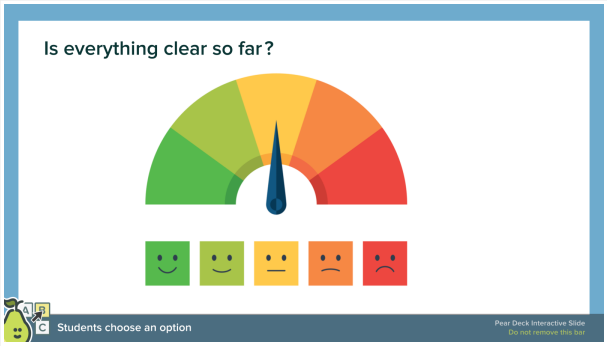
Use this space to take notes:

Slide 48	Your Response

Slide 48	Your Response
	

Use this space to take notes:

Slide 49


Use this space to take notes: