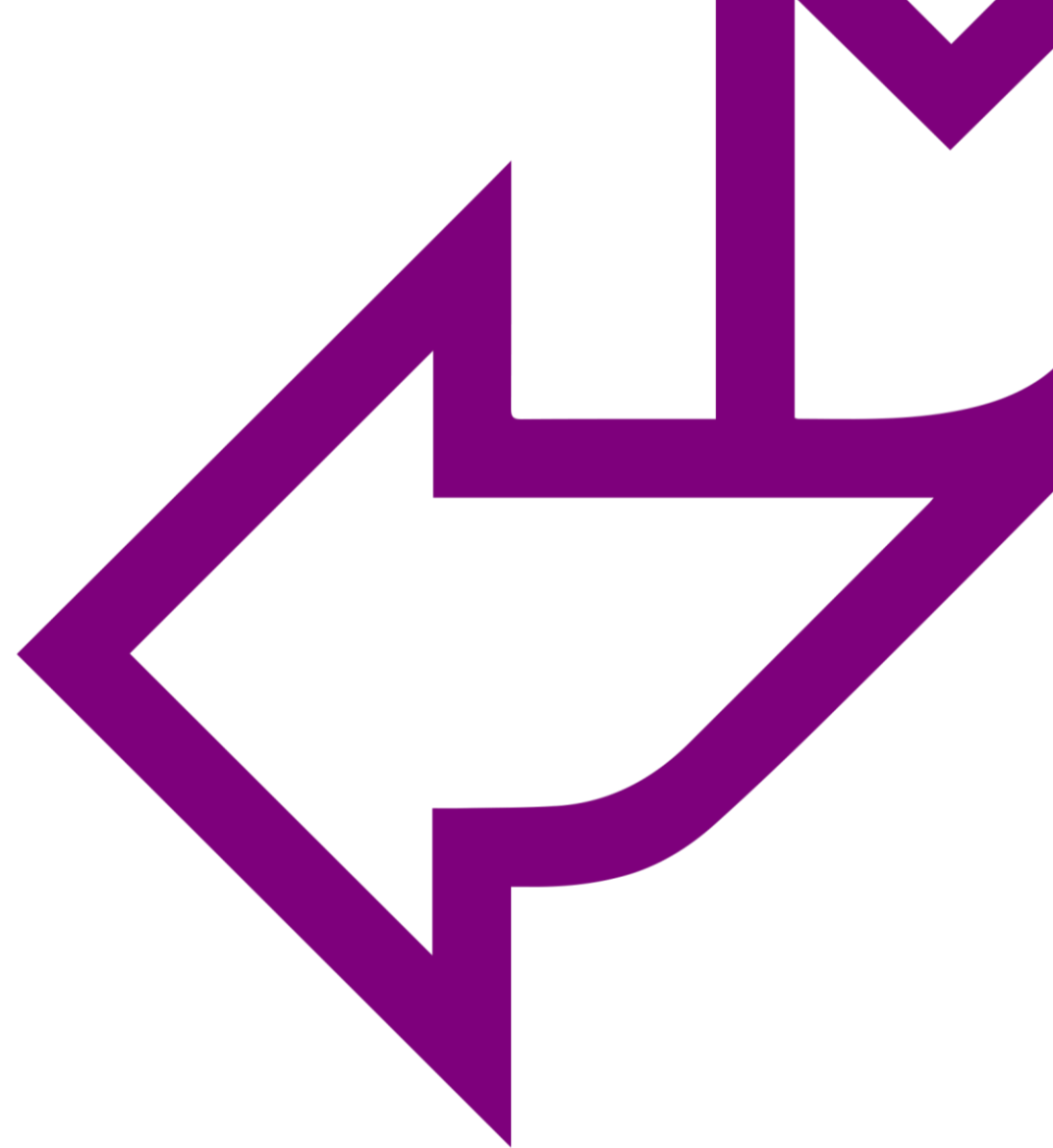




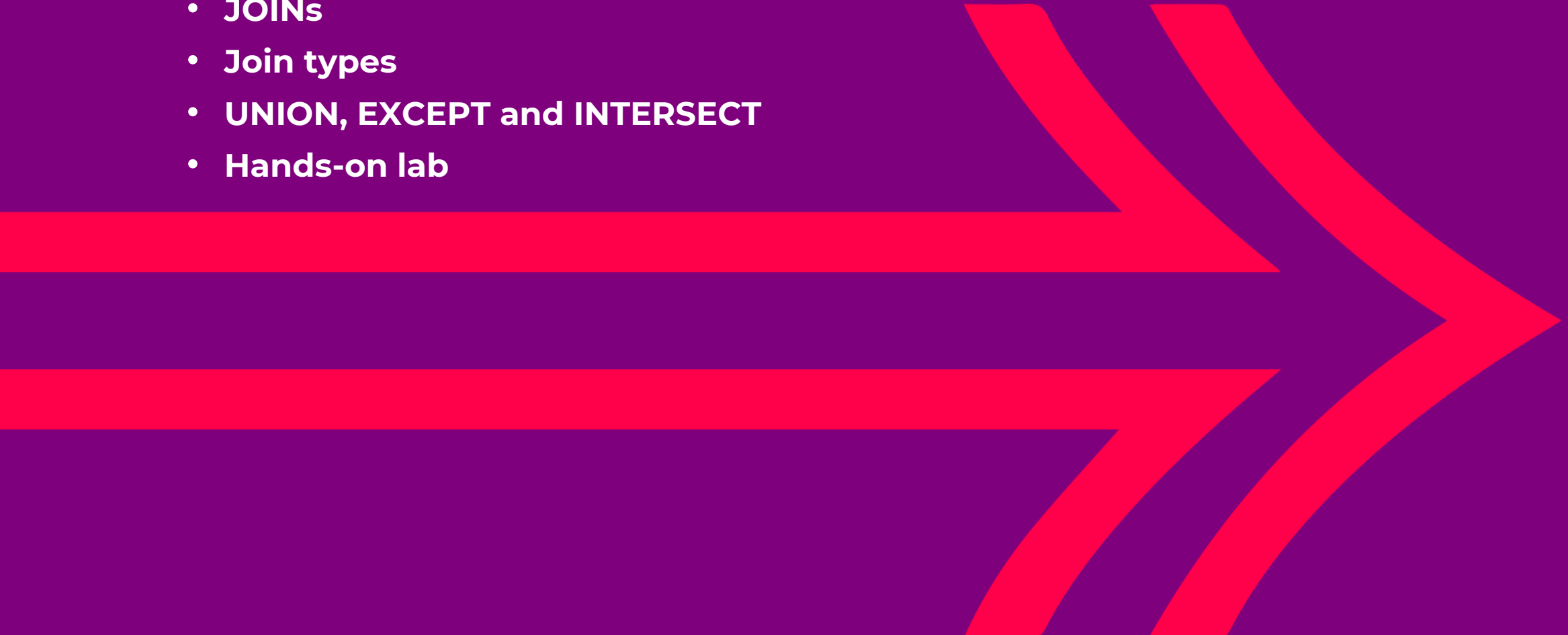
# Using Multiple Tables





# Overview

- JOINS
- Join types
- UNION, EXCEPT and INTERSECT
- Hands-on lab

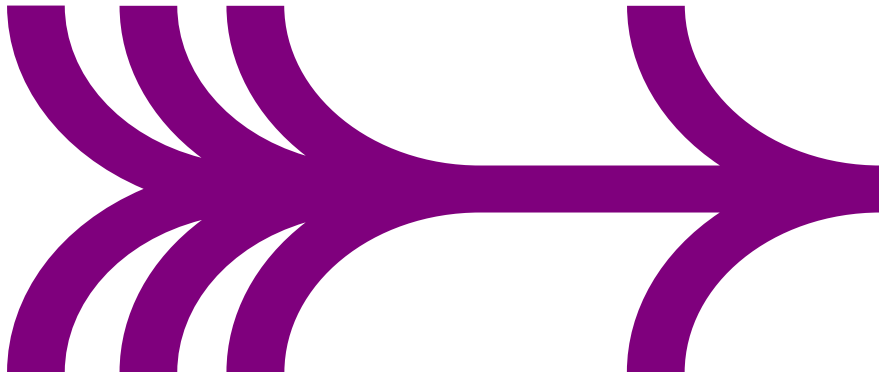




# OBJECTIVES

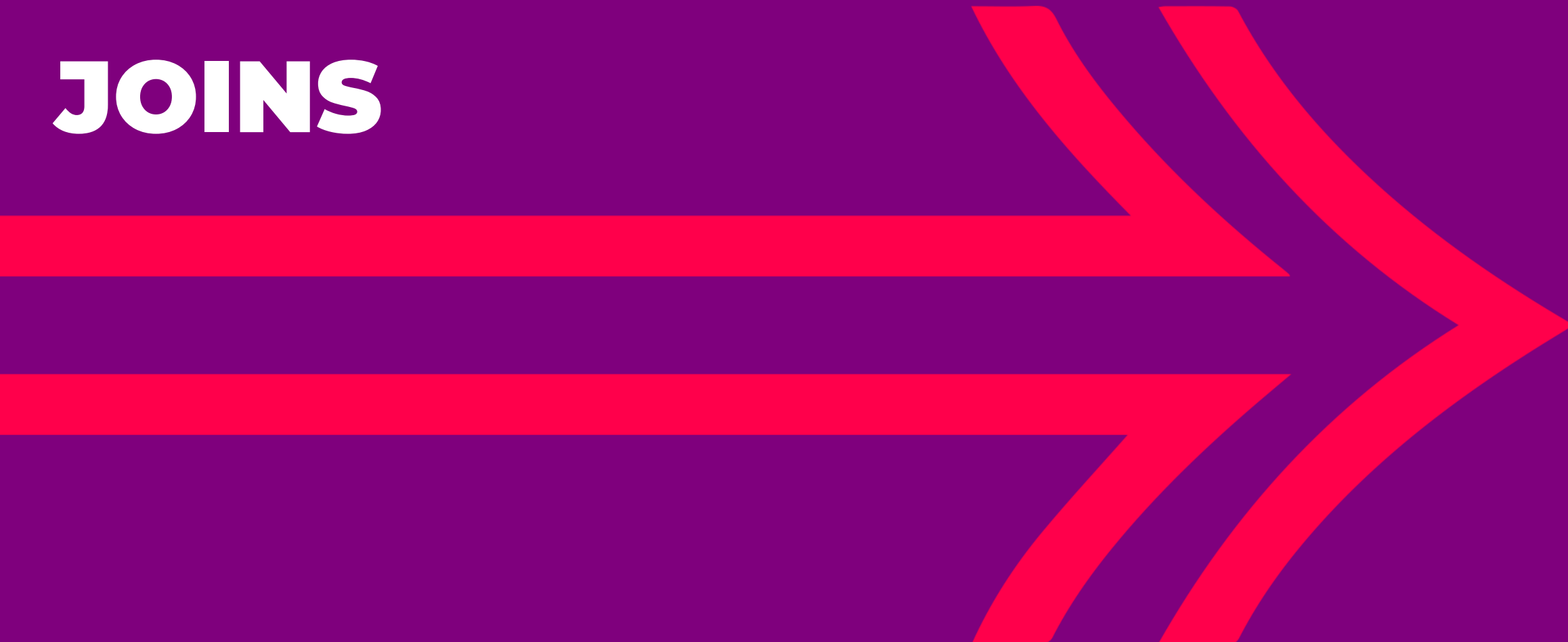
**At the end of this module you will be able to:**

- write a query that joins two tables together
- write a query that joins multiple tables
- write a query that uses an OUTER JOIN
- write a query that uses a UNION operator to join tables





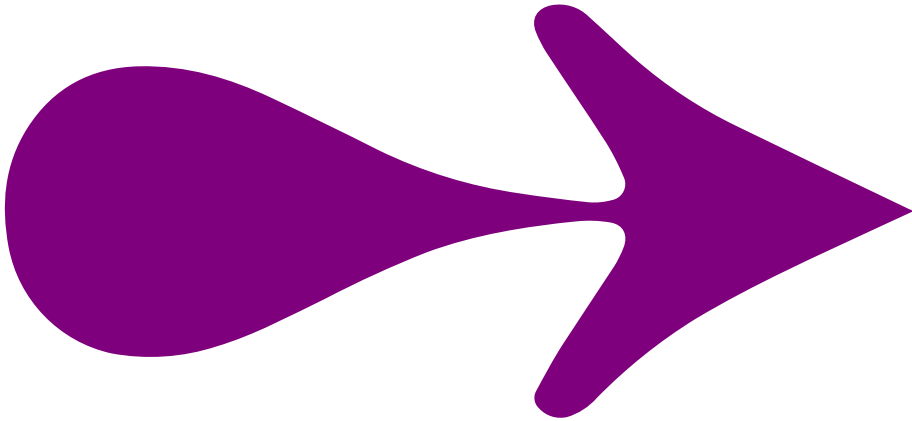
# JOINS





# JOINS

```
SELECT <<field(s)>>  
FROM <<table1>>  
type-of JOIN <<table2>> ON <<predicate>>  
WHERE <<condition(s)>>  
GROUP BY <<field(s)>>  
HAVING <<condition(s)>>  
ORDER BY <<field(s)>>
```





# Join types

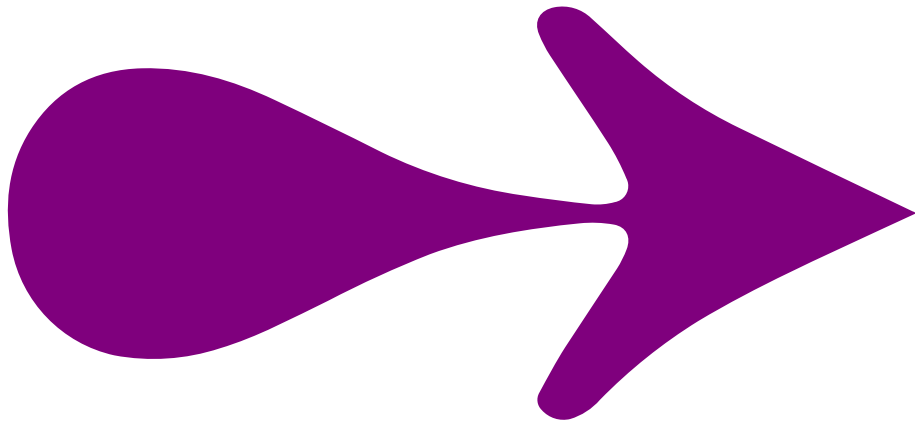




# Join types

## JOINS

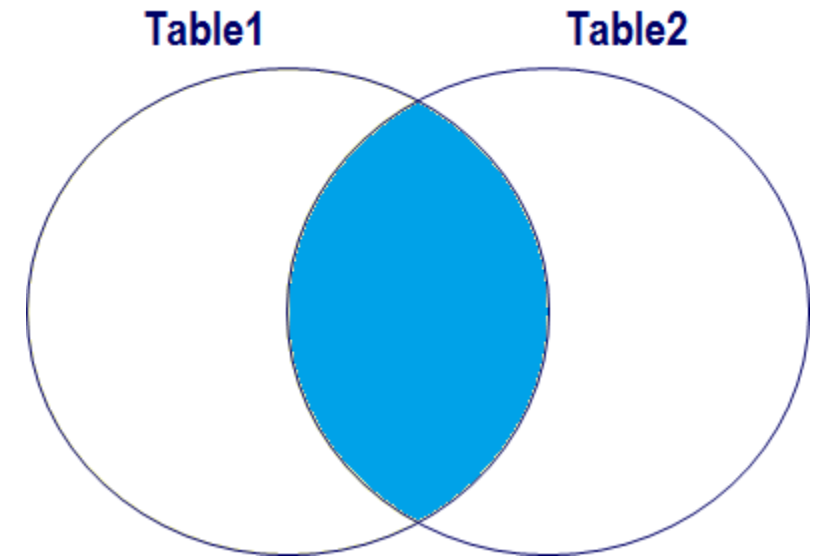
- Join
- (right, left, and full)





# Inner join

- Returns columns from both tables where the ON clause is true
- `SELECT *`
- `FROM Table1 INNER JOIN Table2`
- `ON Table1.Col1 = Table2.Col2`







# Inner join

```
SELECT
    Products.CategoryID,
    CategoryName,
    ProductID,
    ProductName
FROM
    dbo.Products
INNER JOIN
    dbo.Categories
ON
    Products.CategoryID =
    Categories.CategoryID
```

```
SELECT
    p.CategoryID,
    CategoryName,
    ProductID,
    ProductName
FROM
    dbo.Products AS p
JOIN
    dbo.Categories AS c
ON
    p.CategoryID =
    c.CategoryID
```

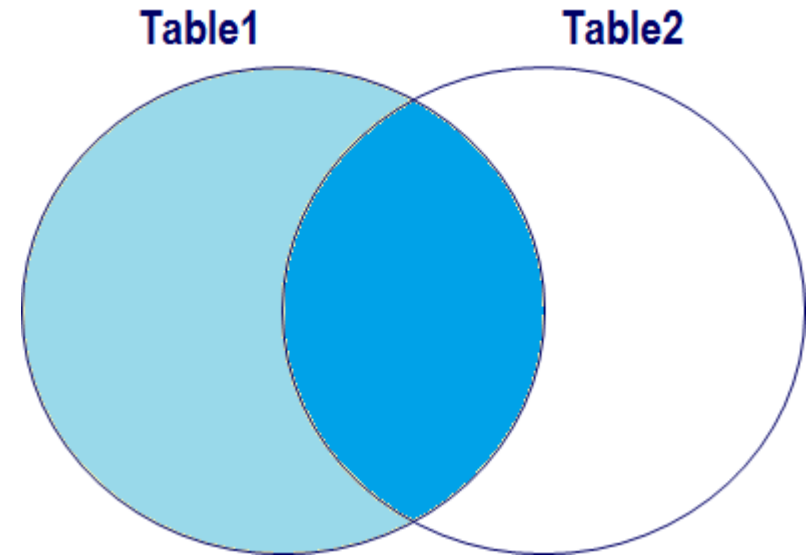
Results		Messages		
	CategoryID	CategoryName	ProductID	ProductName
1	1	Beverages	1	Chai
2	1	Beverages	2	Chang
3	2	Condiments	3	Aniseed Syrup

QATSQL\SQL2012 (11.0 CTP) | QATSQL\Student (53) | Northwind | 00:00:00 | 77 rows



# Left (outer) join

- Returns columns from both tables where the ON clause is true and columns from Table1 in all cases
- **SELECT \***
- **FROM Table1 LEFT JOIN Table2**
- **ON Table1.Col1 = Table2.Col2**





# Left join

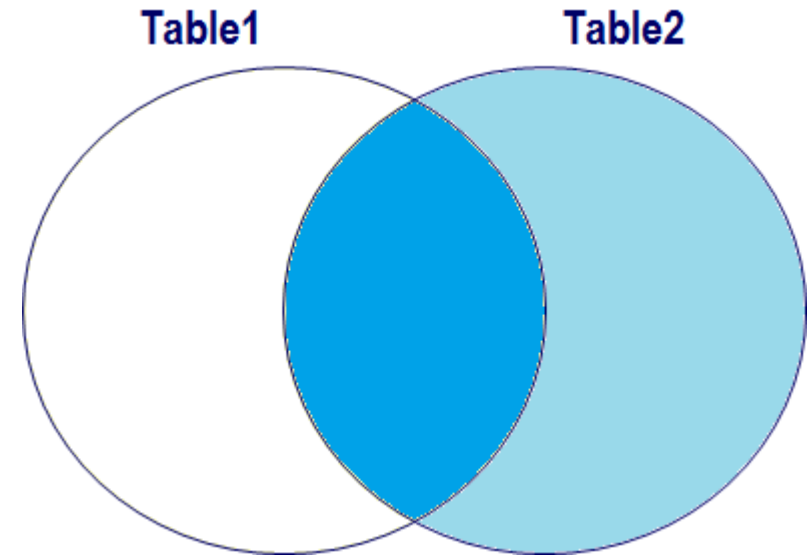
```
SELECT
    o.OrderID,
    o.OrderDate,
    c.CompanyName
FROM
    dbo.Customers AS c -- Left Table
LEFT JOIN
    dbo.Orders AS o
ON
    c.CustomerID =
        o.CustomerID
```

Results		Messages	
	OrderID	OrderDate	CompanyName
826	11073	1998-05-05 00:00:00.000	Pericles Comidas clásicas
827	11074	1998-05-06 00:00:00.000	Simons bistro
828	11075	1998-05-06 00:00:00.000	Richter Supermarkt
829	11076	1998-05-06 00:00:00.000	Bon app'
830	11077	1998-05-06 00:00:00.000	Rattlesnake Canyon Grocery
831	NULL	NULL	Paris spécialités
832	NULL	NULL	FISSA Fabrica Inter. Salchi...
(16.0 RTM)   northwind   00:00:00   832 rows			



# Right join

- Returns columns from both tables where the ON clause is true and columns from Table2 in all cases
- **SELECT \***
- **FROM Table1 RIGHT JOIN Table2**
- **ON Table1.Col1 = Table2.Col2**





# Right join

```
SELECT
    o.OrderID,
    o.OrderDate,
    c.CompanyName
FROM
    dbo.Customers AS c
RIGHT JOIN
    dbo.Orders AS o
ON
    c.CustomerID =
        o.CustomerID
```

Results		Messages	
	OrderID	OrderDate	CompanyName
1	10248	1996-07-04 00:00:00.000	Vins et alcools Chevalier
2	10249	1996-07-05 00:00:00.000	Toms Spezialitäten
3	10250	1996-07-08 00:00:00.000	Hanari Cames
4	10251	1996-07-08 00:00:00.000	Victuailles en stock
5	10252	1996-07-09 00:00:00.000	Suprêmes délices
6	10253	1996-07-10 00:00:00.000	Hanari Cames
7	10254	1996-07-11 00:00:00.000	Chop-suey Chinese
8	10255	1996-07-12 00:00:00.000	Richter Supermarkt
9	10256	1996-07-15 00:00:00.000	Wellington Importadora
(16.0 RTM)		northwind	00:00:00 830 rows



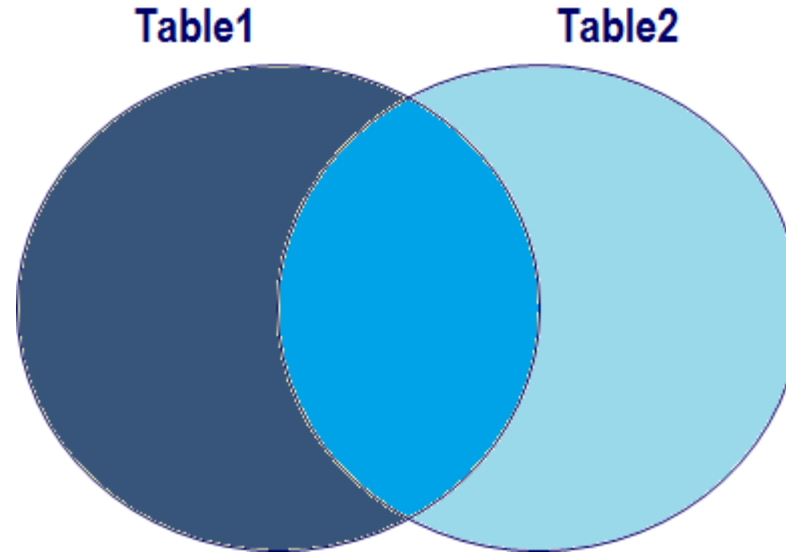
# Full join

- Returns columns from both tables where the ON clause is true and disjointed rows where matches are not found

**SELECT \***

**FROM Table1 FULL JOIN Table2**

**ON Table1.Col1 = Table2.Col2**





# Joining more than two tables

```
SELECT
o.OrderID, o.OrderDate,
c.CompanyName, e.FirstName, e.LastName
  FROM dbo.Customers AS c
LEFT JOIN dbo.Orders AS o
      ON c.CustomerID = o.CustomerID
LEFT JOIN dbo.Employees AS e ON e.EmployeeID =
o.EmployeeID
```

	OrderID	OrderDate	CompanyName	FirstName	LastName
509	10833	1998-01-15 00:00:00.000	Ottilies Käseleraden	Michael	Suyama
510	10999	1998-04-03 00:00:00.000	Ottilies Käseleraden	Michael	Suyama
511	11020	1998-04-14 00:00:00.000	Ottilies Käseleraden	Andrew	Fuller
512	NULL	NULL	Paris spécialités	NULL	NULL
513	10322	1996-10-04 00:00:00.000	Pericles Comidas clásicas	Robert	King
514	10354	1996-11-14 00:00:00.000	Pericles Comidas clásicas	Laura	Callahan
515	10474	1997-03-13 00:00:00.000	Pericles Comidas clásicas	Steven	Buchanan
516	10502	1997-04-10 00:00:00.000	Pericles Comidas clásicas	Andrew	Fuller

Query executed successfully (16.0 RTM) | northwind | 00:00:00 | 832 rows



# Joining a table to itself

```
SELECT
    emp.FirstName, emp.LastName,
    mgr.FirstName + ' ' + mgr.LastName
    AS BOSS
FROM
    dbo.Employees AS emp
JOIN
    dbo.Employees AS mgr
ON
    emp.ReportsTo =
        mgr.EmployeeID
```

Results			
Messages			
	First Name	Last Name	Boss
1	Nancy	Davolio	Andrew Fuller
2	Janet	Leverling	Andrew Fuller
3	Margaret	Peacock	Andrew Fuller
4	Steven	Buchanan	Andrew Fuller
5	Michael	Suyama	Steven Buchanan
6	Robert	King	Steven Buchanan
7	Laura	Callahan	Andrew Fuller
8	Anne	Dodsworth	Steven Buchanan

QATSQL\Student (57) | Northwind | 00:00:00 | 8 rows





# UNION, EXCEPT, and INTERSECT





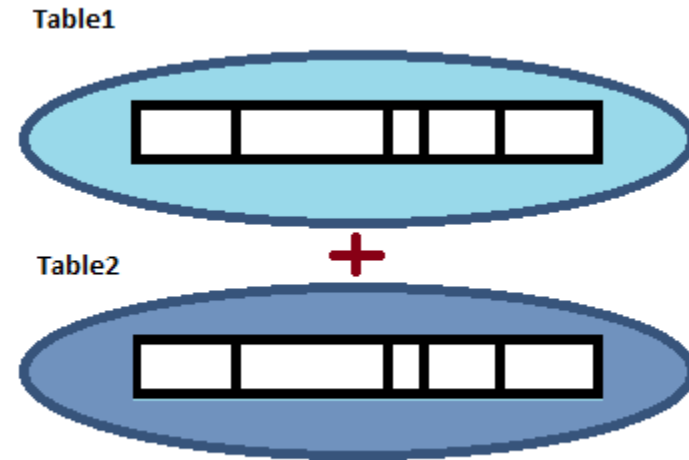
# Union [All]

- Accumulation of both sets
- Duplicates may occur with ALL

SELECT \* FROM Table1

**UNION**

SELECT \* FROM Table2





# Except

- Rows from Table1 where they do not exist in Table2

**SELECT \* FROM Table1**

**EXCEPT**

**SELECT \* FROM Table2**

Table1

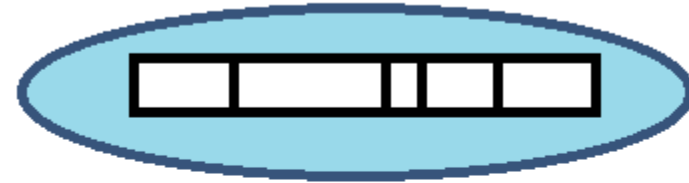


Table2





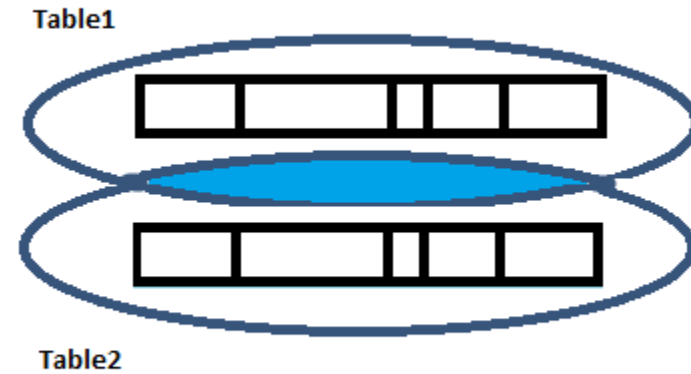
# Intersect

- Rows that exist in both sets will be returned

**SELECT \* FROM Table1**

**INTERSECT**

**SELECT \* FROM Table2**





## **Hands-on lab**

- **Inner joins**
- **Outer joins**
- **Unions**



# Review

- JOINS
- Join types
- UNION, EXCEPT, and INTERSECT

