School of Computer Science

Web and Database Computing 2019

Lecture 29: Combining Tables and Queries

adelaide.edu.au

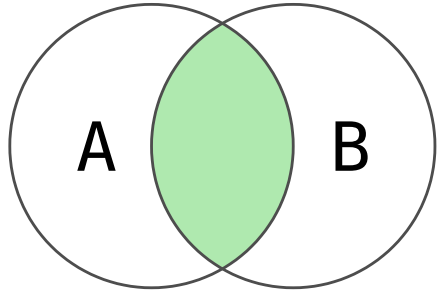
seek LIGHT

Doing more with Joins

Joins; Recap

- Joins combine tables, usually on a common column.
- The most common type of join is an **inner join** which only returns rows with matching values in a given column.

```
SELECT * FROM TableA INNER JOIN TableB
  ON TableA.column1 = TableB.column2;
```



- The ON clause is used to specify which columns should be matched
  - i.e. Any rows from `TableA` & `TableB` whose `column1` and `column2` values match will be combined into a single row in the result.

Other Joins: Cartesian

While an inner join may be the most common type of join that we use, there are other types of joins.

- A **Cartesian Join** is the simplest type of join.

```
SELECT * FROM tableA, tableB;
```

- Each row is combined with each column.

A

col1
a
b
c

B

col2
x
y
z

Result

col1	col2
a	x
a	y
a	z
b	x
b	y
b	z
c	x
c	y
c	z

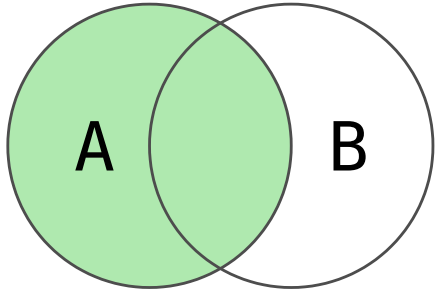
...

...

Other Joins; Left Outer Join

- The **Left Outer Join** joins two tables, keeping all rows of the first table.

```
SELECT * FROM TableA LEFT JOIN TableB
  ON TableA.column1 = TableB.column2;
```



- The ON clause is used to specify which columns should be matched
  - Rows from the first table that aren't matched will be padded out with NULL/default values.

TableA

column1
a
b
c

TableB

column2
a
y
c

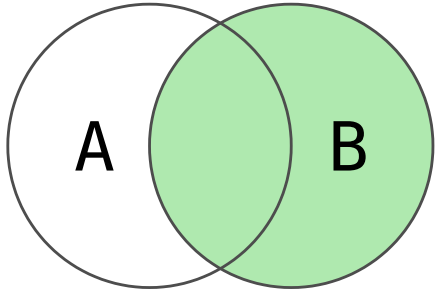
Result

column1	column2
a	a
b	NULL
c	c

Other Joins; Right Outer Join

- The **Right Outer Join** joins two tables, keeping all rows of the second table (reverse Left Outer Join)

```
SELECT * FROM TableA RIGHT JOIN TableB
  ON TableA.column1 = TableB.column2;
```



- The ON clause is used to specify which columns should be matched
  - Rows from the second table that aren't matched will be padded out with NULL/default values.
  - Some DBMS' do not support this because you could instead switch the order of the tables.

TableA

column1
a
b
c

TableB

column2
a
y
c

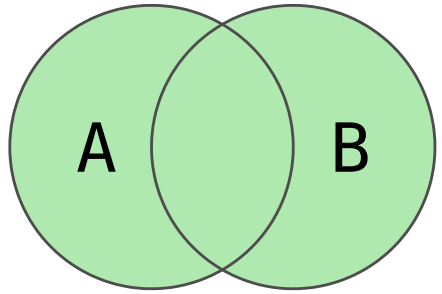
Result

column1	column2
a	a
NULL	y
c	c

Other Joins; Full Outer Join

- The **Full Outer Join** joins two tables, keeping all rows of the both tables

```
SELECT * FROM TableA FULL JOIN TableB
  ON TableA.column1 = TableB.column2;
```



- The ON clause is used to specify which columns should be matched
  - Rows from the either table that aren't matched will be padded out with NULL/default values.

TableA

column1
a
b
c

TableB

column2
a
y
c

Result

column1	column2
a	a
b	NULL
NULL	y
c	c

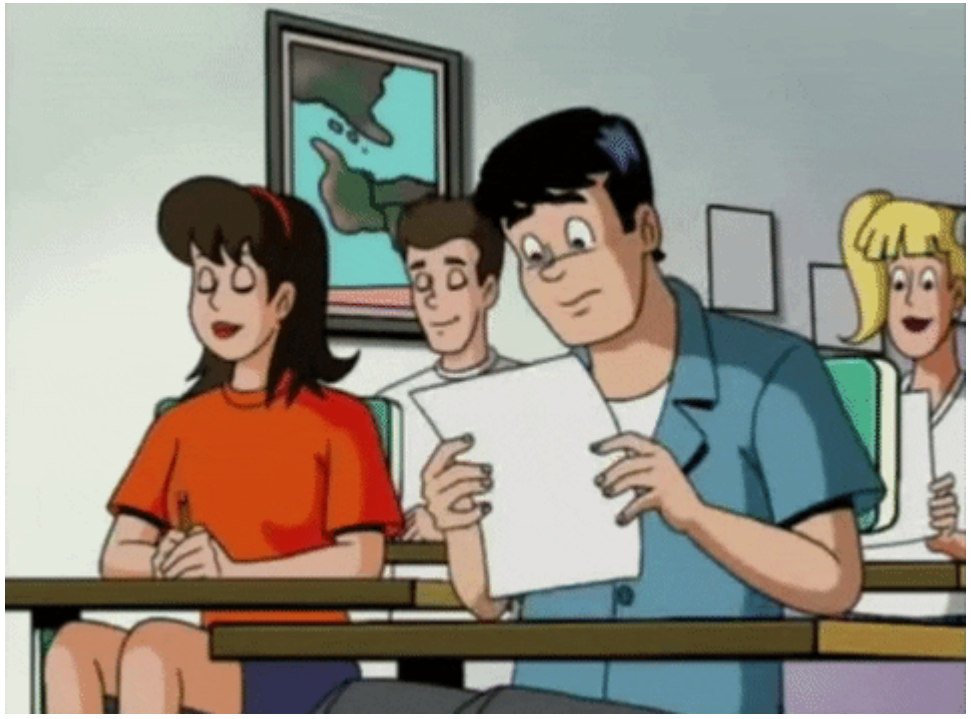
Other Joins; Natural Join

- A **Natural Join** is the same as an Inner Join, however the columns used to join are chosen automatically.

```
SELECT * FROM TableA NATURAL JOIN TableB;
```

- The column chosen will be one that has the exact same name and data type in both tables.

Quiz!



Refresher:

- 5 questions in the next 5 slides
  These do **not** appear in the PDF of the slideshow
- Answers in the online quiz visible after all 3 attempts
- 3 attempts at the quiz
- Keep highest mark
- Can be completed any time in the next 24h
- 0.5% of your final grade

< /quiz >

Combining Rows

Unions and Intersections

Sometimes we may want to combine the results of multiple queries into a single set of results.

- **Unions** append the results of one query to another:

```
SELECT * FROM TableA
UNION
SELECT * FROM TableB;
```

TableA

column1
a
b
c

TableB

column2
x
y

Result

column1
a
b
c
x
y

Unions

- Each SELECT statement within the Union must have the same number of fields in the result sets with similar data types.
- The column name in the result will be the name of the column from the first table.
- A standard union omits any duplicate rows.
  - To retain duplicate rows, use `UNION ALL`

Intersections

If we want only the rows that are returned from both queries, we can use an **Intersect**.

- **Intersections** return the matching results from two queries:

```
SELECT * FROM TableA
INTERSECT
SELECT * FROM TableB;
```

TableA

column1
a
b
c

TableB

column2
a
y
c

Result

column1
a
c

Modifying Column and Table Names

For use in queries and results

Aliases

Sometimes we may want to rename a column for outputting results, or make reading a query easier.

- This can be achieved using Aliases.
- Aliases use the AS keyword.

Aliases for columns

- We can alias columns like this:

```
SELECT column1 AS letters FROM TableA;
```

TableA

column1
a
b

Result

letters
a
b

Aliases

- We can alias tables like this:

```
SELECT column1 FROM TableA AS A;
```

- This is most useful for operations like joins:

```
SELECT A.column1,B.column2
FROM TableA AS A
INNER JOIN TableB AS B
ON A.column1 = B.column2
WHERE A.column1 = 'a';
```

Questions?


THE UNIVERSITY
of ADELAIDE

What's happening

Due:

- Prac Exercise 8 due Monday.
  - Websub Available now.

Next week:

- Views & Procedures
- Grouping & Filtering results
- Optimisation

Further learning:

- Keep working on your group projects