

MODULE 2 DATABASE PROGRAMMING

Intro to Ordering, Grouping, and database functions





YESTERDAY...

What is a **database**?

A database is made up of what?

Each column represents...

Each row represents....

How do we get data out of the database?

What if we want to filter the results?



SELECT to get data



ORDERING results

SYNTAX: ORDER BY col1 [ASC | DESC], col2 [ASC | DESC]

```
SELECT [code],[name],[lifeexpectancy] FROM [World].[dbo].[country] order by lifeexpectancy desc, name
```

```
SELECT [code],[name],[lifeexpectancy] FROM [World].[dbo].[country] where lifeexpectancy > 70  
order by lifeexpectancy desc, name
```



LIMITING results

SYNTAX: TOP *n*

```
SELECT TOP 5 [code],[name],[lifeexpectancy] FROM [Module_2].[dbo].[country] where  
lifeexpectancy > 70 order by lifeexpectancy desc, name
```



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AVGERAGE (AVG)

SYNTAX: AVG([column])

```
SELECT AVG(lifeexpectancy) AS 'Average Lifespan' FROM [Module_2].[dbo].[country]
```



SUM

SYNTAX: SUM([column])

```
SELECT sum(gnp) AS 'Gross National PProduct' FROM [Module_2].[dbo].[country]
```




COUNT

SYNTAX: COUNT([column])

```
select count(name) from country where lifeexpectancy > 60
```



MINIMUM AND MAXIMUM

SYNTAX: MIN([column])
 MAX([column])

select **max(lifeexpectancy)** as 'Max',**min(lifeexpectancy)** as 'Min' from country



AGGREGATE FUNCTIONS

- **AVG** returns the average value of a numeric column
- **SUM** returns the total sum of a numeric column
- **COUNT** returns the number of rows matching criteria
- **MIN** returns the smallest value of the selected column
- **MAX** returns the largest value of the selected column



GROUP BY

- **Group records into summary rows and return one record for each group**
- **Can be used when applying aggregate functions**

SYNTAX: SELECT expression1, expression2, ... expression_n, aggregate_function (aggregate_expression)
FROM tables [where condition_expression] **GROUP BY** expression1, expression2, ... expression_n ORDER
BY;



HAVING

- Kind of like where for aggregates

SYNTAX: SELECT column_name(s) FROM table_name WHERE condition GROUP BY column_name(s)
HAVING condition ORDER BY column_name(s);



CONCATENATING

Are you ready?



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SUBQUERIES

You can use queries *within* queries

```
select * from city where countrycode in (select code from country where headofstate='Beatrix')
```




SUBQUERIES

- Subqueries can only return **one column**
 - **select code from country where headofstate='Beatrix' <=** that's ok
 - **select code,name from country where headofstate='Beatrix' <=** that's not
- Most frequently used in **Where clauses** (and more on day 4)
- Can be used with the keyword **IN** or **NOT IN**



LET'S CODE!



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**WHAT QUESTIONS DO
YOU HAVE?**

