MODULE 2 DATABASE PROGRAMMING

Keys, JOIN, and UNION

YESTERDAY...

How do we specify the order of query results?

What's the syntax for only returning the first 8 records?

What is an aggregate function?

How do you get records into summary rows?

How do you use IN or NOT IN during the where clause?


amazon

Tables (maybe)

Users

Column Name	Data Type	Allow Nulls
id	int	☐
FirstName	varchar(50)	☐
LastName	varchar(50)	☐
MemberSince	datetime	☑
isActive	bit	☐
		☐

Purchases

Column Name	Data Type	Allow Nulls
id	int	☐
userID	int	☐
productID	int	☐
PurchaseDate	datetime	☐
isActive	bit	☐
		☐

Shipping_Addresses

Column Name	Data Type	Allow Nulls
id	int	☐
Street_1	varchar(50)	☐
Street_2	varchar(50)	☑
City	varchar(50)	☐
State	varchar(50)	☐
Zip	varchar(50)	☐
userID	int	☐
isActive	bit	☐
		☐

Products

Column Name	Data Type	Allow Nulls
id	int	☐
Description	varchar(MAX)	☐
Price	float	☐
Location	int	☐
isActive	bit	☐
		☐

Users

Column Name	Data Type	Allow Nulls
id	int	☐
FirstName	varchar(50)	☐
LastName	varchar(50)	☐
MemberSince	datetime	☑
isActive	bit	☐
		☐

Shipping_Addresses

Column Name	Data Type	Allow Nulls
id	int	☐
Street_1	varchar(50)	☐
Street_2	varchar(50)	☑
City	varchar(50)	☐
State	varchar(50)	☐
Zip	varchar(50)	☐
userID	int	☐
isActive	bit	☐
		☐

Purchases

Column Name	Data Type	Allow Nulls
id	int	☐
userID	int	☐
productID	int	☐
PurchaseDate	datetime	☐
isActive	bit	☐
		☐

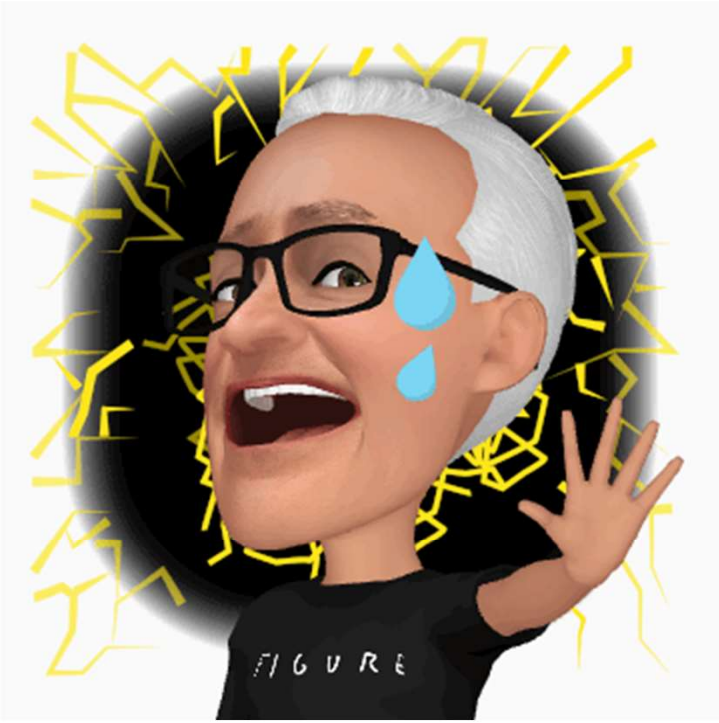
Products

Column Name	Data Type	Allow Nulls
id	int	☐
Description	varchar(MAX)	☐
Price	float	☐
Location	int	☐
isActive	bit	☐
		☐

select * from Shipping_Addresses where userID in (select id from Users where FirstName='Henry' and LastName='Edwards')

select * from Purchases where userID in (select id from Users where FirstName='Henry' and LastName='Edwards')

select * from Products where id in (select productID from Purchases where userID in (select id from Users where FirstName='Henry' and LastName='Edwards'))



FIGURE

KEYS

Users

Column Name	Data Type	Allow Nulls
id	int	☐
FirstName	varchar(50)	☐
LastName	varchar(50)	☐
MemberSince	datetime	☑
isActive	bit	☐
		☐

Shipping_Addresses

Column Name	Data Type	Allow Nulls
id	int	☐
Street_1	varchar(50)	☐
Street_2	varchar(50)	☑
City	varchar(50)	☐
State	varchar(50)	☐
Zip	varchar(50)	☐
userID	int	☐
isActive	bit	☐
		☐

Primary key columns are columns that hold a value that is unique for every row in that table.

Foreign key is a field in one table that uniquely identifies a row of another table

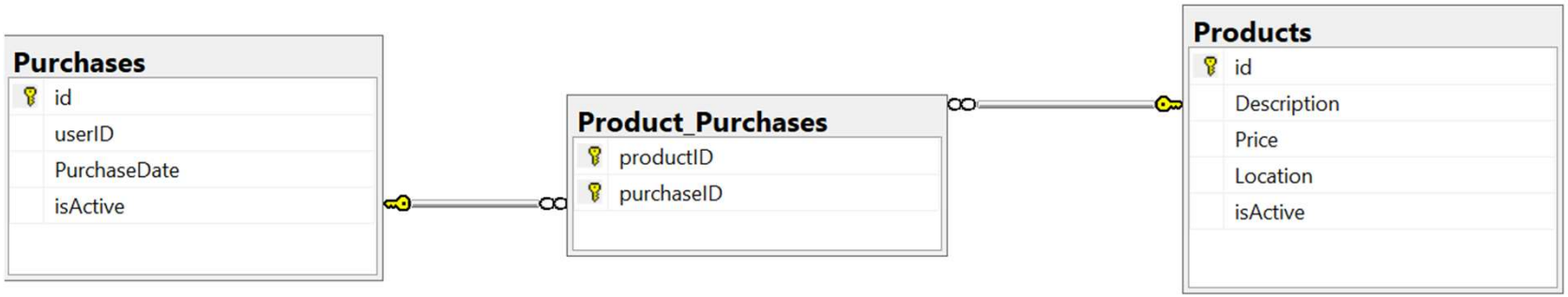
ELEVATE YOURSELF

CARDINALITY

ONE TO MANY

CARDINALITY

CARDINALITY



MANY TO MANY

JOINS

- **SQL JOIN**s allow us to create queries that produce data from one or more tables.

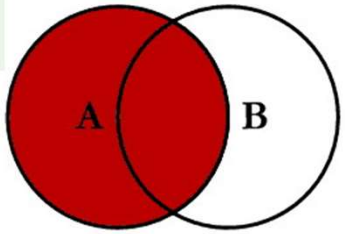
	code	name	continent	region	surfacearea	indepyear	population	lifeexpectancy	gnp	gnpold	localname	governmentform	headofstate	capital	code2
1	ABW	Aruba	North America	Caribbean	193	NULL	103000	78.4	828.00	793.00	Aruba	Nonmetropolitan Territory of The Netherlands	Beatrix	129	AW
2	AFG	Afghanistan	Asia	Souther...	652090	1919	22720000	45.9	5976	NULL	Afganist...	Islamic Emirate	Mohamm...	1	AF
3	AFG	Afghanistan	Asia	Souther...	652090	1919	22720000	45.9	5976	NULL	Afganist...	Islamic Emirate	Mohamm...	1	AF
4	AFG	Afghanistan	Asia	Souther...	652090	1919	22720000	45.9	5976	NULL	Afganist...	Islamic Emirate	Mohamm...	1	AF
5	AFG	Afghanistan	Asia	Souther...	652090	1919	22720000	45.9	5976	NULL	Afganist...	Islamic Emirate	Mohamm...	1	AF
6	AGO	Angola	Africa	Central ...	1246700	1975	12878000	38.3	6648	7984	Angola	Republic	Jos? Edu...	56	AO
7	AGO	Angola	Africa	Central ...	1246700	1975	12878000	38.3	6648	7984	Angola	Republic	Jos? Edu...	56	AO
8	AGO	Angola	Africa	Central ...	1246700	1975	12878000	38.3	6648	7984	Angola	Republic	Jos? Edu...	56	AO

select * from country order by code

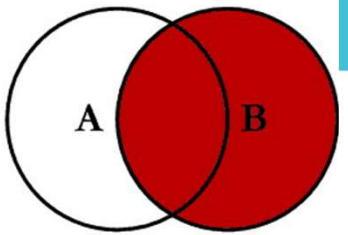
	id	name	countrycode	district	population
1	129	Oranjestad	ABW	?	29034
2	1	Kabul	AFG	Kabol	1780000
3	2	Qandahar	AFG	Qan...	237500
4	3	Herat	AFG	Herat	186800
5	4	Mazar-e-...	AFG	Balkh	127800
6	56	Luanda	AGO	Lua	2022000
7	57	Huambo	AGO	Hua	163100
8	58	Lobito	AGO	Ben...	130000

select * from city order by countrycode

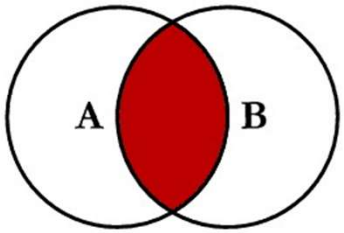
SQL JOINS



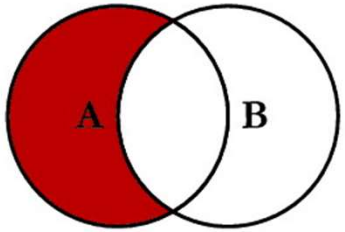

```
SELECT <select_list>
FROM TableA A
LEFT JOIN TableB B
ON A.Key = B.Key
```



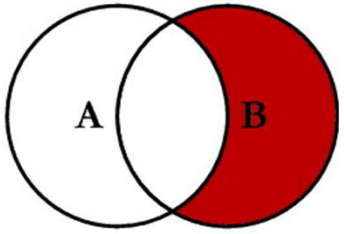

```
SELECT <select_list>
FROM TableA A
RIGHT JOIN TableB B
ON A.Key = B.Key
```



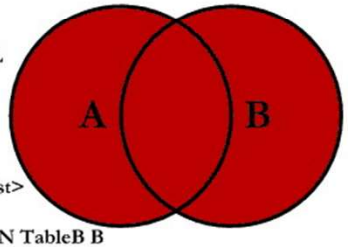

```
SELECT <select_list>
FROM TableA A
INNER JOIN TableB B
ON A.Key = B.Key
```



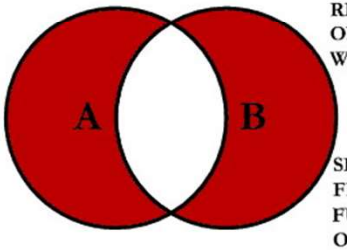

```
SELECT <select_list>
FROM TableA A
LEFT JOIN TableB B
ON A.Key = B.Key
WHERE B.Key IS NULL
```




```
SELECT <select_list>
FROM TableA A
RIGHT JOIN TableB B
ON A.Key = B.Key
WHERE A.Key IS NULL
```




```
SELECT <select_list>
FROM TableA A
FULL OUTER JOIN TableB B
ON A.Key = B.Key
```




```
SELECT <select_list>
FROM TableA A
FULL OUTER JOIN TableB B
ON A.Key = B.Key
WHERE A.Key IS NULL
OR B.Key IS NULL
```

UNIONS

- A SQL UNION combines the results of two or more queries into a single result set.
- The number of columns involved **must match exactly** and data types must be identical.
- Duplicate rows are removed.

SYNTAX:

```
SELECT expression1, expression2, ... expression_n FROM tables [WHERE conditions]
UNION
SELECT expression1, expression2, ... expression_n FROM tables [WHERE conditions]
```

LET'S CODE!

WHAT QUESTIONS DO YOU HAVE?