

Introduction to SQL

Chris Alldredge
Trainer/Consultant

PowerSchool University 2011



Objectives

After completing this course, you will be able to:

- Become the database whisperer in your district
- Understand what it might mean when your friends choose “It’s Complicated” for their relationship status on Facebook
- Give the “birds and the bees” talk about joining database tables

Meet the Trainer

Christopher Alldredge

Program Manager, Strategic Initiatives



- **Bachelor of Science**
Elementary Education
Southern Utah University



- **Master of Arts**
Educational Counseling
University of Phoenix

- **Customer Education**
Pearson
Joined in 2000



- **PowerSchool University**
Instructed at EVERY PSU



- **eCloud Learning**
Visit my blog -
www.ecloudlearning.com

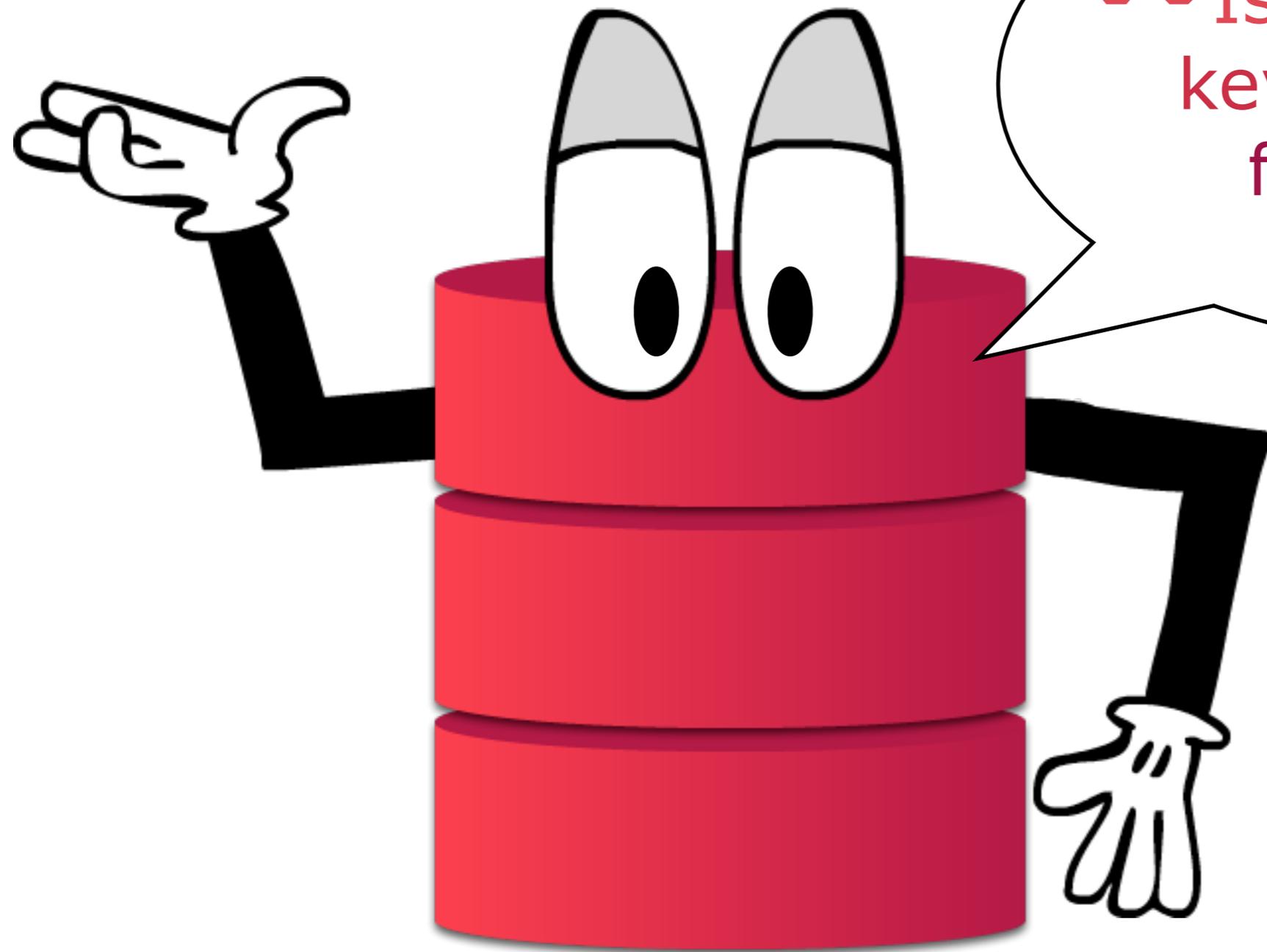


The Alldredge Family

What is SQL?

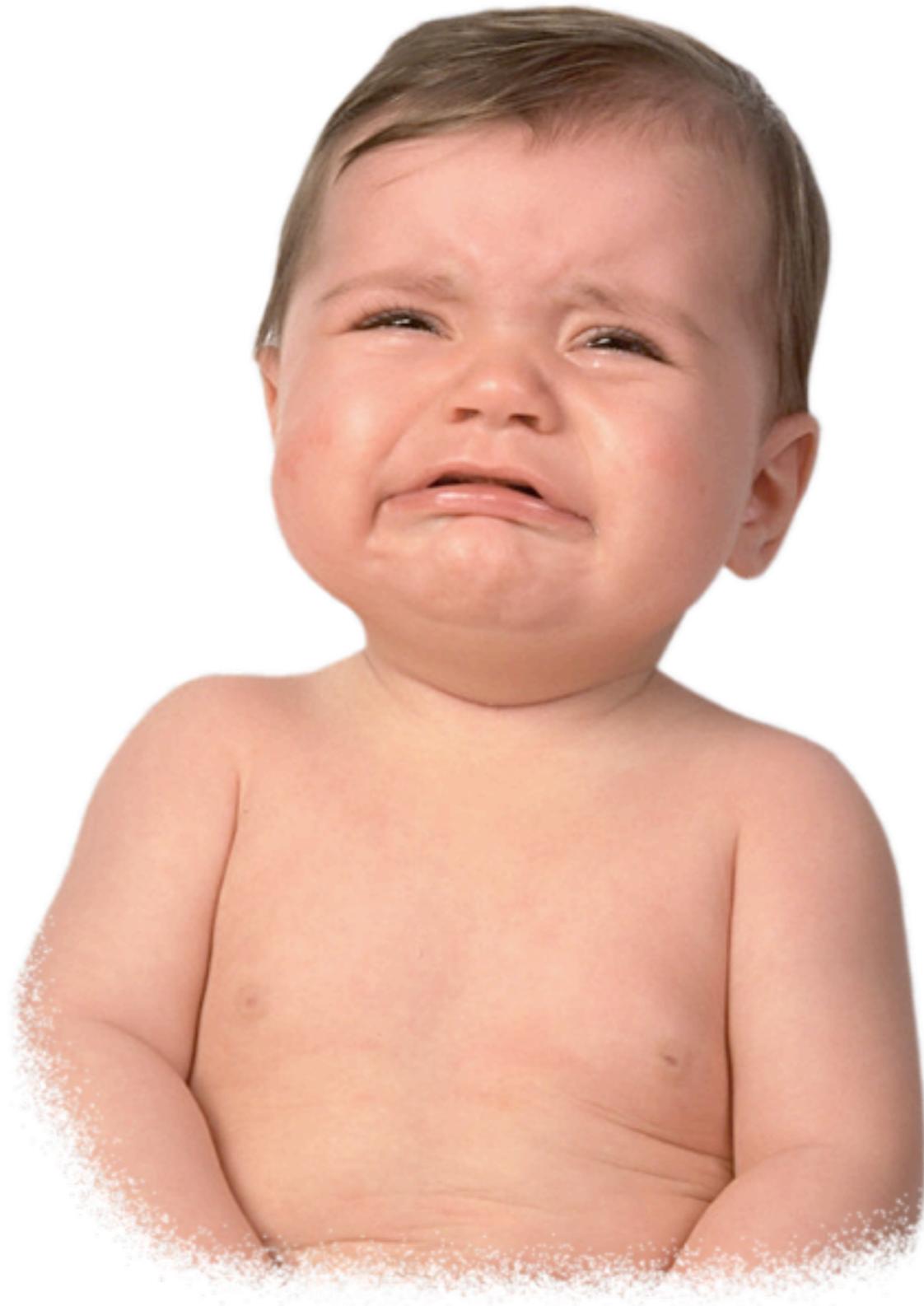
1

What is SQL?



“ Is the primary key equal to the foreign key? ”

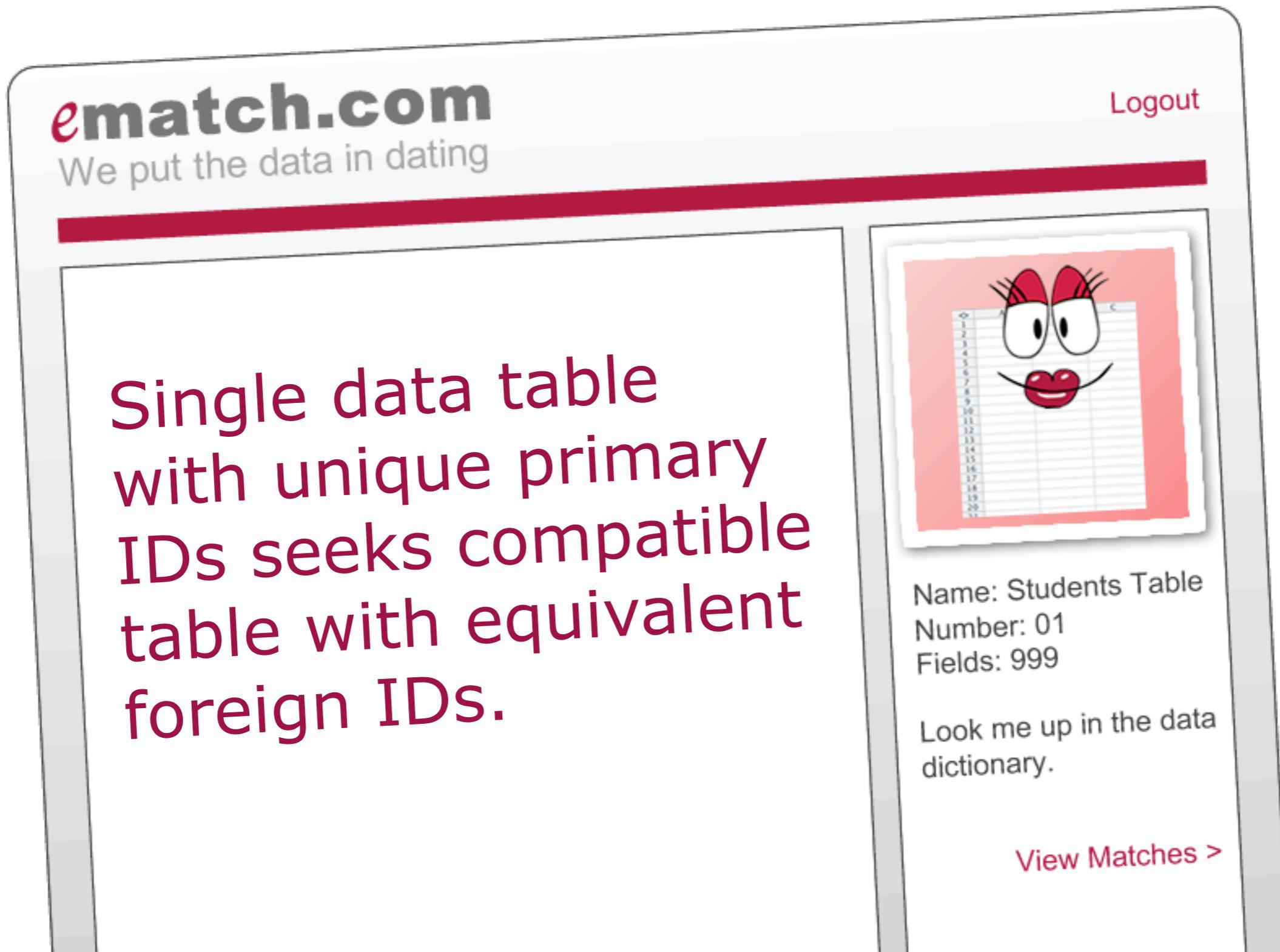
How did you learn your first language?



What is a Relational Database?



What is a Relational Database?



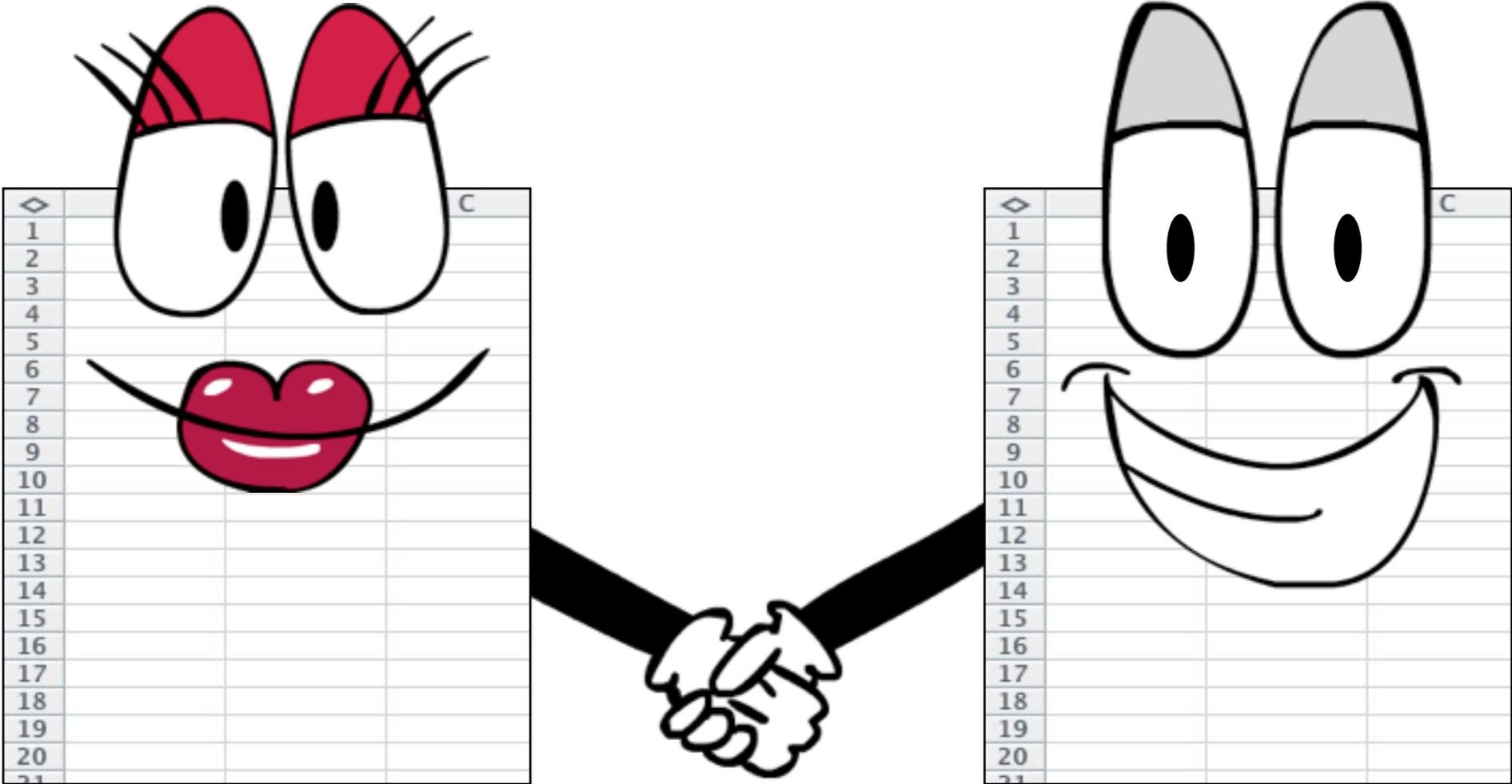
A table is similar to a spreadsheet...

A table is similar to a spreadsheet...

ID	Last_Name	First_Name	Grade_Level	Gender	DOB	SchoolID
104	Adams	Drew	10	M	9/15/1996	100
105	Anderson	Michael	11	M	2/17/1995	100
106	Andrews	Sam	10	M	12/3/1995	100
107	Brady	Suzy	11	F	4/15/1995	100
108	Bowen	Brook	11	F	1/5/1995	100
109	Clements	Jason	12	M	3/2/1994	100
110	Cox	Chelsea	12	F	7/24/1994	100
111	DeMonja	Rocky	10	M	11/29/1995	100
112	Dunn	Amy	9	F	7/30/1997	100

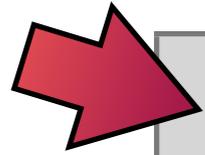
Data

Relationships between tables...



Relationships between tables...

Students



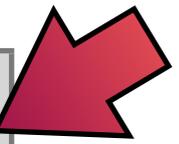
ID	Last_Name	First_Name	Grade_Level	Gender	DOB	SchoolID
104	Adams	Drew	10	M	9/15/1996	100
105	Anderson	Michael	11	M	2/17/1995	100
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Primary Key

Relationships between tables...

StoredGrades

ID	Course_Name	Course_Number	Grade	StoreCode	Absences	StudentID
5161	French 1	FL140	B+	S1	2	108
5162	Health	HE100	A	S1	2	108
5163	Phys Ed	PE450	A	S1	3	108
5164	Biology	SCI400	C+	S1	2	108
5165	Drama 1	PA145	A	S1	2	108
5166	Pottery	FA220	B-	S1	2	108
5167	Art 3	FA120	A	S1	2	108
5168	Geometry	MAT300	B	S1	2	108
5169	English 10	ENG200	C	S1	5	108



Foreign Key

Relationships between tables...

Students

ID	Last_Name	First_Name	Grade
104	Adams	Drew	10
105	Anderson	Michael	10
106	Andrews	Sam	10
107	Brady	Suzy	10
108	Bowling	Brook	10
109	Clements	Jason	10
110	Cox	Chelsea	10
111	DeMonja	Rocky	10
112	Dunn	Amy	10

StoredGrades

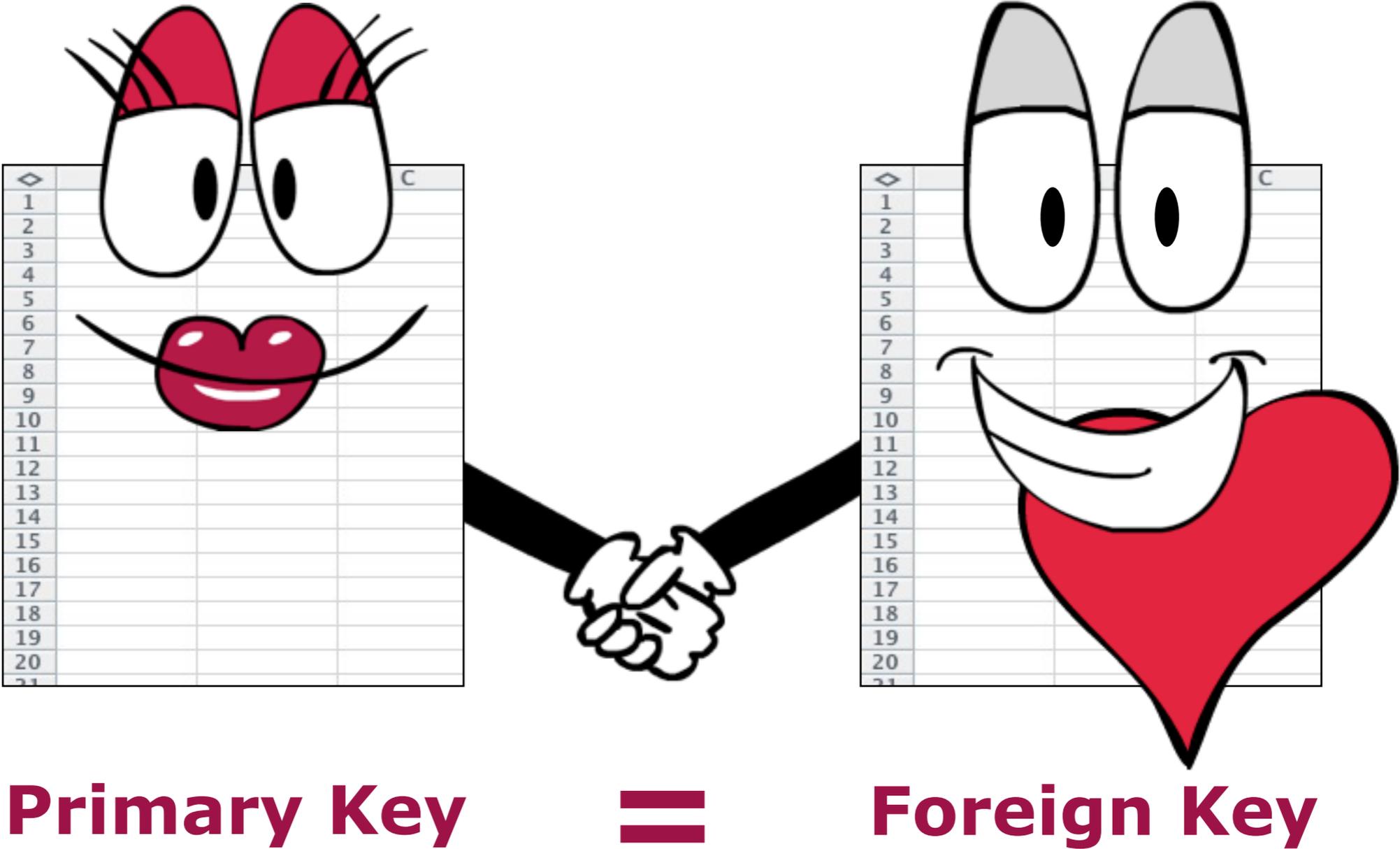
Grade	Course_Name	Grade	StudentID
10	French 1	B+	108
10	Health	A	108
10	Phys Ed	A	108
10	Biology	C+	108
10	Drama 1	A	108
10	Pottery	B-	108
10	Art 3	A	108
10	Geometry	B	108
10	English 10	C	108

Primary Key

=

Foreign Key

Relationships between tables...



Now It's Your Turn



Complete hands-on activity 1:

Examining Tables and Diagrams

Table Relationship Diagrams

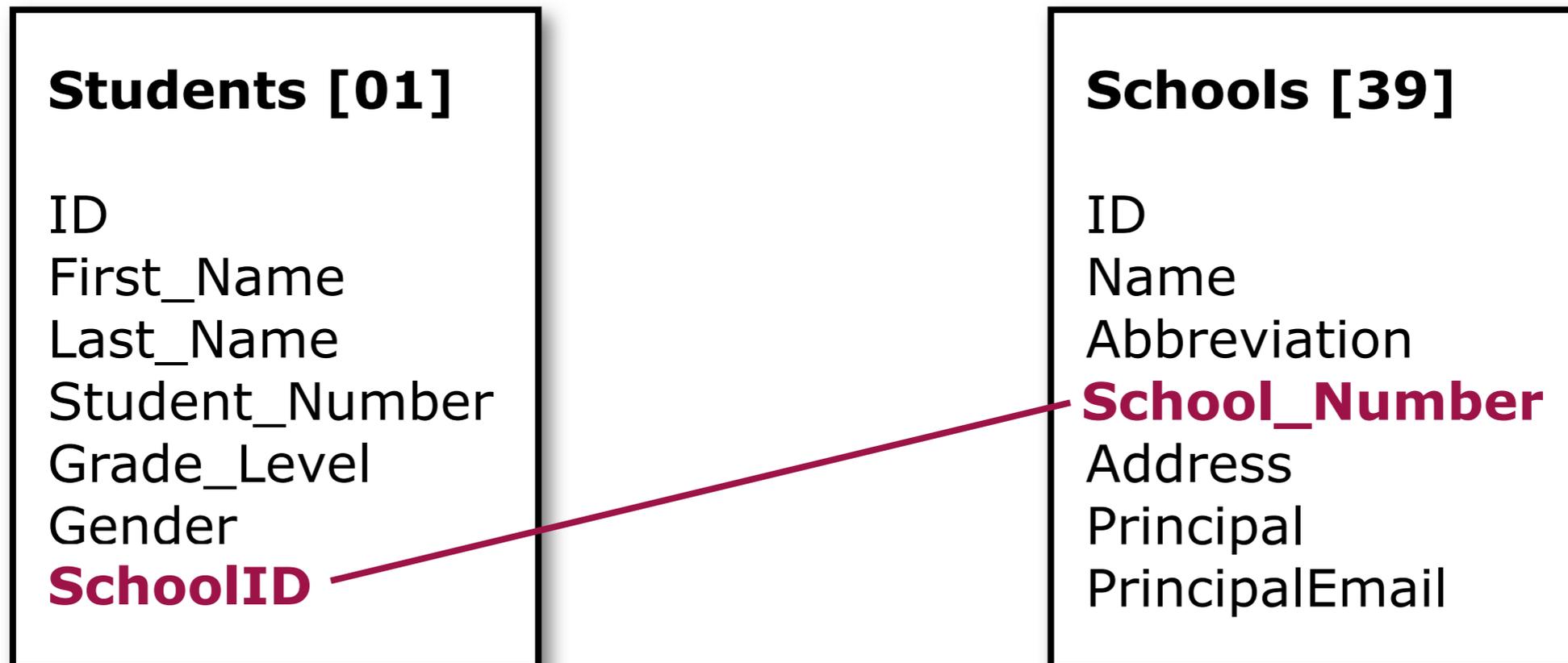


Table Relationship Diagrams

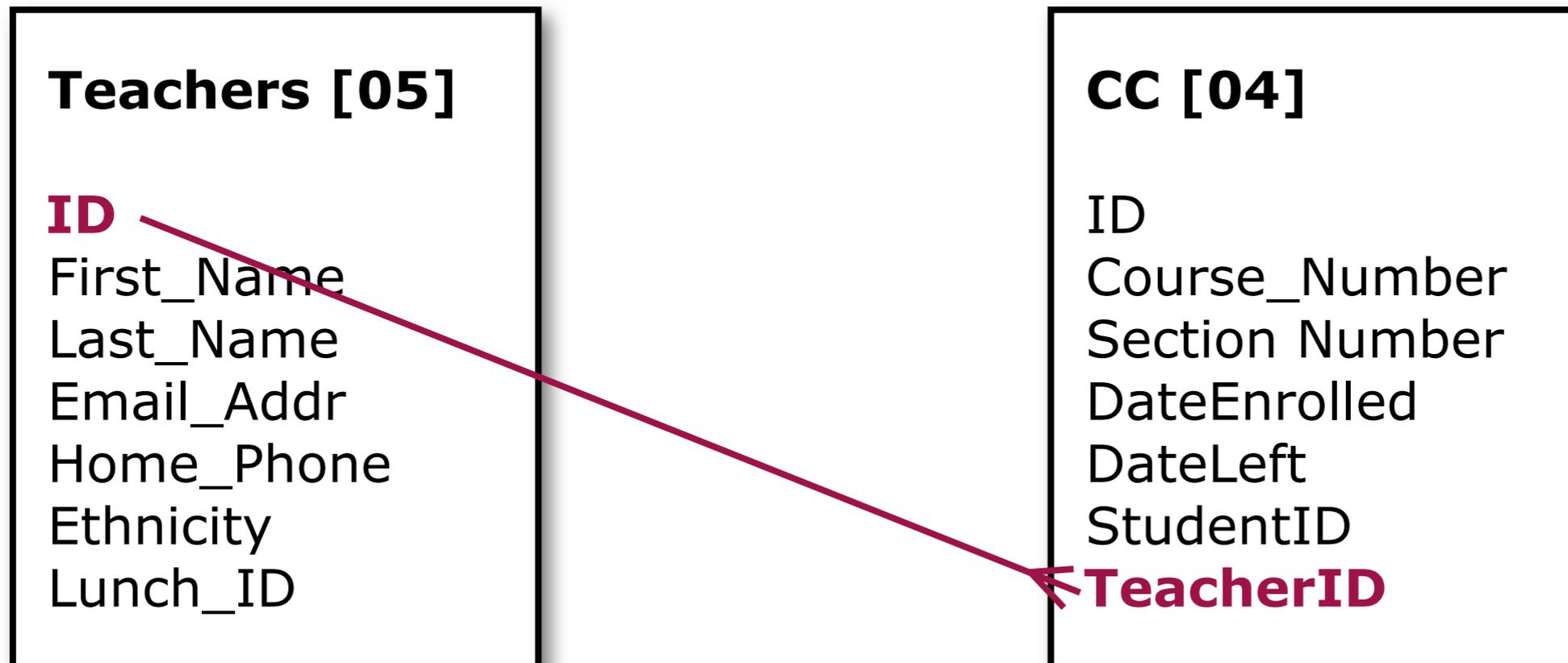


Table Relationship Status

The image shows a screenshot of a Facebook profile for a page named "CC Table [04]". The profile is displayed in a blue-themed interface. On the left side, there is a navigation menu with a "farcebook" logo and a search bar. Below the search bar, there are links for "Home", "Profile", and "Account". The profile picture is a cartoon drawing of two eyes. The main content area shows the profile name "CC Table [04]" and an "Edit Profile" button. Below this, there are sections for "Basic Information", "Arts and Entertainment", and "Relationship Status". The "Relationship Status" section is highlighted with a red arrow pointing to the text "It's Complicated". Other sections include "About You" (PowerSchool Database), "Employer" (Pearson Education), "Music" (Girls and Boys in School, Rock'N' Roll High School, etc.), and "Movies" (High School Musical, Fast Times At Ridgemont High, etc.). On the right side, there is a "Poke" section with a "Poke Back" button.

farcebook

Search Home Profile Account

CC Table [04] Edit Profile

Basic Information Edit

About You PowerSchool Database

Relationship Status It's Complicated

Employer Pearson Education

Arts and Entertainment Edit

Music Girls and Boys in School (Neon Trees), Rock'N' Roll High School (Ramonos), Another Brick in the Wall, Pt. 2 (Pink Floyd), Be True to Your School (Beach Boys)

Movies High School Musical, Fast Times At Ridgemont High, The Breakfast Club,

Friends (6)

Courses [02]

Schools [39]

Sections [03]

Students [01]

Teachers [05]

Poke Gen Table [06] Poked You. Poke Back

What Are Your Query Needs?

3

What Are Your Query Needs?

Quick Export

- Primary tables are Students and Teachers
- Export data from limited additional tables
- Limited to the school you are working in
- Can't save queries

Direct Database Export

- Export from any table
- Match fields from other tables
- Export from multiple schools
- More filtering
- Can't save queries



Export Using Template

- Export data from Students, Courses, CC, Teachers, and StoredGrades
- Limited to the school you are working in
- CAN save queries

SQL

- Export data from any table
- Export from unlimited tables simultaneously
- Export from multiple schools
- Detailed data filters
- CAN save queries

The Language of SQL

4

SQL - The Database Whisperer



SQL



Basic SQL Grammar and Vocabulary...

Get What?

SELECT *A list of names* field name (s)

From Where?

FROM *The Students table* table

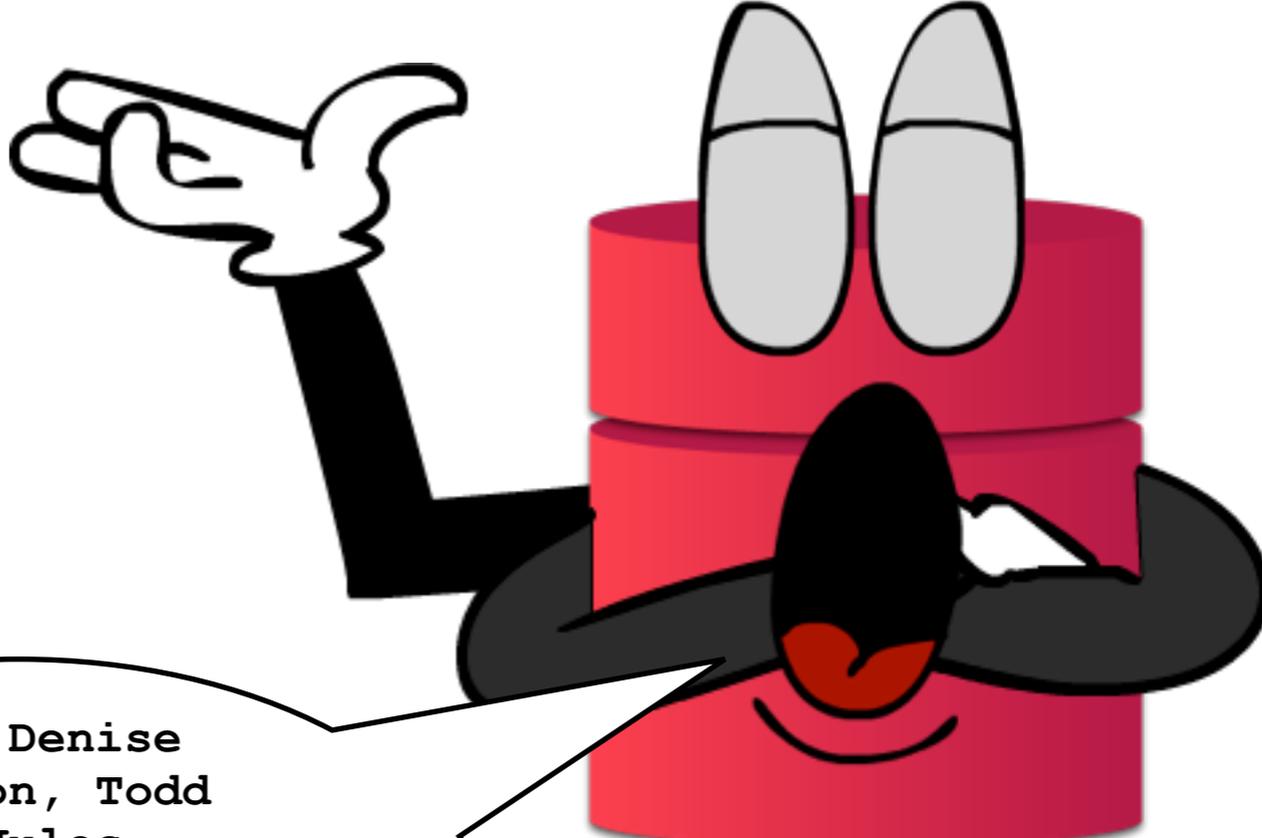
Special Instructions:

WHERE *Only graders only*



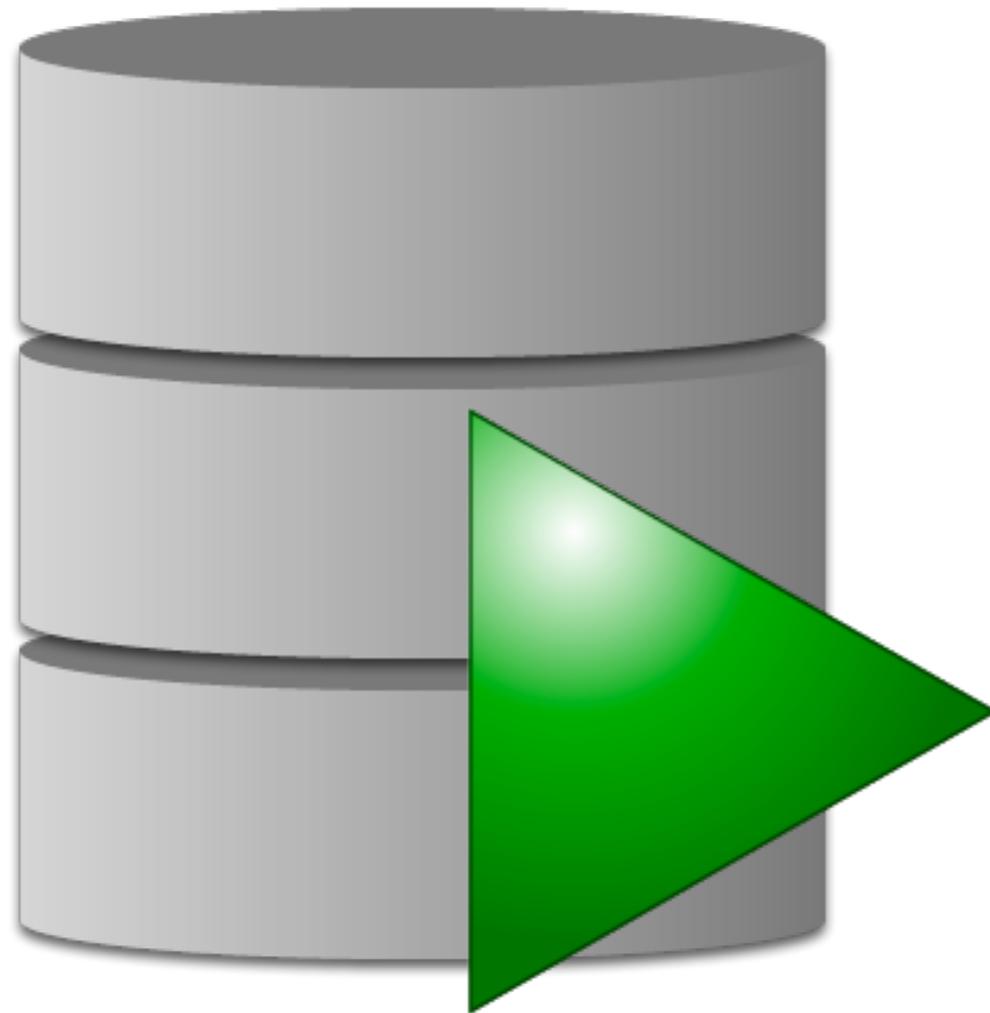
Basic SQL Grammar and Vocabulary...

```
SELECT lastfirst  
FROM students  
WHERE grade_level=9
```



Adams, Denise
Anderson, Todd
Chen, Jules
Dunn, Amy
Fenton, Peter
Fuentes, Jose
Harris, Megan
Jensen, Jamal
...

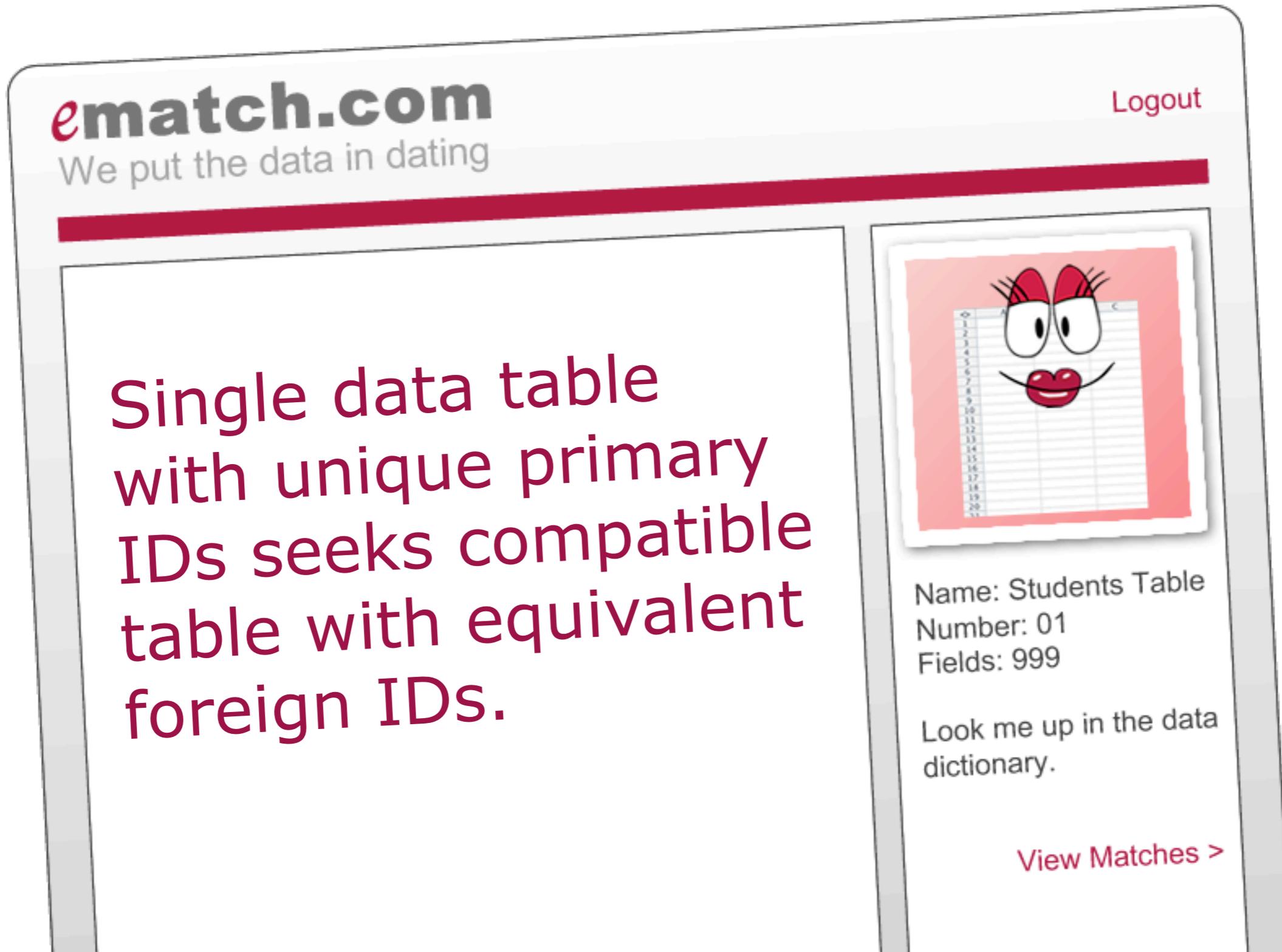
Now It's Your Turn



Complete hands-on activity 2:

Writing SQL Queries

What if a single table isn't enough?



eMatch.com
We put the data in dating

Logout

Single data table with unique primary IDs seeks compatible table with equivalent foreign IDs.

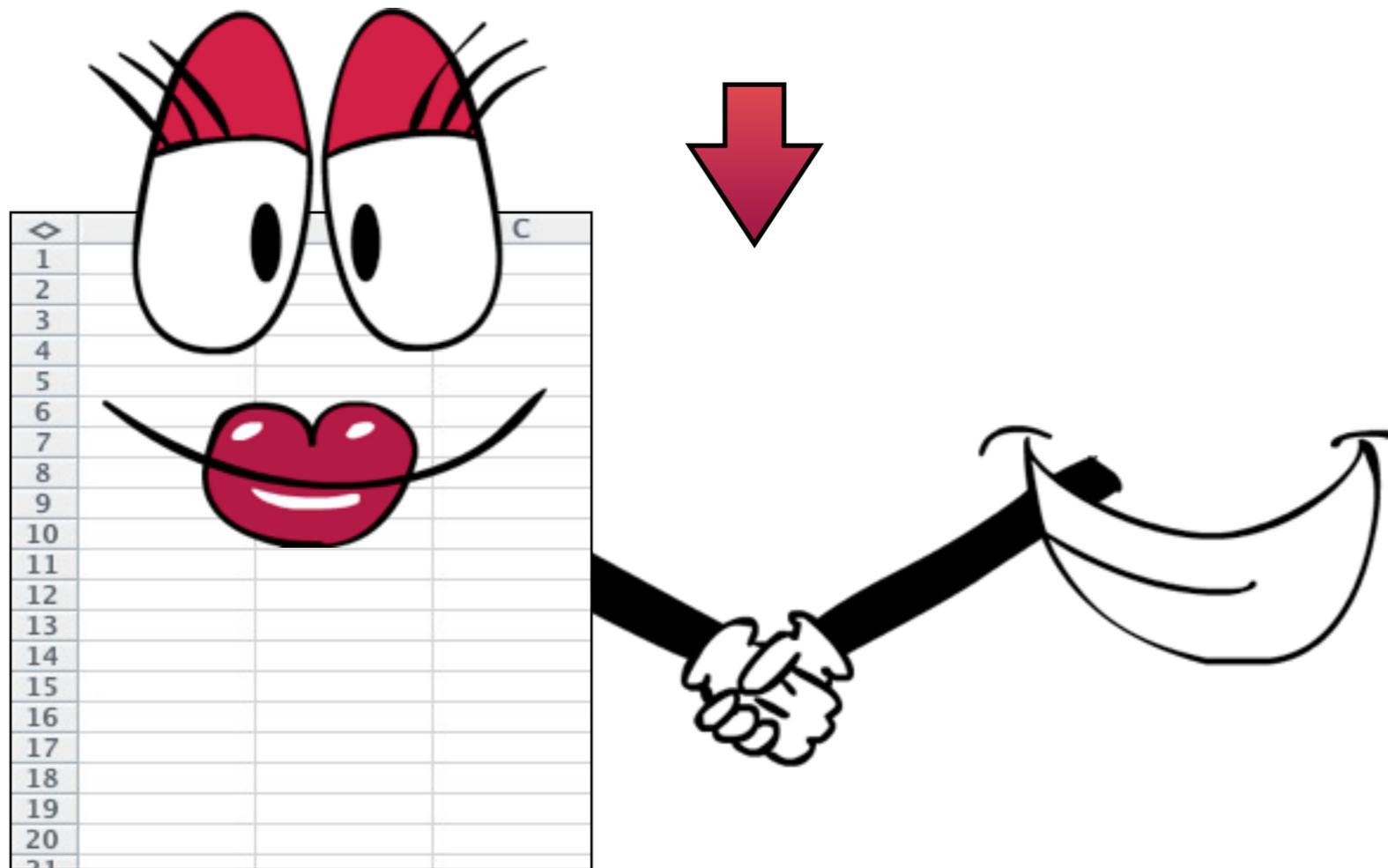


Name: Students Table
Number: 01
Fields: 999

Look me up in the data dictionary.

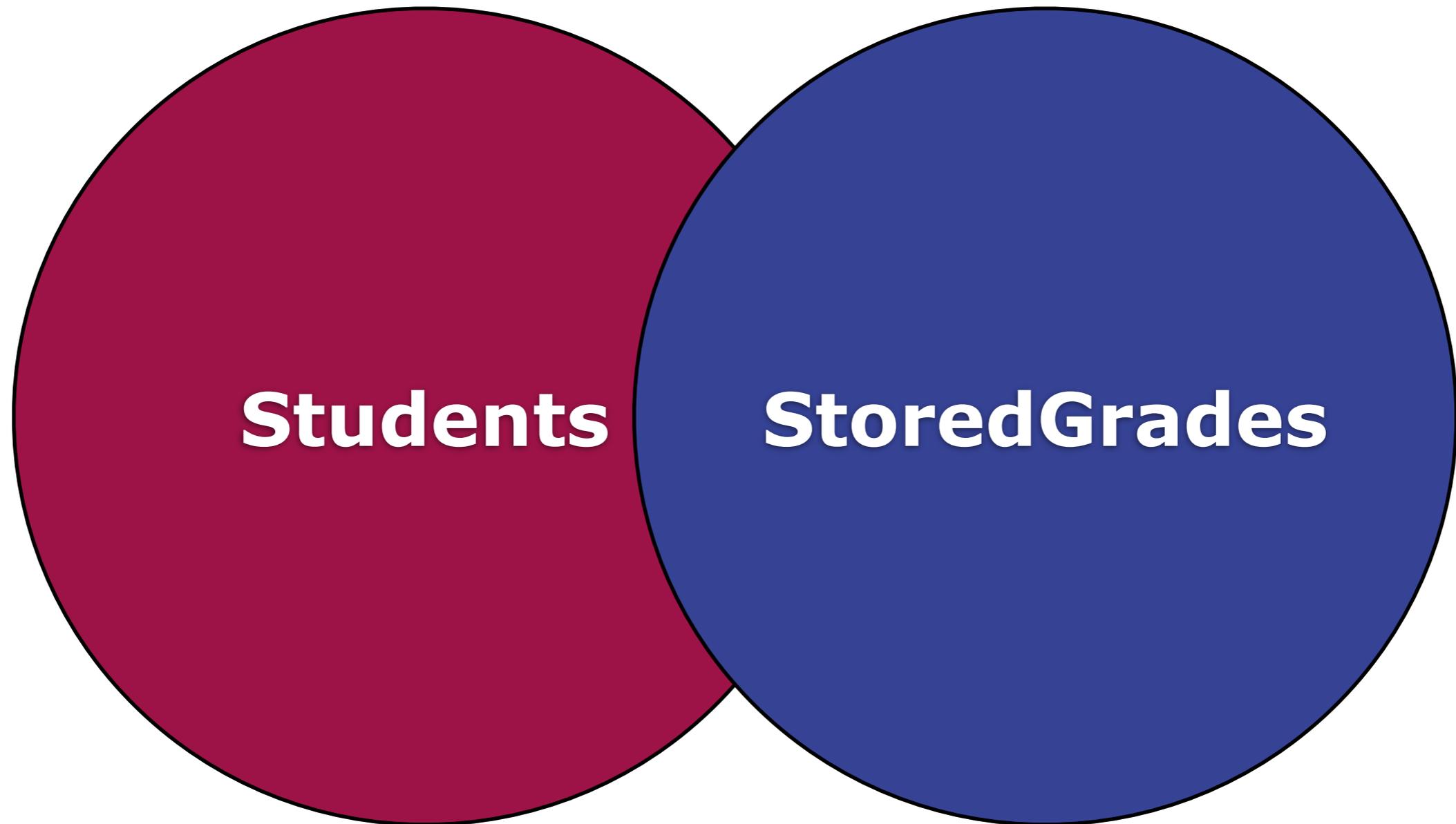
[View Matches >](#)

What if a single table isn't enough?



JOIN

The “Birds and Bees” of a JOIN...



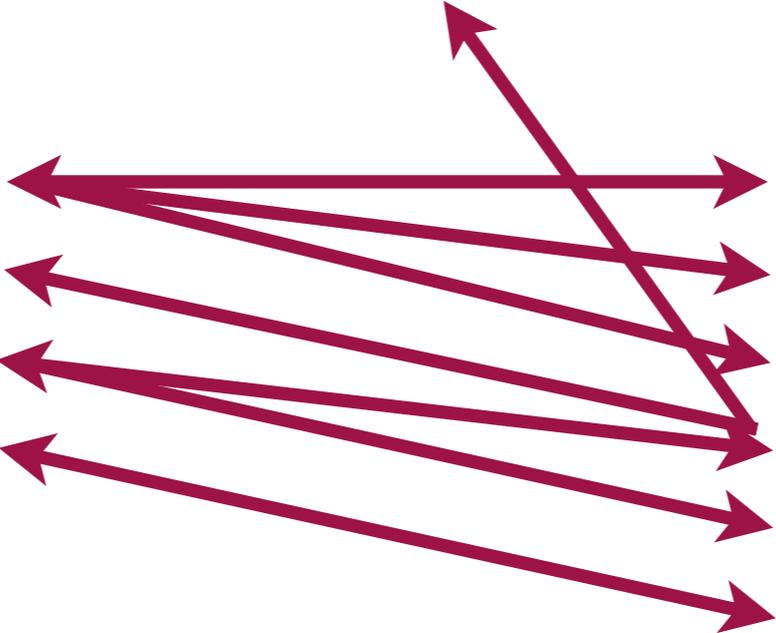
How a JOIN Works

Students

ID	Last_Name	First_name
109	Adams	Denise
110	Anderson	Todd
111	Chen	Jules
112	Dunn	Amy

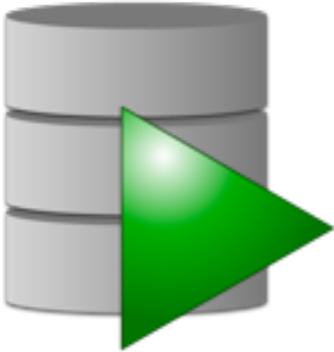
StoredGrades

StudentID	Course	Grade
109	Algebra	A
109	Biology	B+
109	Art	A-
111	Geometry	B-
111	US History	A
112	Algebra 2	C+
113	Chemistry	B-
114	Civics	A



Results

Adams	Denise
Adams	Denise
Chen	Jules

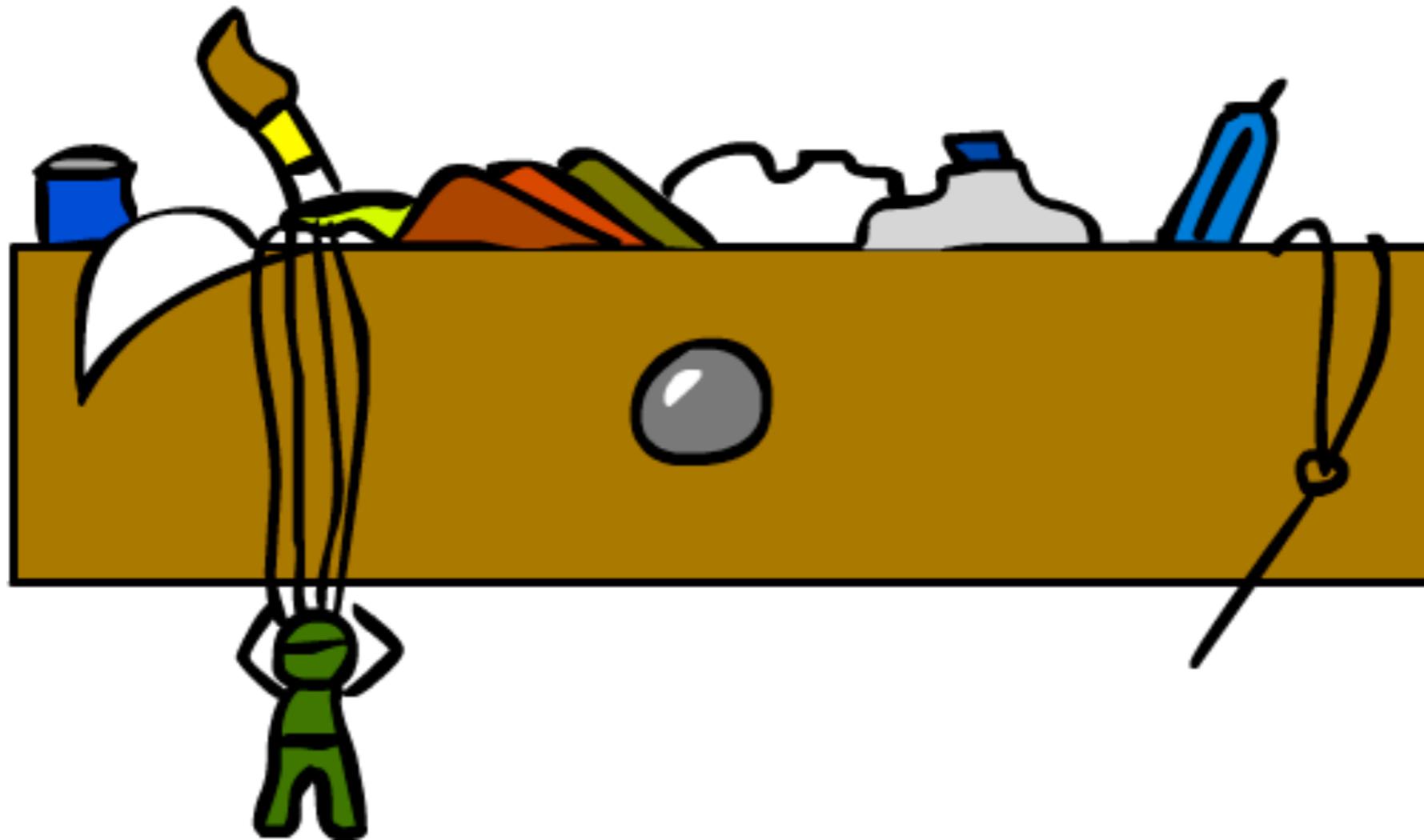


Using Views

5

What's a View?

Gen Table [06]



What's a View?

Students [01]

ID

First Name

Last_Name

Student_Number

Grade Level

Gender

SchoolID

Schools [39]

ID

School_Number

Name

Address

Abbreviation

SchoolPhone

Principal

Gen [06]

ID

Cat

Name

Value

Value2

SchoolID

YearID

PSSIS_Student_Demographics

Name

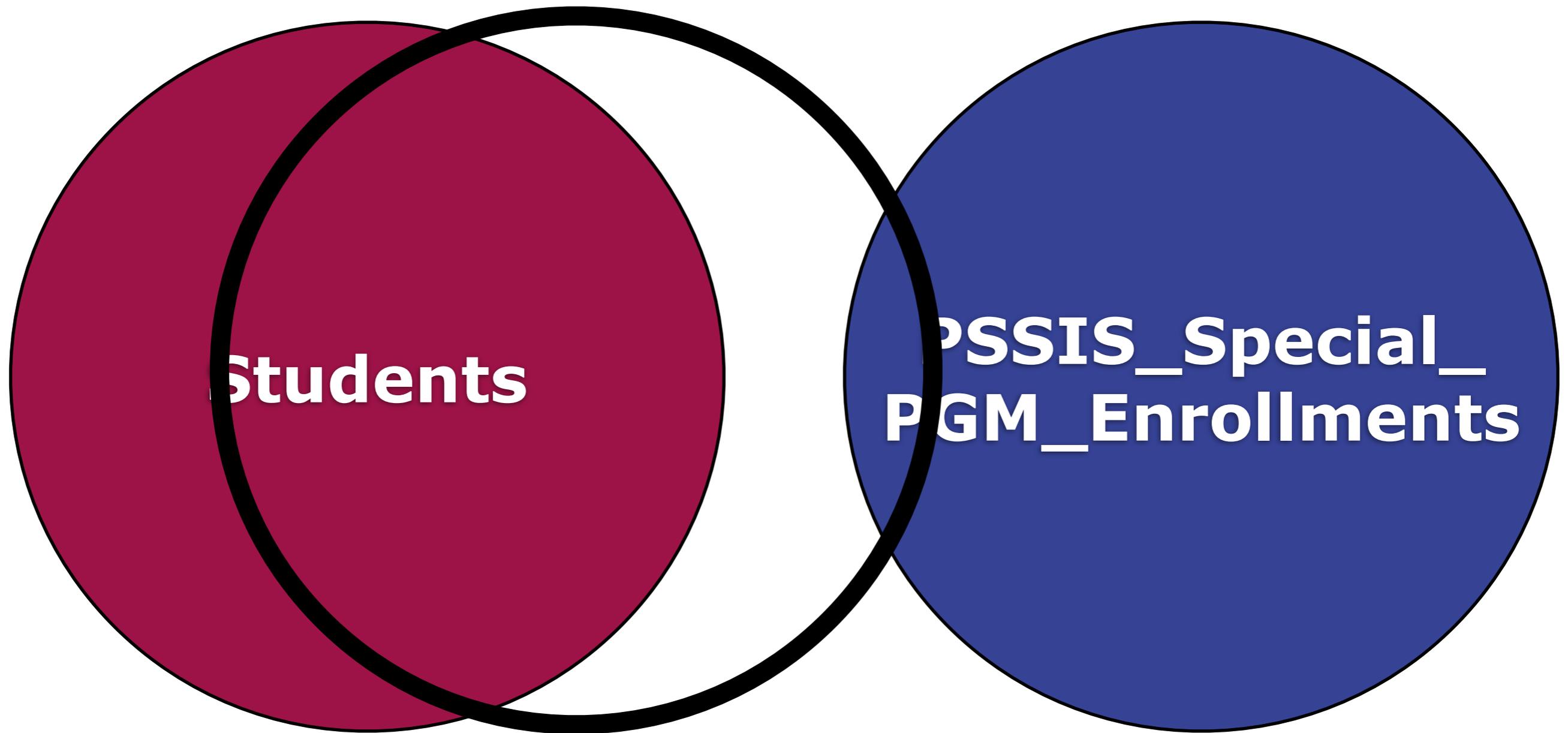
Student_Number

Current_School_Abbreviation

Gender

Ethnicity_Name

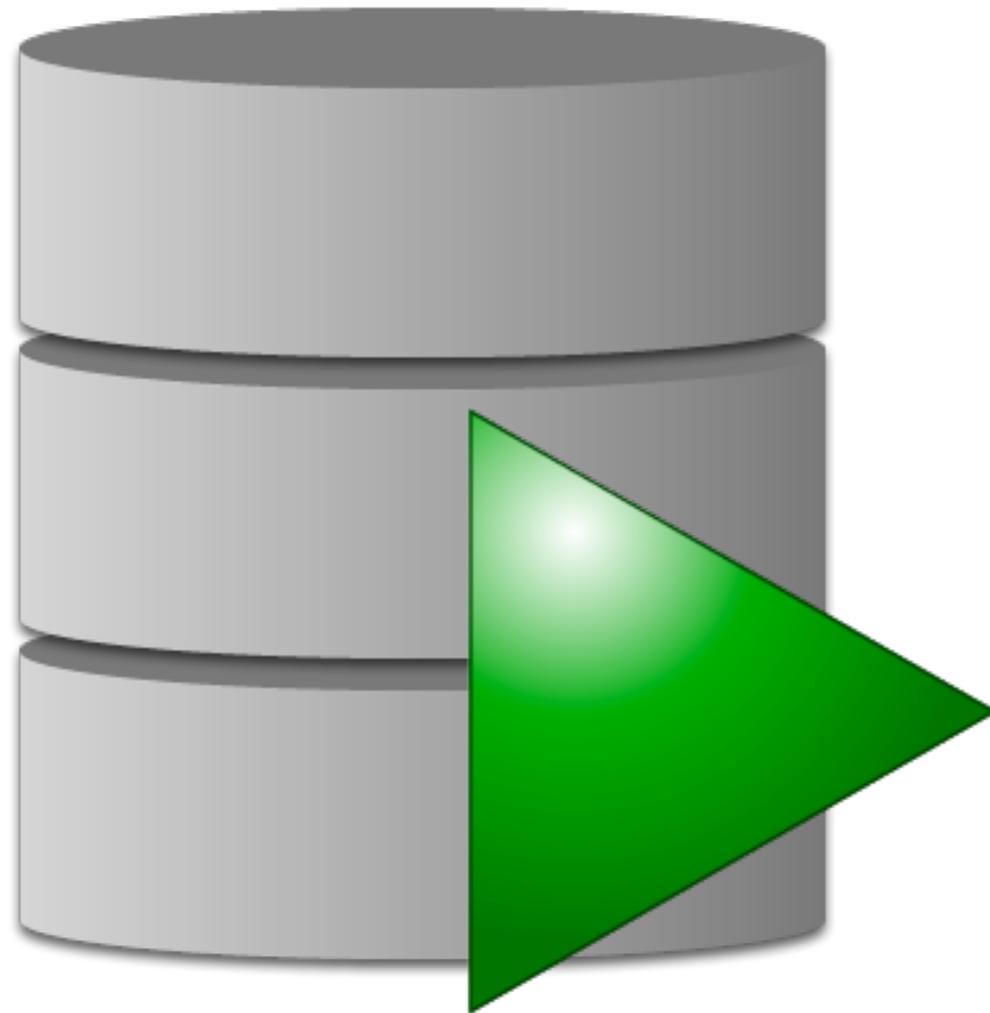
Other Types of JOINS



LEFT OUTER JOIN



Now It's Your Turn



Complete hands-on activity 3:

Using Views in SQL Queries

Let's Review...

Question 1

Who Am I?

```
SELECT name
FROM tvtherapist
WHERE degree='phd' AND books=13 AND
friend='Oprah'
```

Question 1



Question 2

What is a set of linked tables?

A Relational Database

B A Buffet

C A Spreadsheet

D Something cool in Excel

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What is a set of linked tables?

A Relational Database

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C A Spreadsheet

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Question 3

What represents each instance in a table and must be unique and not null?

A Foreign Key

B Special ID

C Primary Key

D Important ID

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Question 4

What does the WHERE vocabulary do in SQL?

A Adds a Filter

B Makes a JOIN

C Names an Alias

D Sorts Data

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Question 5

Which of the following pulls data from multiple tables together into a “virtual table?”

A jQuery

B MS Query

C JavaScript

D A View

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Key Points

- Relational Database Structure
- Basic SQL Vocabulary
- Basic Joins
- Database Views

Question and Answer



Don't Forget...



ALWAYS
LEARNING