CSE 444 section, June 24
Today

• IISQLSRV and Management Studio
• Hello, SQL
About section and the TA

• Section in EE1 045 on Thursdays
  – Feel free to come to either

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Connecting to IISQLSRV
IISQLSRV connection settings

- Server: iisqlsrv.cs.washington.edu
- Use SQL Server Authentication
- Username: your UW NetID
- Password: [redacted]
  - Write this down NOW, we won’t say it again
  - You’ll have to change it on first login
IMDB database

Actor \((id, \text{fname}, \text{lname}, \text{gender})\)
Movie \((id, \text{name}, \text{year}, \text{rank}* )\)
Directors \((id, \text{fname}, \text{lname})\)
Casts \((\text{pid}, \text{mid}, \text{role})\)
Movie_Directors \((\text{did}, \text{mid})\)
Genre \((\text{genre}, \text{mid})\)

* currently unused, always null
A simple query

Tell me all you know about every movie called “Go Tell It On The Mountain”.
A simple query

Tell me all you know about every movie called “Go Tell It On The Mountain”:

SELECT * 
FROM Movie 
WHERE name = 'Go Tell It On The Mountain';
A simple query

Tell me all you know about every movie called “Go Tell It On The Mountain”:

SELECT * ← Every column...
FROM Movie ← ... of every row in Movie...
WHERE name = 'Go Tell It On The Mountain'; ← ... whose “name” field is this
A simple query

Now tell me only the year each movie was made:

SELECT  \textbf{YEAR} \leftarrow \text{only the Year column}... 
FROM Movie
WHERE name = 'Go Tell It On The Mountain';
More examples

• Names of all Star Wars movies
• All Star Wars movies made in 2000 or later
• Names and production years of all Star Wars movies from earliest to latest
Something a little harder...

Who directed The Empire Strikes Back?
Answer: joins!

Who directed The Empire Strikes Back?

**Movie** (*id*, name, year, rank)

**Directors** (*id*, fname, lname)

**Movie_Directors** (*did*, *mid*)

Need to *join* (combine) the data from these tables!
Director of Empire Strikes Back
SELECT d.id, d.fname, d.lname
FROM Movie m, Movie_Directors md, Directors d
WHERE m.id = md.mid AND
    md.did = d.id AND
    m.name = 'Star Wars: Episode V - The Empire Strikes Back';
Director of Empire Strikes Back

SELECT d.id, d.fname, d.lname
FROM Movie m, Movie_Directors md, Directors d
WHERE m.id = md.mid AND md.did = d.id AND m.name = 'Star Wars: Episode V - The Empire Strikes Back';
How do joins work formally?

Recall from discrete math (311 or 321) the *Cartesian product* of sets $\mathbf{X}$ and $\mathbf{Y}$:

– All ordered pairs $(x, y)$ such that $x$ in $\mathbf{X}$, $y$ in $\mathbf{Y}$
How do joins work formally?, cont.

Logically, joins work as follows:

1. Take Cartesian product of the sets of all rows in tables being joined
2. Use the join conditions to filter out only those tuples that match

Much faster (and uses less memory) in practice
Aggregates

Sometimes we just want summary or extreme-case data

– All Star Wars movies $\rightarrow$ number of Star Wars movies

– Dates of all movies $\rightarrow$ date of earliest movie
Aggregates

SQL has *aggregation operators* to help with this
– count, sum, avg, min, max
Aggregates

Sometimes we just want summary or extreme-case data

- All Star Wars movies $\rightarrow$ number of Star Wars movies
- Dates of all movies $\rightarrow$ date of earliest movie
Aggregates

Sometimes we just want summary or extreme-case data

- SELECT * FROM Movie WHERE name LIKE...
- SELECT COUNT(*) FROM Movie...

- Dates of all movies → date of earliest movie
Aggregates

Sometimes we just want summary or extreme-case data

- `SELECT * FROM Movie WHERE name LIKE...` → `SELECT COUNT(*) FROM Movie...`
- `SELECT year FROM Movie` → `SELECT MIN(year) FROM Movie`
Aggregates and grouping

Aggregates are not so useful by themselves...

But combined with *grouping* (lecture 3), they become very powerful!
Aggregates and grouping

List actors’ first names and their frequency, from most to least popular:

```
SELECT fname, COUNT(*) AS freq
FROM Actor
GROUP BY fname
ORDER BY freq DESC;
```
Project 1

More fun with the IMDB database!
Some queries need more advanced SQL

Posted to web, due July 7

This weekend: log in to IISQLSRV!
If you can’t, email me: michaelr@cs