Practice queries

• What are the names of all teachers Bart has had?

```
SELECT DISTINCT t.name
FROM teachers t
JOIN courses c ON c.teacher_id = t.id
JOIN grades g ON g.course_id = c.id
JOIN students s ON s.id = g.student_id
WHERE s.name = 'Bart';
```

• How many total students has Ms. Krabappel taught, and what are their names?

```
SELECT DISTINCT s.name
FROM students s
JOIN grades g ON s.id = g.student_id
JOIN courses c ON g.course_id = c.id
JOIN teachers t ON t.id = c.teacher_id
WHERE t.name = 'Krabappel';
```
HTML tables: `<table>`, `<tr>`, `<td>`

A 2D table of rows and columns of data (block element)

```
<table>
  <tr><td>1,1</td><td>1,2 okay</td></tr>
  <tr><td>2,1 real wide</td><td>2,2</td></tr>
</table>
```

<table>
<thead>
<tr>
<th>1,1</th>
<th>1,2 okay</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,1 real wide</td>
<td>2,2</td>
</tr>
</tbody>
</table>

- **table** defines the overall table, **tr** each row, and **td** each cell's data
- tables are useful for displaying large row/column data sets
- NOTE: tables are sometimes used by novices for web page layout, but this is not proper semantic HTML and should be avoided
### Table headers, captions: `<th>`, `<caption>`

```html
<table>
  <caption>My important data</caption>
  <tr>
    <th>Column 1</th>
    <th>Column 2</th>
  </tr>
  <tr>
    <td>1,1</td>
    <td>1,2 okay</td>
  </tr>
  <tr>
    <td>2,1 real wide</td>
    <td>2,2</td>
  </tr>
</table>
```

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,1</td>
<td>1,2 okay</td>
</tr>
<tr>
<td>2,1 real wide</td>
<td>2,2</td>
</tr>
</tbody>
</table>

- **th** cells in a row are considered headers; by default, they appear bold
- a **caption** at the start of the table labels its meaning
Styling tables

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,1</td>
<td>1,2 okay</td>
</tr>
<tr>
<td>2,1 real wide</td>
<td>2,2</td>
</tr>
</tbody>
</table>

My important data

- all standard CSS styles can be applied to a table, row, or cell
- table specific CSS properties:
  - `border-collapse, border-spacing, caption-side, empty-cells, table-layout`
The border-collapse property

```css
table, td, th { border: 2px solid black; }

body

```
The rowspan and colspan attributes

```
<table>
  <tr><th>Column 1</th><th>Column 2</th><th>Column 3</th></tr>
  <tr><td colspan="2">1,1-1,2</td><td rowspan="3">1,3-3,3</td></tr>
  <tr><td>2,1</td><td>2,2</td></tr>
  <tr><td>3,1</td><td>3,2</td></tr>
</table>
```

- **colspan** makes a cell occupy multiple columns; **rowspan** multiple rows
- **text-align** and **vertical-align** control where the text appears within a cell
Column styles: `<col>`, `<colgroup>`

- `<col>` tag can be used to define styles that apply to an entire column (self-closing).
- `<colgroup>` tag applies a style to a group of columns (NOT self-closing).

```html
<table>
    <col class="urgent" />
    <colgroup class="highlight" span="2"></colgroup>
    <tr><th>Column 1</th><th>Column 2</th><th>Column 3</th></tr>
    <tr><td>1,1</td><td>1,2</td><td>1,3</td></tr>
    <tr><td>2,1</td><td>2,2</td><td>2,3</td></tr>
</table>
```

**HTML**

<table>
<thead>
<tr>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,1</td>
<td>1,2</td>
<td>1,3</td>
</tr>
<tr>
<td>2,1</td>
<td>2,2</td>
<td>2,3</td>
</tr>
</tbody>
</table>

**Output**
Don't use tables for layout!

• (borderless) tables appear to be an easy way to achieve grid-like page layouts
  • many "newbie" web pages do this (including many UW CSE web pages...)
• but, a **table** has semantics; it should be used only to represent an actual table of data
• instead of tables, use **divs**, widths/margins, floats, etc. to perform layout

• tables should not be used for layout!

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Designing a query

• Figure out the proper SQL queries in the following way:
  • Which table(s) contain the critical data? (**FROM**)
  • Which columns do I need in the result set? (**SELECT**)
  • How are tables connected (**JOIN**) and values filtered (**WHERE**)?
• Test on a small data set (**imdb_small**).
• Confirm on the real data set (**imdb**).
• Try out the queries first in the MySQL console.
• Write the PHP code to run those same queries.
  • Make sure to check for SQL errors at every step!!