What is the purpose of this Lab?

- To identify and understand:
- How to get results from **any database** using:
  1. Basic and Advanced searches.
  2. Boolean Operators.
  3. Wildcards.
What is a database?

- A database is “a structured collection of records or data that is stored in a computer”.
- In example, Google is a giant database that contains records of webpages that match certain terms (keywords or keyphrases).

Let’s pretend we are searching Google for webpages about *vehicles*; we will need to search using terms called *keywords* or *keyphrases*. 
How to get results from any database, Part 2

- **What is a term?**
  - A keyword or keyphrase used for searching databases.

- **What is a keyword?**
  - The *exact word* you are looking for.
  - Here are some vehicle related keywords:
  - *Note: Keywords should NOT be enclosed in any quotes; they are only in single-quotes and separated by commas here to identify them separately from each other.*

- **What is a keyphrase?**
  - A keyphrase is the *exact ordered group of keywords* you are looking for.
  - A keyphrase MUST be in double-quotes, like this:
    - “solar powered vehicle”
  - Since order matters, the following keyphrases are all different and will give different results! Click on each to prove it to yourself that they are different:
    - Google Search: “solar powered vehicle” is not the same as…
    - Google Search: “powered solar vehicle” which is not the same as…
    - Google Search: “vehicle powered solar”
  - Think about why there are NO results for “vehicle powered solar”; have you ever heard someone say the exact phrase “vehicle powered solar”? Probably not.

- **IMPORTANT! A list of keywords gives different results than a keyphrase:**
  - These two searches will give completely different results (click on them to see):
    - Google Search: solar powered vehicle
    - Google Search: “solar powered vehicle”
  - Notice that some of the webpages in the results are the same, while others are different, and the pages are listed in a different order!
  - Think about why this proves that they are not the exact same search.
What is a search?

- A search is the action performed when you give a collection of keywords and/or keyphrases to a database, and it gives you results back.
  - A search can contain keywords, keyphrases, **Boolean Operators**, and **Wildcards**.

What are results?

- Results are the collection of records returned; in this case, a collection of links to webpages.
What is a **Boolean Operator**?

- An operator that *combines exactly two terms* to get results.
- There are exactly **THREE** Boolean Operators that give more or less results when combining two terms:
  - The operators are: **OR**, **AND** and **NOT**.

**More results:**
- Boolean operator: **OR**
  - Example Search: `car OR truck`
  - Results include:
    - Pages that ONLY have the term ‘car’, *and also*...
    - Pages that ONLY have the term ‘truck’, *and also*...
    - Pages that have BOTH the term ‘car’ and ‘truck’.

**Less results:**
- Boolean operator: **AND**
  - Example Search: `car AND truck`
  - Results include:
    - Pages that have BOTH the term ‘car’ and ‘truck’.
- Boolean operator: **NOT**
  - Example Search: `car NOT truck`
  - Results include:
    - Pages that ONLY have the term ‘car’ but NOT the term ‘truck’.
How can I visualize results from using Boolean Operators?

- We can use “Venn Diagrams” to visualize the results we get back when using Boolean Operators.
- What is a “Venn Diagram”?
  - It’s just a bunch of overlapping circles that help us “see” our results as being either inside or outside of the certain circles.
  - See the next few slides for examples.
Below are examples of visualizing the **OR** Boolean Operator with the terms ‘car’, truck’, and ‘motorcycle’ using Venn Diagrams.

Notice that the more the **OR** operator is used the *more* results you get.
How to get results from any database, Part 7

- Below are examples of visualizing the **AND** Boolean Operator with the terms ‘car’, truck’, and ‘motorcycle’ using Venn Diagrams.
- Notice that the more the **AND** operator is used the **fewer** results you get.

```
Outside the circles is everything that is:
NOT 'car'
NOT 'truck'
NOT 'motorcycle'

Everything that is:
NOT 'car'
NOT 'truck'
NOT 'motorcycle'
```
What is a **Wildcard**?
- A character that **substitutes** for a character or series of characters in a search.
- Wildcards are often used when searching for a partial term that is found in multiple other terms.

What are the **Wildcard Characters**?
- They can be different, depending on the database but they are usually the asterisk (*) and question mark (?):
  - Asterisk: * ➔ Stands for 0 or more characters.
  - Question: ? ➔ Stands for exactly 1 character.

Let’s see some examples:
- **Search:** `car*`
  - Results include words with **0 or more substituted characters**:
    - `car`
    - `cars`
    - `cartoon`
- **Search:** `car?`
  - Results include words with **exactly 1 substituted character**:
    - `cars`
    - `cart`
    - `card`
What is an advanced search?

- A search that gives you **more options** than just supplying keywords and/or keyphrases.

- Additional options in an advanced search include limiting results by:
  - Language (i.e. English, French, etc.),
  - File Format (i.e. .htm, .pdf, etc.),
  - Location of keywords/phrases (i.e. title, URL, etc.)
  - And much more!
Important Links

- Google Search Help
  - [http://www.google.com/support/bin/topic.py?topic=352](http://www.google.com/support/bin/topic.py?topic=352)
- Persistent Link to results.