Search Strategies

Every search system offers a variety of features and special search techniques. Rarely are any two systems searched exactly the same way.

Many systems offer help screens that provide valuable assistance with frequently used search strategies, as well as very specialized techniques, such as case sensitivity.

Often the only way to use the search systems efficiently is to access the help provided.
There are, however, some common search strategies that can be utilized for databases and other systems. These include:

- Boolean Operators
- Nesting
- Truncation
- Controlled Vocabulary
Search Strategy #1 - Boolean Operators

Over 150 years ago, George Boole, an English mathematician, developed Boolean Algebra. This brand of mathematics has been applied to set theory, probability, and computer circuit design. Its most important application for libraries has been its use in search strategies. We use "logical" operators to combine concepts in order to retrieve information focused on a topic of interest. Two or more concepts can be paired to satisfy research needs, and related terms can be grouped to express a single concept.
Boolean Operators - use of **AND, OR, XOR, NOT** or other logical operators for expanding or narrowing a search statement.

An example would be using "global warming OR greenhouse effect" to retrieve items that pertain to either of those concepts.

Another example would be to search "career AND engineering" to retrieve items that pertain to something about job opportunities for engineers.
What Boolean is NOT:

- Proximity Operators - such as same, with, near, adj
- Relational Operators - such as >, <, or + values
- Like most Internet searching - relevancy ranking
AND OPERATOR

• used to narrow focus of research
• results of search will contain not only one concept but also the other
• intersection of sets

Example: cars AND autos
OR OPERATOR (inclusive)

• Used to expand a search or widen its scope
• results will have at least one of the concepts
• may retrieve results that contain all identified concepts
• range searching and truncation are forms of OR-ing

*Example: cars OR autos*
XOR OPERATOR (exclusive)

• Used to expand a search or widen its scope
• results will have one of the concepts, but not both

Example: cars XOR autos (not both)
NOT OPERATOR

• eliminates results which include a particular search
• sometimes is called BUT NOT
• needs to be used very cautiously

*Example: autos NOT cars*
Search Strategy #2 - Nesting

• Nesting - the use of parentheses or other punctuation to group related concepts together to clarify the order in which a search is executed.

• The grouped concepts will be searched first, as a mathematical question.
Example:

(cats OR feline) AND (veterinary OR medicine)
Search Strategy #3 - Truncation
Truncation - the use of a symbol to indicate a search for a term containing a certain number of specific characters, after which any character or characters are acceptable.

A truncation symbol tells the computer to look for any character(s) in a spot. It functionally "OR"s terms together.
Examples:
seagrass* or sea grass* (seagrass or seagrasses or sea grass or sea grasses)

librar* (librarian or librarians or librarianship or library or libraries)
Caution:
• Sometimes truncating a word can bring irrelevant results (also called "false drops").

Example:
• If a student was searching for information on "artificial intelligence", he or she might choose to truncate the word "intelligence" in the manner below:
• OOPS - artificial in? CAUTION: Think of the results you might get.
Some truncation symbols take the place of one character within the word, such as in "behavio?r" or "wom*n" while others can replace any numbers of characters. This is sometimes called wildcarding.
Some examples of truncation symbols:

- * (lots of periodical databases)
- ? (a classic - from Dialog searching days -- Dialog was the first on-line database, circa 1972.)
- ! (less common, usually special, such as a single character)
- $ (Our Library Catalog)
- # (fairly uncommon, used in STN International and the Scientific and Technical Information Network databases)
• Truncation saves keyboarding, therefore time, errors(!), thinking, and sometimes money when used in "for-fee" databases, which charge users by the minute.

• Some databases "assume" truncation. This is called autostemming.
Search Strategy # 4 - Controlled Vocabulary

Controlled Vocabulary - use of terms or subject headings that have been previously identified as common or standard within a certain field
Some concepts are common across disciplines; however, certain specialized terms may be required to retrieve desired results within a specific database (controlled vocabulary). Many search systems offer this kind of specialized searching, as well as less specialized keyword searching.
Some examples include the terms frequently used to index psychology resources, which are found in the Thesaurus of Psychological Index Terms, and the vocabulary often used in engineering literature, which can be found in Ei Thesaurus.
The Library of Congress Subject Headings volumes provide the specialized terms of most academic library collections, including the library catalog of Florida Tech.
Help!

When you first access any type of database, it will be to your advantage to scroll through the Help! topics.

Doing so familiarizes you with the search strategies specific to that particular database.
Boolean operators: NOT

NOT can narrow your search, taking out the bad – and sometimes the good.
Boolean operators: AND

AND is another Boolean operator you might choose to use. You would use AND if you wish to narrow your search to records that contain two or more specified key terms.
Boolean operators: OR

An additional operator is OR. Using OR tells the computer to expand your search to either of the concepts you have listed.
Practice!

You type the search term INSTRUCTION into the Library catalog. The resulting number of entries returned is 1533. That is an enormous number of records to sort through. How would you narrow your search?
Practice

One way is to add an additional search term.

Think about exactly what type of information related to instruction you wish to find.

You are interested in the use of TECHNOLOGY in INSTRUCTION. How would you combine these terms? Think about which of the Boolean operators would be the best to use.
Practice

Using AND tells the computer to search for the term INSTRUCTION and the term TECHNOLOGY.

Now, you've narrowed your search results down; only 245 records were returned. However, you may be missing a number of relevant records.
Practice

Slightly expand your search by adding another relevant term, COMPUTERS.

You are really looking for how computers are affecting instruction, but realize the term TECHNOLOGY is synonymous with the term COMPUTER.
Practice

One way to use both terms is including the Boolean operator OR.
Practice

When you run this search strategy, you received **15,952**. That's even more than what you retrieved with your original result. Why were so many records returned?

The computer searched for the terms INFORMATION AND TECHNOLOGY together OR anything on the term COMPUTER. The computer did not combine the terms appropriately. To correct this mistake, you would want to use NESTING ( ).
Practice

Remember, NESTING tells the computer that grouped concepts will be searched first, as in a mathematical equation. This search, INSTRUCTION AND (TECHNOLOGY OR COMPUTER), yields 574 records from the Library catalog.
Practice

These are good search terms and use of search strategies, but you could have missed a few additional records that have other forms of the word COMPUTER. For example, you may have missed records containing the terms "computerized" or "computers." What would you use to include such records?
Practice

You can expand your search by using TRUNCATION.
Each system uses a specific character to express this search strategy. In the Library Catalog, we use the $ sign. ProQuest uses the * for its truncation symbol. How would you find out what symbol is used in any given database?
Practice

When you Truncate the term COMPUTER and run your search again, you retrieve 583 records. So, you broadened your search only slightly; however, you have included all relevant terms.
Practice

You are probably thinking that 583 is still a lot of records to review. Let's not forget our last search strategy: CONTROLLED VOCABULARY.
Practice

The Library of Congress Subject Headings (LCSH) volumes provide the specialized terms for most academic library collections, including the library catalog of Florida Tech.
Practice

You look in the LCSH to see if there is a narrower term for "technology." The term "educational technology" is listed, so you decide to include it in your search. Of course, the Boolean operator AND is needed to complete the search string.
This search string, INFORMATION AND (TECHNOLOGY OR COMPUTER*) AND EDUCATIONAL TECHNOLOGY, retrieves 112 records, which is a reasonable number.
Practice

To limit your search to more recent publications, you may choose to narrow the search by year in the Library catalog. Limiting the search to items dated 1997 to 2008 will retrieve 31 records.
Practice

Use what you learned about HELP, BOOLEAN, TRUNCATION, NESTING, and CONTROLLED VOCABULARY from this human search string example to help locate information resources for your next research topic.