Using Boolean Operators to Refine your Search

When Sammy Bearkat learned about searching SamCat and library databases, the reference librarian who was helping him discussed Boolean operators and told him that they help refine his search. But Sammy’s only human…or a bearkat… and needs to be able to review in order to get more examples and understand better.

Fortunately, Sammy’s smart enough to know that if he has a research question, the best person for him to talk with is a reference librarian. So, after class he stopped by the reference desk at the Newton Gresham Library and asked the librarian there to explain Boolean operators to him.

What are Boolean operators? Quite simply, they are three words: AND, OR, and NOT that can be used in searches to make the catalog or database return results that are more relevant to your topic. The term comes from the 19th century mathematician, George Boole, who is considered one of the fathers of mathematical logic. It is because Boolean is derived from his name that the word is usually capitalized. But, Sammy doesn’t need to know that. He does need to know how do Boolean operators work. Let’s take them one at a time. Perhaps the most commonly used operator is the word AND. Unlike everyday speech, in which the word AND makes things bigger, the Boolean AND makes your search results smaller. When you need to narrow your search, reducing the number of items returned by the catalog or database’s search engine, one method is to make your search more specific by adding search terms to the original. These terms are connected with the Boolean operator AND. When you add a second or third term to your search using the Boolean AND, the search engine returns only results that contain all of the search terms, thus AND narrows or refines your search. You may remember that Sammy’s general topic was physical fitness. But in SamCat he found nearly a thousand titles. That is far too many. The first thing Sammy did was put quotation marks around the phrase ‘physical fitness’.

By going through the library’s online instruction module on advanced searching, Sammy Bearkat knew that searchers used quotation marks to keep words from phrases together. To make sure that ‘physical’ will be adjacent to ‘fitness’, Sammy uses single quotation marks which SamCat supports. Most databases and internet search engines support double quotation marks instead.

Now that the library catalog is looking for the specific phrase ‘physical fitness’, Sammy’s results have reduced from 996 to 962. Well that’s better, but that’s still far too many items to look through.

So he considered how he might refine his search. He decided to learn whether one of his favorite sports ‘golf’ had any impact on physical fitness. To do this, Sammy added the term ‘golf’ to his search. Notice that he used the drop-down box to change the field from Author to Words or phrase. As you can see, the search boxes in the advanced search screen are joined by the Boolean AND by default. So how did Sammy’s search work? Let’s take a look.

He went from 962 to 4 items! Now that’s something Sammy can work with. In fact, it’s probably a little too limited. Sammy may need to broaden his search a bit.
The Boolean operator OR is used to broaden your search when there are multiple terms for one of your concepts. For example, if you are a teacher trying to understand your high school students, you might search ‘adolescents’ OR ‘teens’ OR ‘teenagers’ OR ‘youth’. When you use the Boolean OR, you are instructing the catalog or database search engine to return at least one of the search terms. So OR broadens or expands your search. Since different authors use different terms to describe the same thing, it’s wise to use the Boolean OR to ensure finding all the relevant information on your topic you can.

In Sammy’s case, he decided the kind of physical fitness information he was looking for might also use the word ‘exercise’. Here’s how he built his search.

Notice that instead of using the drop down box, Sammy typed the word OR and the search term ‘exercise’ right inside the search box. Boolean operators can be entered directly in the search boxes of SamCat and all of the library’s databases. Catalog and database search engines perform searches inside the boxes first, then combine those results from other search boxes.

How did this one work for Sammy? Remember he had 4 records when he searched ‘physical fitness’ and ‘golf’. Now he has 13 records to choose from. As you can see, OR did broaden his search.

The final Boolean operator is NOT. It is used to refine your search in a very specific way. NOT excludes records that contain the unwanted term. Here are some hints for helping to decide whether NOT is the right Boolean operator for your search results. First, use the search strategies you’ve developed, including the Boolean operators AND and OR. Then inspect your results, ask yourself: Are they on target? That is, do you find that, in general, the results look useful and on topic? Do you find within the results many instances of the same term that is irrelevant to your search? Persistence is important: if you are going to use NOT, you need to be able to identify a single term that regularly shows up.

Finally, ask yourself: Are there too many results to easily evaluate without using NOT?

If you ask all three of these questions and they can be answered with a yes, then NOT may be the best operator to use.

However, there is an important fact to keep in mind when you’re using the NOT operator. It must ALWAYS be the last operator you employ. Why? Once the NOT is in place, all functions after it are negated. This means that you will rarely really need NOT. And when it’s used well, it should provide the final set of results that you need.

Here is an example of how NOT works. Sammy returned to the topic of ‘physical fitness’ and found 961 results. He returned to the search screen, changed the default Boolean operator to NOT, changed the field from Author to Words or phrase, and typed ‘exercise’ into the search box.

As you see, Sammy’s search was effective. He reduced the search results from 961 to 585, but that wasn’t efficient. After all, 585 records are far too many. Sammy Bearkat would probably
have been better off using AND to connect ‘physical fitness’ with the people he was interested in. Like ‘college students’ or with a sport that interested him like ‘football’. Or even with both of these concepts.

Let’s review what we’ve discovered about Boolean operators. When you use the catalog or database search engines to combine search terms with AND, it returns to you only those records that have ALL of your search terms, thus reducing the results.

Combining search terms with the Boolean operator AND is probably the most effective way of reducing your search results. When you use OR to combine terms, it broadens your search by having the search engine return at least one of your search terms.

OR is best used when combining synonyms or key words that relate to the same topic, adding comprehensiveness to your search.
When you use NOT, it limits your search by excluding all records in which your search term is combined with the unwanted term. Remember, NOT must always be the last Boolean operator you employ.

Sammy Bearkat, we at the Newton Gresham Library hope that this refresher helps you with your searching. Don’t forget that whenever you have questions, we are here to help. Stop by the reference desk anytime the library is open. Or call us! The phone numbers are on the library’s website: library.shsu.edu. OR you can email us or chat by clicking on the Ask-A-Librarian link.

Whichever method you use, be sure to let us help you with your information needs.