Boolean Logic: Part I (AND, OR, NOT)

Boolean logic isn't just an extremely effective way to search, it is a tool that can save you a lot of time, energy and frustration. But what is it exactly?

Boolean logic is a way in which you, the searcher, are able to communicate with databases and search engines that require extremely specific and targeted language and strategies. The better you are able to communicate with the search engine, the better it can provide you with the information that you are looking for!

So let's say you are looking for information about the use of cats in dementia therapy. You've already watched the How Library Things Work video on How to Choose Keywords, and developed a search strategy which looks a little bit like this:

Feeling keen, you plug all of these words into the database and come up with… well… not exactly what you were looking for.

This is where Boolean Logic comes in. Boolean logic is a way in which we can narrow or broaden our search. Remember, an effective search gives us the maximum amount of relevant information, and the least amount of irrelevant information. Search engines and databases don't have a mind of their own, so we have to direct them to what is and what is not relevant.

First, let's talk about the Boolean operator **AND.**
The AND operator is way in which we can narrow a set of search results.   This may sound counter-intuitive, but bear with me. When we simply plug in a list of keywords, the database scans all of its documents to see if they contain any of our keywords. So, if we plug in the words 'cat therapy', we may get documents back that only talk about cats, or only talk about therapy. Obviously documents like 'Cats in the wild' or 'music therapy for infants' aren't very helpful to our research. We want words that lie in the sweet spot in the middle. This is where AND comes in. By linking our keywords with the Boolean operator AND, we are able to limit our results to only documents that contain both the words 'cat' AND 'therapy'.   By including the operator AND, we are ensuring that the database only returns documents that contain both keywords, not documents that contain one or the other. In this way, AND is a way to communicate to the database what words are important to our search, and filter out information that is irrelevant to us.

OR
But what if you have the opposite problem? What if you weren't retrieving all the documents in the database relevant to your topic? What if the most relevant articles to your topic don't actually contain the word cat or therapy? Can you think of an instance when this would happen?

How about synonyms? When we type in keywords, the database takes us very literally. So, even though when we type in the word therapy we may also like documents on treatments, the search engine doesn't know this. We need to specifically tell the search engine that we would also like documents that use the word treatment in addition to therapy, since they can mean the same thing. This is where the OR operator comes in. By telling the database we want articles

that contain the words 'treatment' OR 'therapy', we are able to retrieve more relevant documents than if we just used the word 'therapy'.   This will increase the number of relevant results that the database retrieves for us.

NOT
But wait. Did you know that P-CAT is a popular health care assessment tool? When you are typing in 'cat' the database is bringing back a ton of articles on P-CAT which is affecting your ability to find relevant documents. This is where the Boolean operator 'NOT' comes in. The NOT operator is a way in which we can exclude results that are not relevant to our search. The NOT operator works well when we are seeing a trend in documents that are irrelevant to our search, but are being recalled due to a specific word. So in our search, if we tell the database NOT 'P-CAT', we are able to exclude any documents that contain the word P-CAT and are probably not relevant to our topic. This saves us the time of having to manually search through our results to find the articles that are about the feline kind of cat and not the patient-centered assessment tool kind of cat.

To review:
Boolean operators are ways in which we can communicate exactly what we are looking for to databases and search engines. This video has talked about 3 Boolean operators: AND OR and NOT.
AND is a way in which we can narrow a set of results. A common use of the Boolean operator AND is to link main concepts or keywords. When we use AND, the search engine knows to only retrieve documents that contain all of the keywords.
OR is a way in which we can broaden a set of results. A common use of the Boolean operator OR is to include all synonyms in a search. When we use the operator OR, the search engine knows to retrieve results that contain one or more of the keywords
NOT is a another way to narrow a set of results. A common use of the Boolean operator NOT is to exclude terms that are frequently being retrieved that do not relate to our topic. When we use the word not, the search engine does not retrieve any documents that contain the specified word.

Make sure to also watch part II of this series, where we will talk about "" * and [].
For more information, check out McMaster library's Boolean Cheat Sheet
https://library.mcmaster.ca/sites/default/files/Boolean%20Cheat%20Sheet_0.jpg