

Boolean Operators

Boolean operators are named after George Boole, a 19th-century mathematician who developed boolean algebra, a form of symbolic logic. When doing research the operators are used to connect words or concepts. The three boolean operators are OR, AND, and NOT. The following demonstrates how to use a combination of operators to describe a research topic.

Suppose you are researching how genes affect a human's aging process. You have done some research and have learned at least one gene has been singled out and named mortality factor-4, sometimes referred to as morf4.

For this paper you have several concepts.

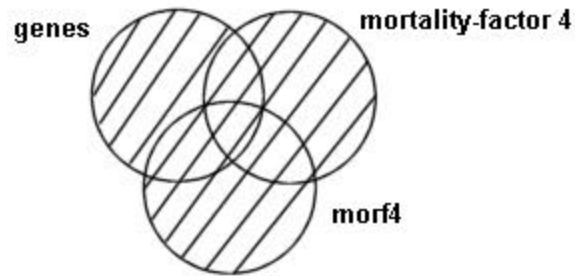
Concept A	Concept B	Concept C
genes	aging	humans
mortality factor-4	physiology	
morf4		

OR

When you put together concepts with OR, you are requesting documents containing at least one of the terms. **OR is used to join synonyms or related terms and is considered an *expander* because it broadens the search and increases the number of documents you would have retrieved if you had only used one term.**

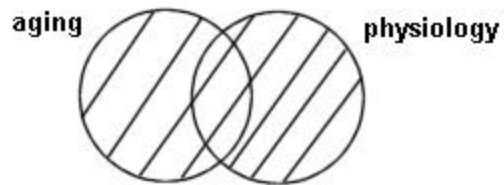
Concept A

genes or mortality factor-4 or morf4



Concept B

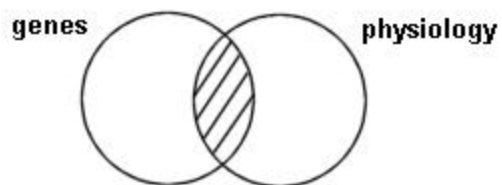
aging or physiology



AND

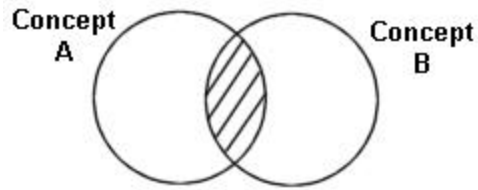
The operator **AND** allows you to link terms together and identify their common points. **AND** is a *limiter* because it requires all of terms to be in each document.

genes and aging



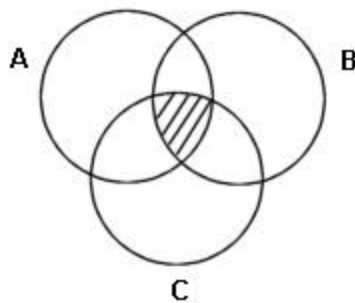
The next step is to put Concepts A&B together and using AND and OR.

(genes or mortality factor-4 or morf4) and (aging or physiology)



If this search produces too many "hits" then limit the results with the third concept **humans**.

(genes or mortality factor-4 or morf4) and (aging or physiology) and humans



NOT

NOT is a very strong operator because it excludes designated terms. At first this sounds perfect. However NOT should be used very carefully. The command **aging not genes** eliminates all works mentioning the word genes. You will lose documents discussing the aging process whenever the word "genes" is mentioned, even if it is only a minor portion of the report. You may not retrieve very valuable discussions.