

Boolean Logic
Or
When to Use OR, AND, and NOT

The principle of Boolean logic lets you organize concepts together in sets. These sets are controlled by use of *OR*, *AND*, and *NOT*.

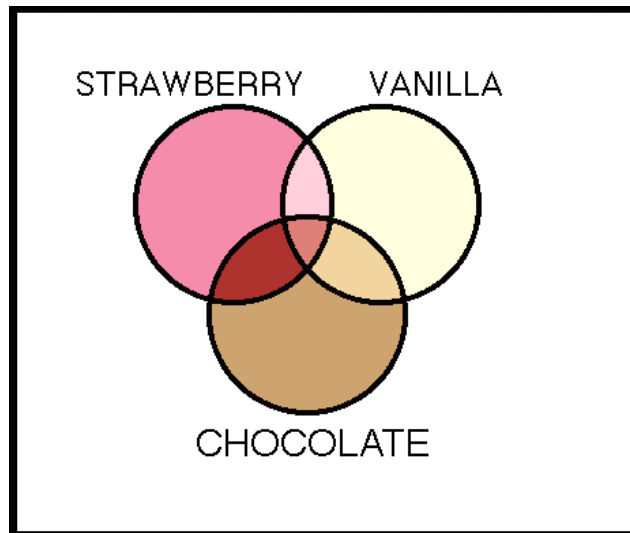
But forget about libraries and searching and think about ice cream. Imagine all of the possibilities a soft ice-cream machine could make if it offered chocolate, strawberry, and vanilla that could mix together any and all combinations of those flavors. There are seven possible combinations of ice cream flavors available: each flavor by itself, three combinations of two flavors in a swirl, plus all three flavors mixed together.

OR

In Boolean logic terms, a set that included any of these flavor combinations would be expressed like this:

strawberry *OR* vanilla *OR* chocolate.

The Venn diagram for this combination would look like this:



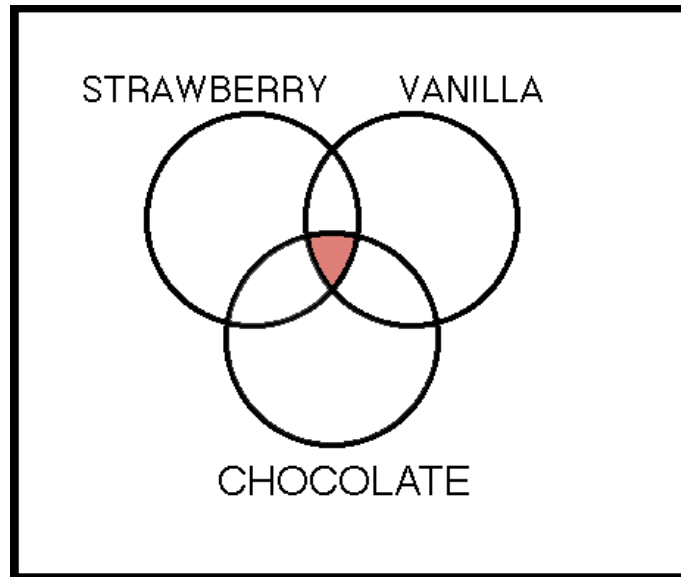
In database searching *OR* is often used to combine synonyms or like concepts together. Grouping together all the categories with an *OR* would broaden the set.

AND

Thinking back on ice cream, you aren't likely to eat every possible flavor of ice cream all at the same time, so you must narrow your selection. If you order a swirl of all three flavors combined, then chocolate, vanilla, and strawberry all must be included. In terms of Boolean logic, a set that includes all of three elements would be expressed as:

strawberry AND vanilla AND chocolate.

The Venn diagram for this combination would look like this:



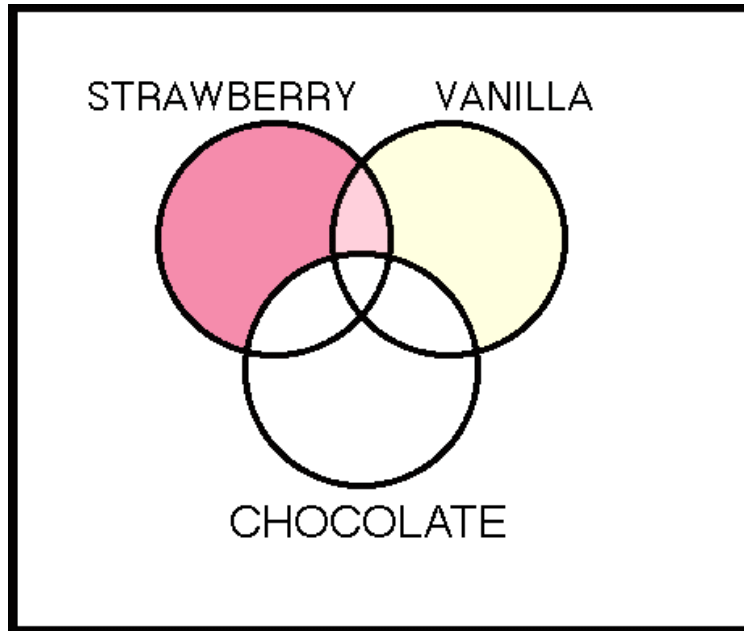
In database searching *AND* is used for linking together different concepts. Grouping the words with an *AND* creates a narrower set. Searching a database with the set college students *AND* behavior would retrieve records only if both words appear. A record about the economic status or religious beliefs of college students would not be retrieved unless the word "behavior" also appeared somewhere in the record.

NOT

Back to the ice cream. You may hate chocolate. I know it may be hard to do, but pretend you hate chocolate. Perhaps you have already eaten three brownies and don't want any more chocolate. When you order ice cream, if you do *NOT* want chocolate that would leave you with only three possibilities, strawberry by itself, vanilla by itself, or a swirl of strawberry and vanilla. In other words, you're subtracting a concept out of it. The resulting set would be expressed this way:

(strawberry OR vanilla) NOT chocolate

The Venn diagram for this combination would look like this:



In database searching, *NOT* is used to get rid of an unwanted concept. If you were interested in studying college students but not high school students, you could create a set college students *NOT* high school; however, *NOT* should be used sparingly.