



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

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

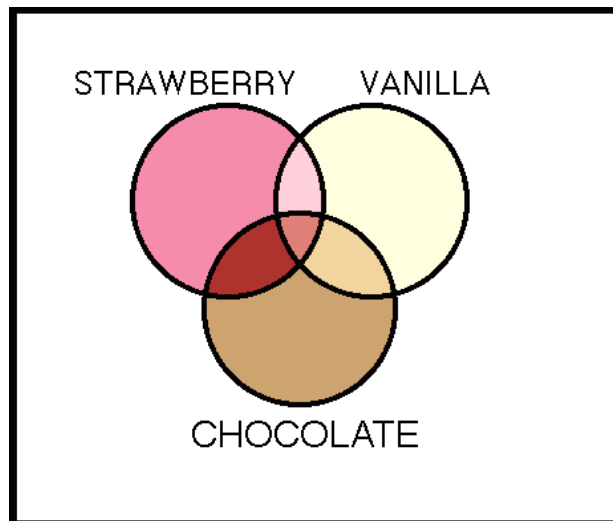
But forget about libraries and searching and think about ice cream. Imagine all the possibilities a soft ice-cream machine could make if it offered chocolate, strawberry, and vanilla, and could mix together any and all combinations of those flavors. There are seven possible combinations of ice cream 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:

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.

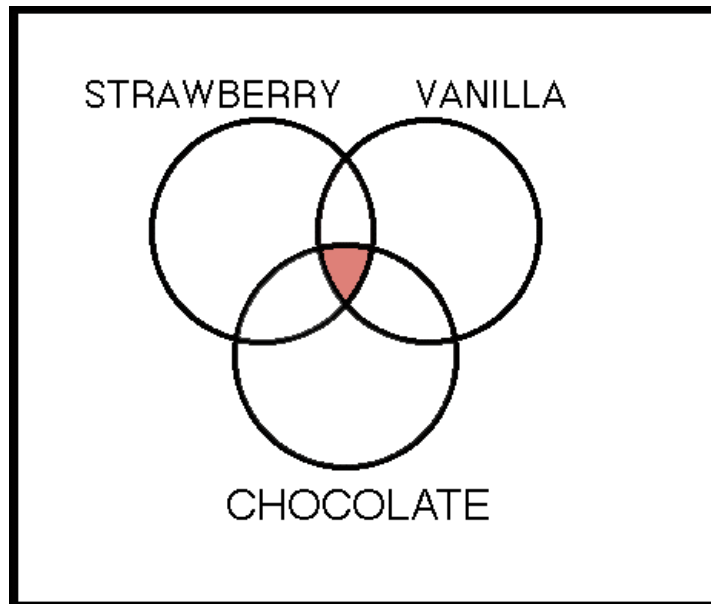
## AND

Thinking back on ice cream (I hope that's not too difficult), you aren't likely to eat every possible flavor of ice cream all at once, so you must **narrow** your selection even if you want a combination of flavors. If you order a swirl of all three flavors combined, 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:



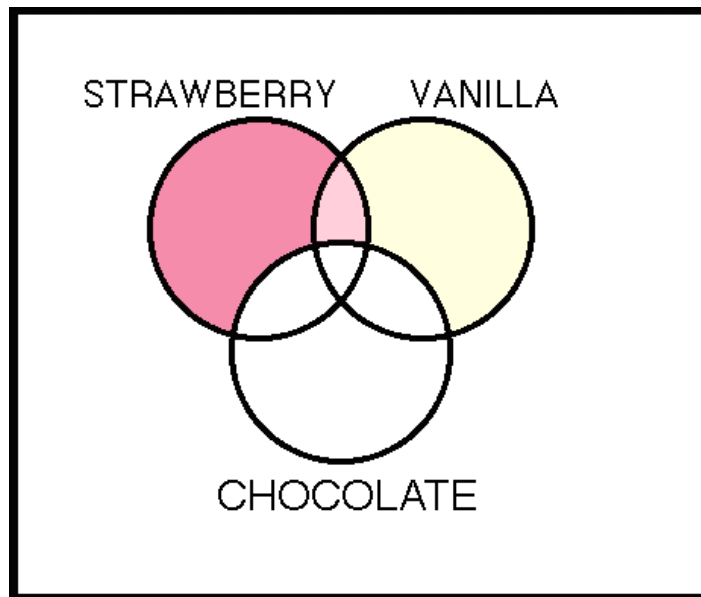
In database searching AND is used for linking together different concepts. Grouping the words with an AND creates a narrower set. Searching a database with the set **college students AND behavior** would retrieve records only if both words appear. A record about the economic status or religious beliefs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

**(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, perhaps not at all.