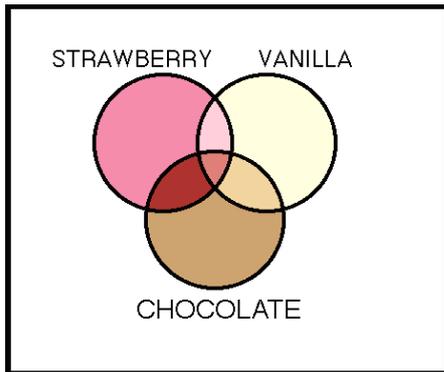# SEARCHING USING BOOLEAN LOGIC

Boolean logic uses the terms **AND**, **OR** and **NOT** to combine concepts. Ithaca College Library in the US uses ice cream to illustrate how Boolean operators work*…

In database searching **OR** expands a search by broadening the set. It is often used to combine synonyms or like concepts.
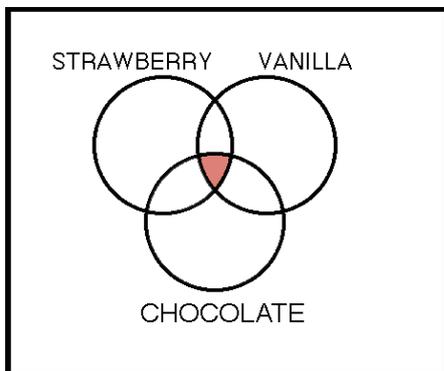

Strawberry OR chocolate OR vanilla = an ice cream lover with global tastes

e.g. A textword search for information about teenagers should include the words most commonly used:
adolescents OR adolescence OR teens OR teenagers OR young adults

In database searching **AND** narrows a search. It is often used for linking together different concepts.

Strawberry AND chocolate AND vanilla = an ice cream lover who only eats ice cream which combines 3 flavours at the same time (i.e. Neopolitan ripple)

e.g. The following statement
students AND behavior
will only retrieve records in which the words 'students' and 'behavior' appear in the same document.

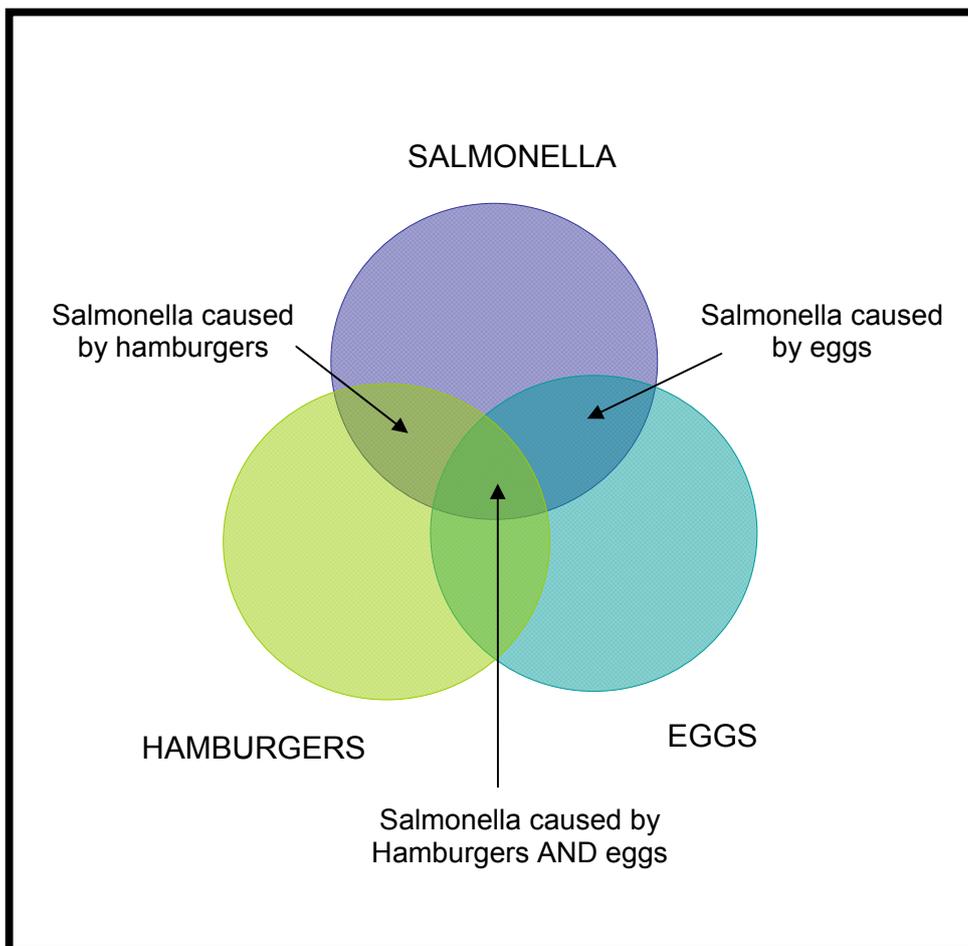In database searching, **NOT** is used to get rid of an unwanted concept.
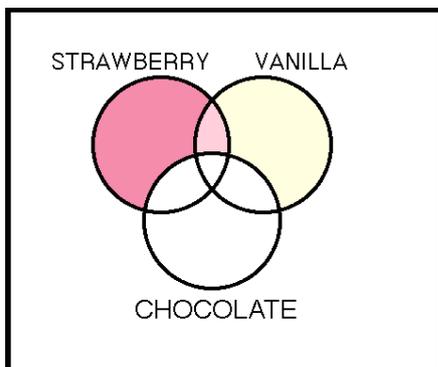
(Strawberry OR vanilla) NOT chocolate = an ice cream lover allergic to chocolate

If you were interested in information on university students but not high school students, you could search
(university students) NOT (high school)

But BEWARE! – this will exclude articles which discuss both types of students

You can combine sets in a variety of ways using combinations of Boolean operators. When writing out the sets, parentheses are important because they define the order in which the concepts are processed in the same was as brackets and parentheses are used in mathematical equations. **'AND' takes priority and is processed first - unless you use brackets to group concepts.** Look at the examples below…

SALMONELLA

Salmonella caused
by hamburgers

Salmonella caused
by eggs

HAMBURGERS

EGGS

Salmonella caused by
Hamburgers AND eggs

e.g. To find information on the incidence of salmonella food poisoning caused by hamburgers, with or without eggs:

salmonella AND hamburgers AND eggs = food poisoning caused by both

(hamburgers OR eggs) AND salmonella = food poisoning caused by either

hamburgers OR eggs AND salmonella = food poisoning caused by eggs, as well as hamburgers which have salmonella and which don't (the 'AND' is processed first).

(hamburgers AND salmonella) NOT eggs = only food poisoning caused by hamburgers, removing the confounding effect of having eggs at the same time

The intersection of the circles indicates women who have breast cancer and who also smoke:

women AND breast cancer AND smoking

To find the women who have breast cancer but who don't smoke:

(women AND breast cancer) NOT smoking

Breast Cancer
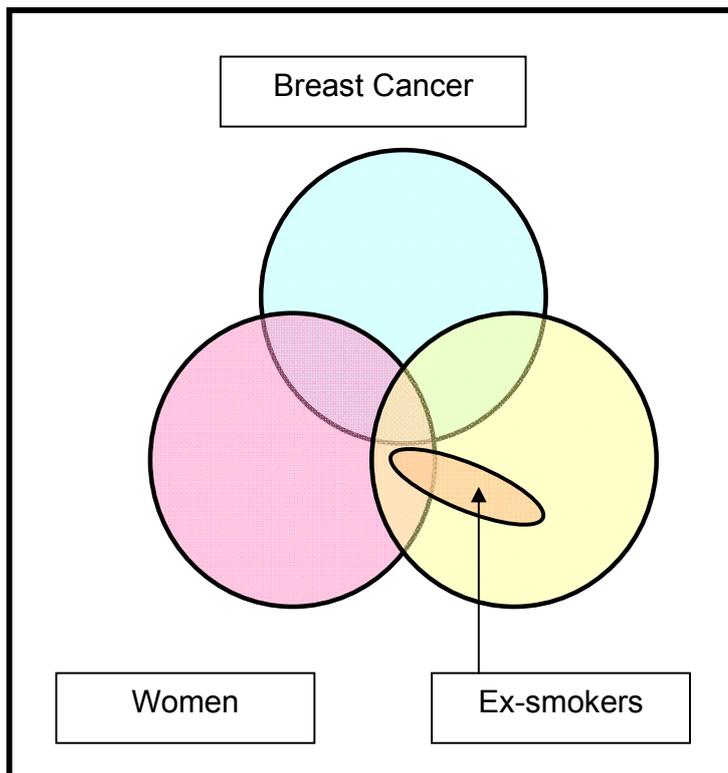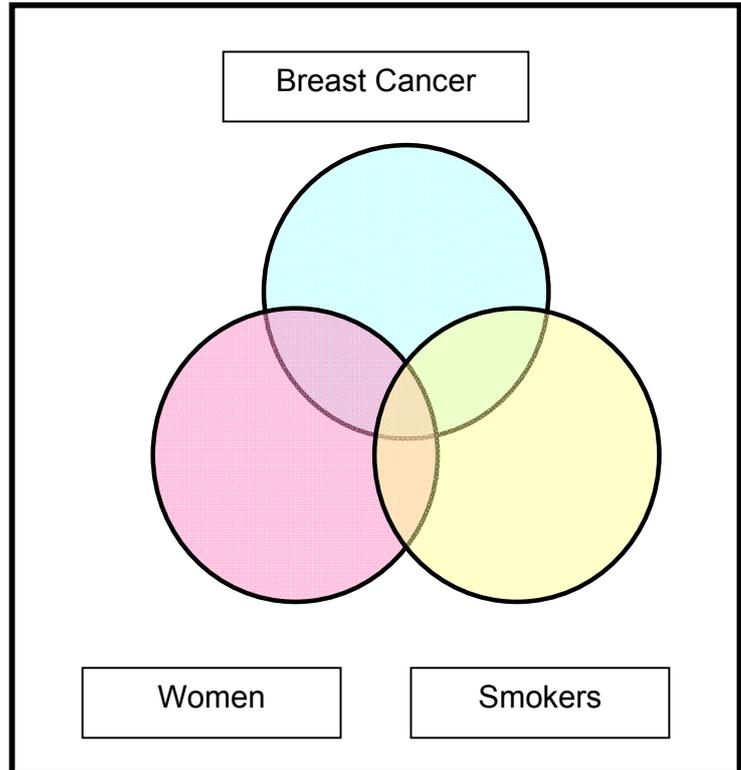
Women   Smokers

To find women who have breast cancer and who are EX-smokers:

women AND breast cancer AND Ex-smokers

And those who have breast cancer but have never smoked:

(women AND breast cancer) NOT smokers

Be careful using 'NOT' – it is very easy to exclude information which is relevant

Breast Cancer

Women   Ex-smokers

* Reference: Henderson J, Strickland J (Ithaca College Library), accessed at: http://www.ithacalibrary.com/sp/subjects/boolean on May 21, 2012