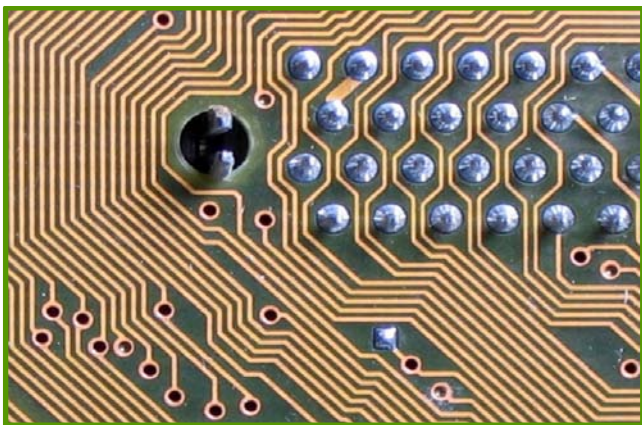


# Thinking Like a Computer

Computers are amazing things and they are improving all the time. However, they are not yet at the stage where they can successfully think like people. Therefore, if we have to use computers to look for information, we need to learn to think like a computer.

## How do computers think?

When computers are searching for information online (such as in the QUT catalogue, on a database or on the Internet) they do not think about words or the meaning of words. They search for sequences of characters.



Therefore, if you put a word like **apple** in the search box, it whizzes through thousands, even millions, of records looking for **a-p-p-l-e**. Any time it finds that sequence of characters, it will produce the record in which it found it. Likewise, if you misspell the word as **appel**, it will look for **a-p-p-e-l**, without any consideration that this is not a real word and you may have made a mistake. It just finds the sequence of characters it has been given.

*Computers don't think in words or the meanings of words, they just search for sequences of characters*

## How to think like a computer

There are many strategies that have been devised to help you find information more efficiently using a computer. These strategies work in the QUT catalogue and many of our databases (although sometimes there may be variations between databases). Also, these strategies generally work on the Internet.

### Looking for variations on a root word.

If we put a word like **social** into a search box, the computer will find everything with that sequence of characters in it. However, it will not look for all the variations of that word such as socialise, sociable, socialisation, socialising. The way to get a computer to search for these variations is called **truncation**.

Truncation is used by putting the root word into the search box followed by an asterisk \*. This asks the computer to look for this sequence of characters plus any number of characters after that sequence.

For example, if you put nation\* into the search box, the computer will not only give you the results for the sequence of characters nation but also for nations, national, nationhood, nationalisation, etc.

## Terms:

**Truncation:** An asterisk \* which asks the computer to look for a sequence of characters and any number of characters after that.

**Wildcard:** A question mark ? which asks the computer to look for a sequence of characters and replace the wildcard with any one character.

**Phrasing:** Asking the computer to regard a phrase as one sequence of characters by putting inverted commas " " around the phrase.

**Boolean Operators:** Words used to combine searches in different ways

**OR** asks the computer to find resources containing ANY of the given terms (used for similar terms)

**AND** asks the computer to find resources containing ALL of the given terms (used for different terms)

**NOT** asks the computer to eliminate any resources containing a given term.

## Looking for variations in spelling

Many words in Australia have a different spelling from the same words in the United States of America.

Some of these words include encyclopaedia (encyclopedia), organise (organize) and neighbour (neighbor).

For those words where there is only one letter difference, you can use a wildcard, which is a question mark? into the word. A wild card says to the computer to look for a certain sequence of characters but it can have any character in the place of the?

Therefore, for those words which Americans spell with a z and Australians spell with an s, a question mark replacing the letter will bring up results using both spelling variations. For example, put organi?ation into the search box and the computer will return all of the records which contain this word using either spelling variation.

This is useful, as well, when words have unusual plurals such as woman and women. By putting wom?n into the search box, both words will be found by the computer.

For those words where the difference in spelling involves a different number of letters, you can use the

truncation symbol in the middle of the word. (This is because, unlike the question mark which only replaces one character, this symbol replaces any number of characters).

Thus, if you put p\*diatrician into the search box, the computer will find everything that is paediatrician (13 letters) or pediatrician (12 letters).

## Looking for phrases

When searching for a particular phrase, if you just put each word into the search box, the computer will look for each word separately. Thus, if you put in **Commonwealth of Australia**, the computer will look for commonwealth, of and Australia not matter where each of these words appear in the documents.



However, often you want only those results which have that combination of words as a phrase. The solution is to put them in inverted commas “ ”. This tells the computer that it is read this group of words as one sequence of characters.

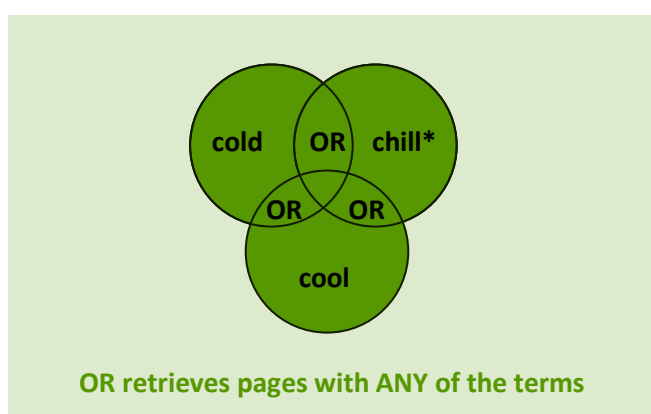
Thus, if you want the computer to search for the phrase, you put “Commonwealth of Australia” inside inverted commas into the search box.

## Combining Searches - Boolean Operators

Computers use mathematical terms called Boolean Operators to search for combinations of terms. These are the basis of computer logic. (Boolean Operators were developed by a mathematician called George Boole, hence the name).

### Looking for terms similar to each other – the Boolean Operator OR

If you are searching for a particular term (for example, the term ‘cold’) the computer will only search for that particular sequence of characters **c-o-l-d**. However, not all writers may have used that particular term when they were writing about that concept. They could have used other words such as cool or chill.

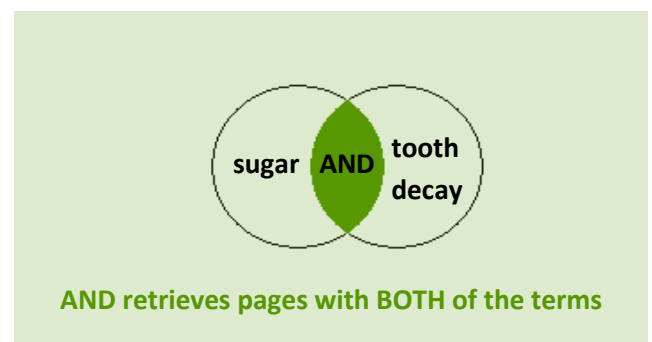


The Boolean Operator **OR** enables you to get the computer to search for all the different variations of the concept at once. By writing (cold OR chill\* OR

cool) you are asking the computer to find resources that have ANY of these terms.

### Looking for terms different from each other – the Boolean Operator AND

Often, when researching for an assignment, you need to find resources that talk about the relationship between two different concepts (for example, sugar and tooth decay).



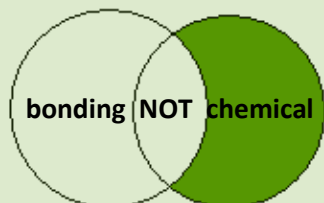
If you ask the computer to search for these terms using the Boolean Operator **AND** (sugar AND “tooth decay”) you are asking it to find all the resources that have the character sequence **s-u-g-a-r** and all the resources that have the character sequence **t-o-o-t-h---d-e-c-a-y**.

However, the computer will only give you those resources that have BOTH of these terms. This way, you will find resources that are likely to be most useful for your assignment.

### Excluding terms that are not appropriate – the Boolean Operator NOT

Sometimes, terms may have more than one meaning and asking the computer to search for that term means you end up with a lot of information that is totally inappropriate for your research.

One example of this is in psychology where the term ‘bonding’ is related to attachment between people or humans. However, this term is also found in



NOT retrieves pages with search terms  
and NOT with the excluded term

chemistry where this term refers to molecules that stick together. How can we get around this? We can use the Boolean Operator **NOT**.

If you put bond NOT chemical into the search box, you are asking the computer to look for all resources that have the sequence of characters **b-o-n-d-i-n-g** but then to eliminate any resources that also have the sequence of characters **c-h-e-m-i-c-a-l**. This strategy usually enables you to find resources appropriate for your particular meaning of a term.

### Combining Boolean Operators – Nesting

It is possible to combine Boolean Operators to refine your search even further.

If we go back to the example of sugar and tooth decay, we know that another term for tooth decay is caries. Some writers may have used this term instead. Therefore we can combine the use of OR and AND to nest similar terms and then combine the different concepts. In the search box we could write sugar AND (“tooth decay” OR caries).

In this we are asking the computer to search for all resources with the character sequence **s-u-g-a-r**, and all the resources that contain EITHER **“t-o-o-t-h---d-e-c-a-y”** OR **c-a-r-i-e-s**. Then it is to give us any resources that have sugar AND caries or sugar AND tooth decay or sugar AND caries AND tooth decay.

There are lots of other strategies that are available to help you refine your computer searches. However, these are the most common ones and the most useful for your study.

### PHOTO REFERENCES

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