

TUTORIAL 2: Argument mapping

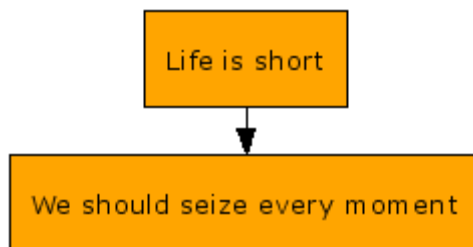
An (simple) argument is a set of one or more premise with a conclusion. A *complex argument* is a set of arguments with either overlapping premises or conclusions (or both). Complex arguments are very common because many issues and debates are complicated and involve extended reasoning. To understand complex arguments, we need to analyze the logical structure of the reasoning involved. Drawing a diagram can be very helpful.

7.1 Argument maps

An *argument map* is a diagram that captures the logical structure of a simple or complex argument. In the simplest possible case, we have a single premise supporting a single conclusion. Consider this argument :

Life is short, and so we should seize every moment.

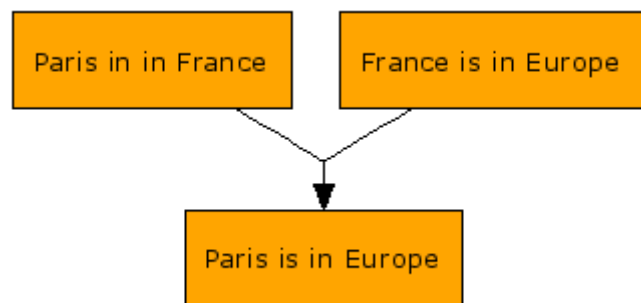
This can be represented in an argument map as follows:



Let us now look at another example:

Paris in in France, and France is in Europe. So obviously Paris is in Europe.

Here is the corresponding argument map:

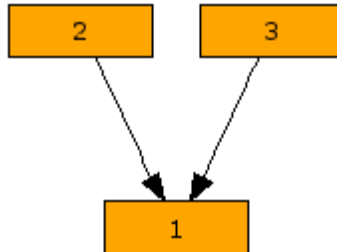


Note that the two premises are connected together before linking to the conclusion. This merging of the links indicate that the two premises are *co-premises* which work together in a single argument to support the conclusion. In other words, they do not provide *independent reasons* for accepting the conclusion. Without one of the premises, the other premise would fail to support the conclusion.

This should be contrasted with the following example where the premises are not co-premises. They provide independent reasons for supporting the conclusion:

[1] Smoking is unhealthy, since [2] it can cause cancer. Furthermore, [3] it also increases the chance of heart attacks and strokes.

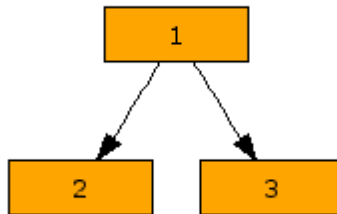
Instead of writing the premises and the conclusion in full in the argument map, we can label them and write down their numbers instead:



This diagram tells us that [2] and [3] are **independent** reasons supporting [1]. In other words, without [2], [3] would still support [1], and without [3], [2] would still support [1]. (Although the argument is stronger with both premises.)

Finally, it is also possible to have a single reason giving rise to multiple conclusions :

[1] Gold is a metal. [2] So it conducts electricity. [3] It also conducts heat.



7.2 More complicated examples

Now that we know the basics of argument maps, we can combine the templates we learn above to represent more complicated arguments, by following this procedure:

1. Identify the most important or main conclusion(s) of the argument.
2. Identify the premises used to support the conclusion(s). These are the premises of the main argument.
3. If additional arguments have been given to support any of these premises, identify the premises of these additional arguments as well, and repeat this procedure.
4. Label the premises and conclusions using numerals or letters.
5. Write down the labels in a tree structure and draw arrows leading from sets of premises to the conclusions they support.

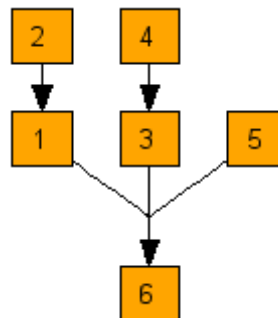
Let us try this out on this argument:

Po cannot come to the party because her scooter is broken. Dipsy also cannot come because he has to pick up his new hat. I did not invite the other teletubbies, so no teletubby will come up to the party.

We now label and reformulate the premises and the conclusions:

1. Po cannot come to the party.
2. Po's scooter is broken.
3. Dipsy cannot come to the party.
4. Dipsy has to pick up his new hat.
5. I did not invite the other teletubbies.
6. [Conclusion] No teletubby will come up to the party.

We can then draw the argument map like this:



This is an example of what we might call a *multi-layered* complex argument, where an intermediate conclusion is used as a premise in another argument. So [1] and [3] are the intermediate conclusions, which together with [5] lead to the main conclusion [6]. This complex argument is therefore made up of three overlapping simple arguments in total. Of course, in this particular case you can understand the argument perfectly well without using this diagram. But with more complicated arguments, a picture can be an indispensable aid.

7.3 Exercises

Draw argument maps for the following arguments:

Question 1 -

[1] This computer can think. So [2] it is conscious. Since [3] we should not kill any conscious beings, [4] we should not switch it off.

Question 2 -

[1. Many people think that having a dark tan is attractive.] [2. But the fact is that too much exposure to the sun is very unhealthy.] [3. It has been shown that sunlight can cause premature aging of the skin.] [4. Ultraviolet rays in the sun might also trigger off skin cancer.]

Question 3 -

[1. If Lala is here, then Po should be here as well.] [2. It follows that if Po is not here, Lala is also absent,] and indeed [3. Po is not here.] So most likely [4. Lala is not around.]

Question 4 -

[1. Marriage is becoming unfashionable.] [2. Divorce rate is at an all time high], and [3. cohabitation is increasingly presented in a positive manner in the media]. [4. Movies are full of characters who live together and unwilling to commit to a lifelong partnership]. [5. Even newspaper columnists recommend people to live together for an extended period before marriage in order to test their compatibility.]

Question 5 -

[1. All university students should study critical thinking.] After all, [2. critical thinking is necessary for surviving in the new economy] as [3. we need to adapt to rapid changes, and make critical use of information in making decisions.] Also, [4. critical thinking can help us reflect on our values and purposes in life.] Finally, [5. critical thinking helps us improve our study skills.]

Question 6 -

Now extract the premises and conclusions yourself: "The Bible says that life was created by God. The Bible is the word of God so what it says must be true. So the theory of evolution is false, even though many people accept the theory. Besides, the theory says that monkeys and humans have the same ancestors, but this cannot be since we are so different."