1.5. Chain Arguments and Argument Maps

1. Chain Arguments. Combo sentences provide the stepping stone necessary to understand more complex arguments such as the following.

> Jack is a short-haired cat, so he's not a Birman. But he can't be a tabby, since he has seal-point markings. Therefore Jack is either a Siamese or a Burmese.

The sentence "Jack is either a Siamese or a Burmese" is marked as the conclusion, both by its location at the end of the passage, and by the word "therefore". But it would be a mistake to think the standard form of this argument is as follows.

☠ ?? Standard Form ?? ☠

1. Jack is a short-haired cat, so he's not a Birman.
2. But he can't be a tabby, since he has seal-point markings.

∴ 3. Jack is either a Siamese or a Burmese.

That's because neither of the other two sentences are *simply* premises. The conclusion marker "so" in the middle of the first sentence makes clear that it is a *combo sentence* – a miniature argument with its own premise and conclusion.

(1) Jack is a short-hairded cat, **so** (2) he's not a Birman.

↖ *Premise* ↖ *Conclusion*

The standard form of this combo sentence is as follows.

1. Jack is a short-haired cat

∴ 2. He's not a Birman.

The second sentence is also a combo sentence, with premise marker "since" and the conclusion-marking modal "can't".

(3) He can't be a tabby, **since** (4) he has seal-point markings.

Conclusion *Premise*

It looks like this in standard form.

4. He [Jack] has seal-point markings

∴ 3. He [is]n't a tabby

What we have here is **an argument with two smaller arguments as parts**. The true standard form of the whole argument is as follows.

Standard Form

1. Jack is a short-haired cat

∴ 2. He's not a Birman

4. He [Jack] has seal-point markings

∴ 3. He [is]n't a tabby

∴ 5. Jack is either a Siamese or a Burmese.

Sentences (1) and (4) are clearly premises, and the last sentence is clearly a conclusion. But Sentences (2) and (3) are hybrid sentences. Each is a *conclusion*, following from a previous sentence; each also acts as a *premise* in support of the final sentence. We call such a hybrid sentence a **sub-conclusion**.[1]

Likewise a little argument whose conclusion is a sub-conclusion, will be called a **sub-argument**. So the argument from (1) to (2) is a sub-argument; and the argument from (4) to (3) is as well.

[1] In mathematics, a sub-conclusion is sometimes called a "**lemma**".

The argument as a whole is therefore a **chain argument**, with two sub-arguments as parts.

> **Chain argument: an argument having two or more smaller arguments as parts.**

We say the final conclusion of the argument is the **main conclusion** of the whole argument. The main conclusion is the only sentence in the chain not supporting some further conclusion.

2. Argument Maps. With earlier, non-chain-type arguments, stating the standard form was a simple affair: we state each premise and the conclusion in a single list. With the advent of chain arguments, however, this format threatens to become confusingly cluttered. Our earlier example was still manageable in list format, since it had only two sub-arguments, running in parallel.

Standard Form

1. Jack is a short-haired cat
∴ 2. He's not a Birman

4. He [Jack] has seal-point markings
∴ 3. He [is]n't a tabby

∴ 5. Jack is either a Siamese or a Burmese.

But with numerous sub-arguments such a depiction becomes eye-boggling. For this reason we introduce a revised format for representing the standard form of complex arguments, called an **argument map**.

By way of illustration, we build an argument map for our previous chain argument.

The **first step** in making an argument map is **numbering every premise and conclusion** (including *sub-conclusions* – conclusions that act as premises for a further conclusion). And since a combo sentence has both a

premise and a conclusion, the two parts of a combo sentence get *different* numbers.

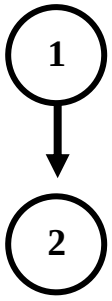
Our chain argument example would be numbered like so.

> **(1)** Jack is a short-haired cat, so **(2)** he's not a Birman. But **(3)** he can't be a tabby, since **(4)** he has seal-point markings. Therefore **(5)** Jack is either a Siamese or a Burmese.

We then show that one sentence is supporting another sentence by drawing a downward arrow from premise number to conclusion number.

1. Premise

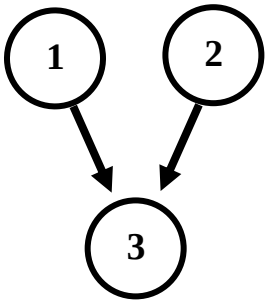
∴ 2. Conclusion



If more than one premise is supporting the same conclusion, we draw an arrow from such premise number to the conclusion number.

1. Premise
2. Premise

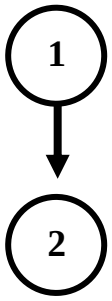
∴ 3. Conclusion



In the chain argument we've been looking at, Sentence (1) is a premise in support of Sentence (2).

1. Jack is a short-haired cat

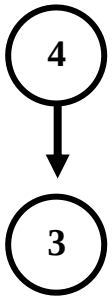
∴ 2. He's not a Birman.



And Sentence (4) is a premise in support of Sentence (3).

4. He has seal-point markings

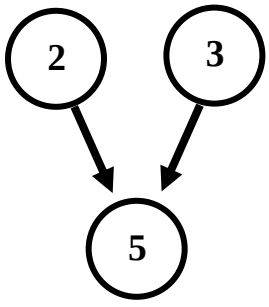
∴ 3. He isn't a tabby



Sub-conclusions (2) and (3) support the main conclusion, sentence (5).

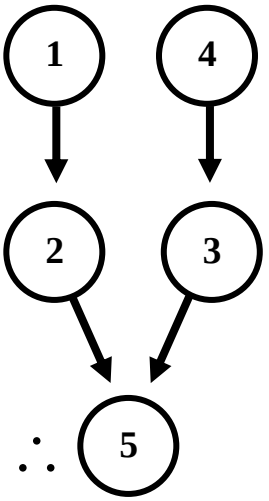
2. He's not a Birman.
3. He isn't a tabby.

∴ 5. Jack is either a Siamese or a Burmese.



Putting these links together yields the argument map for this chain argument.

> **(1)** Jack is a short-haired cat, so **(2)** he's not a Birman. But **(3)** he can't be a tabby, since **(4)** he has seal-point markings. Therefore **(5)** Jack is either a Siamese or a Burmese.



We reserve the conclusion symbol "∴" for the **main** conclusion.

Two closing notes: **first**, remember that an argument map is just a shorthand statement of **standard form** (for a chain argument). So material left out of standard form (e.g. markers and questions) is left out of the argument diagram.

Second, note that all we're really doing here is using premise and conclusion **markers** (and similar clues, such as likely places) to show each premise-to-conclusion move (with a downward arrow). In this example, (2) was marked as a (sub-) conclusion by "so"; (4) was marked as a premise for (3) by "since"; and main conclusion (5) was marked by "therefore" (and a likely place for a main conclusion). While we will add a bit more to our argument mapping method, these familiar clues are already sufficient to carve out most of the argument structure.

Summary: Argument Maps

- **Number each premise and conclusion**. (Note: **the two parts a combo sentence receive different numbers**.)
- **When one sentence supports a second sentence** (as shown by markers), draw a **downward arrow from premise number to conclusion number**. (If two or more sentences act as premises for the same conclusion, draw an arrow from each premise number to the conclusion number.)
- Mark the **main conclusion** of the chain argument with the **conclusion symbol**, "∴".