ARGUMENTS

The unit of reasoning is called an argument. Another term for an argument is an inference. There are two types of reasoning: justificatory and explanatory. Justificatory reasoning is used when we want to prove a conclusion, or show that it is likely to be true. Explanatory reasoning is used to explain why something is true. In this course we are concerned more with justificatory reasoning.

Official definition: An argument is a set of statements, some of which are offered in support of another. The statement one is attempting to support is called the conclusion. The statement(s) offered in support of the conclusion are called the premise(s). Premises are offered as reasons or evidence to take the conclusion to be true.

What is a statement? A statement is a sentence that has a truth value, that is, it is either true or false. The fact that it has a truth value does not imply that we know what that truth value is. Not all sentences have truth values. Remember the grammatical classification of four types of sentences – declarative, interrogative, imperative, and exclamatory. Which types do not typically have truth values?

Normally we make statements in the form of declarative sentences: “God exists.” “The Earth has one natural satellite.” “2 + 2 = 7.” “It certainly is warm today.” It is possible to express a statement in other forms of sentence. In particular, we sometimes express statements in the form of questions, and imperatives can also be reworded as statements. What do we call questions which are used to make statements?

The point of justificatory reasoning is to demonstrate the truth of a conclusion, by offering one or more premises in its support. Here is an argument, presented in a standard format, with the premises given above the line, and the conclusion below the line:

1. Everything that exists has a cause.
2. The universe exists.
3. Therefore, the universe has a cause.

The above argument has two premises. Not all arguments have two premises. Here is another argument, with only one premise:

1. In a recent study, 66% of the people who took medication X had fewer colds.
2. Therefore, over half of the population in general who take medication X will have fewer colds.

Notice that the definition of an argument says only that one must offer some statement(s) in support of the conclusion. It does not say how many must be offered. The only restriction is that the number of statements must be finite.

When one makes a statement without offering any supporting reason, one is not making an argument. A set of statements in which none are offered to support another therefore do not constitute an argument. The key to an argument (or inference) is offering at least one statement (premise) to accept another statement as true.

Now, let’s see how much of this you understood. Answer the following questions:
1. How many statements, at a minimum, must an argument have?
2. How many premises must there be in an argument?
3. Why does the definition say that the premises are “offered” in support of the conclusion, rather than that the premises in fact support the conclusion?
Arguments can become very complex. As we shall see, one can reason serially, using a conclusion as support for a further conclusion. The distinction between premise and conclusion is a functional distinction: whether a statement is a premise or conclusion in an argument depends solely on whether it is used to support another statement (thereby becoming a premise) or whether one is offering statements to support it (thereby becoming a conclusion). Thus the same statement may function as a premise in one argument and a conclusion in another. Consider this example:

1. Everything that exists has a cause.
2. The universe exists.
3. Therefore, the universe has a cause.
4. The cause of the universe could only be God.
5. Therefore, God exists.
6. Therefore, God must have a cause. (By 1 and 5.)

Question: how many arguments are there here? We identify and individuate arguments (or inferences) by the conclusion. Each inference to a conclusion counts as a separate argument. (We shall see when we evaluate arguments why this is so.) So the answer is that there are three arguments in the above example, arranged serially. So look at statements 3 and 5. Are they conclusions or premises or both? Answer: it depends on which inference you are talking about. In the first inference, from statements 1 to 3, statements 1 and 2 are the premises, and statement 3 is the conclusion. In the second inference, from statements 3 to 5, statements 3 and 4 are premises, and statement 5 is the conclusion. Similarly, statements 5 and 1 are premises in the third inference, where statement 6 is the conclusion. Statements 3 and 5 are also called sub-conclusions, and statement 6 the final conclusion of the argument.

DEDUCTIVE AND INDUCTIVE ARGUMENTS

There are two types of justificatory reasoning: deductive and inductive. They differ in terms of their evidence and purpose. Deductive arguments are those in which one intends to guarantee the truth of the conclusion. When one argues deductively, one offers premises or evidence that one takes to provide sufficient justification to show that a conclusion must be true. Here are some common forms of deductive reasoning:

1. All humans are mortal.
2. Socrates is human.
3. Therefore, Socrates is mortal.
4. If Jill owns a Porsche, then she owns a car.
5. Jill owns a Porsche.
6. Therefore, Jill owns a car.

In inductive reasoning one offers premises or evidence to provide some support for the conclusion. The best one can do in inductive reasoning is to demonstrate that a conclusion is probable or likely to be true. This is because the premises offer empirical evidence, or evidence derived from experience or observations. In inductive arguments, the premises make claims about observed cases, and draw conclusions about unobserved cases, as in the following:

1. All swans observed so far are white.
2. Therefore, all swans are white.
1. In the past, the sun has risen every day.
2. In the future, the sun will rise every day.

Because deductive and inductive arguments have different purposes (related to the different types of evidence they offer), there are different methods for evaluating them. Put briefly, deductive arguments can be evaluated for validity and soundness. By contrast, inductive arguments are evaluated in terms of their degree of strength. Because most philosophical arguments are deductive, we shall focus on the concepts of validity and soundness.
IDENTIFYING ARGUMENTS: INFERENCE INDICATORS

Inference indicators are words or phrases used to indicate that someone is making an inference (an argument). Because inferences have two parts – premises and conclusions – there are two types of indicators. In both cases the indicator precedes the statement it indicates as a premise or a conclusion. For example, this sentence has two statements, and one inference indicator:

“Because the final counts for 30% of your grade, you should study carefully for it.”

The indicator here is the word ‘Because’, which is a premise indicator. This word indicates that the first statement ‘the final counts for 30% of your grade’ is used as a premise to support the statement ‘you should study carefully for it.’ The following sentence makes the same argument, but uses a conclusion indicator instead of a premise indicator:

“The final counts for 30% of your grade, so you should study carefully for it.”

The same statement functions as a premise supporting the same conclusion.

Here are some common premise indicators:

- Because…
- since…(time exception)
- for…(preposition exception)
- as shown by…
- as indicated by…
- follows from…
- assuming that…
- for the reasons that…
- in view of the fact that…
- may be inferred /derived from…

Here are the most common conclusion Indicators:

- Consequently…
- Therefore…
- So…
- I conclude that…
- proves that…
- hence…
- Which shows that…
- must… (some exceptions)
- implies that…
- Entails that…
- accordingly…
- allows us to infer that…
- Thus… (exceptions)
- demonstrates that…
- it follows that…

These are not the only ways to indicate premises and conclusions, but these are the most common. You need to think about the meaning of the phrases preceding statements that might be construed as reasons or conclusions.

Another point to keep in mind when identifying arguments is that premises and conclusions can be stated in any order. The brief argument given above can also be stated with the conclusion given before the premise: “You should study carefully for the final, since it counts for 30% of your grade.” So when you are reading for arguments, you have to identify the premises and conclusions in terms of which statements offer support, and which statements are being supported.

Some reasoning contains NO inference indicators, e.g.: “It’s going to rain. You should take an umbrella.” To decide whether discourse contains reasoning, we go through this procedure:

1) we look for inference indicators. If we find them, we must analyze the reasoning following the inference indicators (even if it is not good reasoning).

2) if there are no inference indicators, we follow the Principle of Charity. The Principle of Charity says that you must interpret the passage so as to make it the strongest reasoning possible. This means: If a passage has no inference indicators and there is no way to interpret it as containing good reasoning, we must call it nonreasoning. If the passage has inference indicators but there is more than one possible interpretation, we must choose the interpretation that results in the strongest reasoning. Why do we do this?

Remember: the argument is in the speaker’s or writer’s intention. If someone is offering premises to support a conclusion, we must call it an argument, even if the reasoning is bad reasoning. Why do we do this? Once you understand this point, you will be on the way to understanding the nature of argument.
Argument identification exercises

Decide which of the following passages contain arguments. Be able to defend your position. For those that do, use inference indicators to determine which statements are premises (reasons) and which are conclusions. In some cases you may need to insert inference indicators where they are reasonable. You also may need to supply an implicit conclusion (one that is logically implied but not actually stated). Do your best.

1. John would help us move, but he has a bad back. So we are going to need to find someone else.

2. Men are better at lifting heavy furniture than women.

3. She must have money. Just look at the clothes she’s wearing.

4. The nicotine in tobacco is addictive like heroin. Therefore, tobacco should be treated as a drug.

5. Using threats of foreign trade sanctions as a device to punish nations that violate human rights is a bad policy, for it does not change the behavior of the violators and only hurts our jobs and trade.

6. If Jones were the thief, he would have skipped town. But he stayed around. Can you see what that says?

7. Everybody has needs. You don’t fill mine. So I’m splittin’.

8. Don’t chew ice. You may crack a tooth.

9. She’s been married since last June.

10. Heat the oil in a frying pan with a cover. When hot, add the onion, ginger, garlic, and salt and pepper to taste, and stir fry for 1 minute. Add the cauliflower and turn the pieces in the oil in a gentle stir fry for 2 minutes. Add vegetable broth, butter, and milk, and continue to stir fry gently for 2 minutes, until the butter has melted and the liquid has coated the vegetable and is boiling vigorously.

11. Smoking endangers nonsmokers too. It should be banned from buildings open to the public.

12. The houses were covered with vines bearing bell-shaped flowers playing coloraturas. The guitars inside of the houses or on the doorsteps took up the color chromatics and emitted sounds which evoked the flavor of guava, papaya, cactus figs, anise, saffron, and red pepper.

13. Neutron: a neutral uncharged particle of atomic weight approximately unity…. Closely packed neutrons and protons compose the nuclei of all atoms. The neutron is slightly heavier than the proton; in the free state it decays, yielding a proton, with a half life of about 12 minutes. It has some magnetic properties.
EVALUATING DEDUCTIVE ARGUMENTS: VALIDITY AND SOUNDNESS

When we evaluate DEDUCTIVE arguments, we are trying to determine whether the premises succeed in proving the truth of the conclusion. (For inductive arguments, the premises can supply weak to strong support, but cannot conclusively prove a conclusion.) A successful deductive argument is called a sound argument. To be sound, a deductive argument must pass two tests: the validity test and the truth test. These tests are independent of each other: an argument can pass both, or fail both, or pass one but not the other.

1. **Deductive Validity**: has to do with the logical correctness or form of the argument, with the degree of support the premises give the conclusion. In testing for validity, we have to decide whether the conclusion follows logically from the premises.

2. **Truth**: has to do with the actual truth value of the premises (NOTE: only the premises, not the conclusion). In particular, we must decide whether all the premises of the argument are in fact true (to the best of our ability).

If an argument flunks either test, then it is UNSOUND:

\[
\text{SOUNDNESS} = \text{DEDUCTIVE VALIDITY} + \text{TRUTH (of all the premises)}
\]

**Terminology**: An argument is not true or false; it is valid or invalid. Individual statements in the argument (premises and conclusion) are true or false, but they are not valid or invalid. The statements are not sound or unsound, only a complete argument is sound or unsound.

**Validity**: A deductively valid argument is one in which, if the premises were true, the conclusion must be true. (Note that this does not say that the premises are in fact true.) In other words, if in evaluating an argument, we decide that even if the premises were true the conclusion could still be false, then we have decided that the argument is invalid.

Here is a deductively valid argument:

1. If Shirley is a cat, then Shirley is a mammal.
2. Shirley is a cat.
3. Therefore, Shirley is a mammal.

Now does the validity of the argument depend on whether premises 1 and 2 are both true? What do you need to know to decide whether the argument is valid? Sound?


1. All elected politicians are liars.
2. Clarence Thomas is an elected politician.
3. Therefore, Clarence Thomas is a liar.

What about this argument: is it valid? is it sound?

1. Some roses are red.
2. Some violets are blue.
3. Therefore, interest rates will not rise this year.

In reading philosophy, when you encounter an argument, you should ask these questions:

Is it a valid argument; that is, if the premises were true, would the conclusion have to be true?

Are the premises in fact true (to the best of my knowledge)? If I think the conclusion is false, can I say which of the premises are false or explain why the argument is invalid? Can I defend my evaluation?
Extra Credit Homework

Evaluate the following deductive arguments according to the validity and truth tests. Say whether they are valid or invalid, and sound or unsound. You may defend your answers. If you cannot decide on soundness, explain why. (One point for each correct answer: all parts of the answer and defense must be correct.)

Argument 1:

1. Anyone who is in San Bernardino is in California.
2. I (the student now doing this homework) am currently in California.
3. Therefore, I (the student now doing this homework) am currently in San Bernardino.

_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________

Argument 2:

1. All CSUSB professors are under the age of 29.
2. Dr. Buroker is a CSUSB professor.
3. Therefore, Dr. Buroker is under the age of 29.

_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________

Argument 3:

1. George W. Bush is currently President of the United States.
2. Therefore, water is composed of two molecules of hydrogen and one molecule of oxygen.

_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________
_____________________________________________________________________________