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Argument in the College (DRAFT)

The goal of CAS 105 is for you to learn to write successful argumentative essays. Argumentative essays, of course, consist of arguments. An argument, in this sense, is simply a set of statements, consisting of at least one **argument-conclusion** (hereafter, *arg-conclusion*) and at least one **premise**. The two main ways that an argument can go wrong are if its premises fail to support its arg-conclusion, or if its premises are not all true. While there is unfortunately no systematic procedure for ensuring that your premises are all true, this manual outlines a strategy for constructing cogent arguments that helps you avoid the first problem. The following explains in detail, by appeal to an extended example, how to Present, Explain, and Evaluate **(PEE)** an argument, step-by-step. An argument that is correctly PEE-ed is vastly clearer than a typical prose argument. In addition, the premises of a correctly PEE-ed argument are guaranteed to support its conclusion. Finally, by using PEE, you will have the advantage of being able to state exactly where an argument goes wrong. As a result, being able to correctly PEE arguments puts you at a significant advantage, particularly when the subject matter of the argument(s) is complex, as is often the case in college writing.

The manual is organized as follows: there is a section on Presenting Arguments, followed by a section on Explaining Arguments, and a section on Evaluating Arguments. In each section, there is a brief outline of what is involved in Presenting, Explaining, and Evaluating, respectively. Following that is a more detailed explanation of each

component as well as some extended examples to serve as illustration. Finally, we discuss some critical reading and writing skills and how PEE can help you develop them.

Presenting Arguments

To **present** an argument, do the following:

(a) Locate the conclusion of the argument and formulate it in clear, literal terms.

(b) Locate the central premises from which the conclusion is derived, and formulate them in clear, literal terms.

(c) Formulate implicit premises so as to make the argument valid.

(d) Write out the entire argument in numbered premise-conclusion form.

Locate the conclusion of the argument and formulate it in clear, literal terms.

1. What is the conclusion of an argument?

The arg-conclusion of an argument is a statement of the position being argued for or against. It is the main claim for which reasons are provided. It is distinct from an *essay conclusion*, which is typically the essay's closing section that summarizes the essay and/or makes clear the essay's contribution to its topic, and reinforces the essay's thesis.

It is also worth noting the relationship between an arg-conclusion and a thesis or a hypothesis. **The arg-conclusion is often not the thesis of the essay.** If you are PEE-ing an argument that you came up with, the arg-conclusion *of that argument* will typically be a one-sentence statement of your paper's thesis. But the arg-conclusion of an argument is often not the thesis. If you are PEE-ing an argument from a text, your thesis will often be the denial of the arg-conclusion of that author's argument. For example, if you were to

write a paper on abortion, you might want to defend the claim that abortion is not immoral. This would typically be your thesis. The thesis should be clearly displayed in the introduction section of your paper. You may wish to consider an objection or an argument for the denial of your thesis in another section of your paper. You might, for instance, consider an argument that abortion is immoral, since a person's right to life is stronger than a pregnant woman's right to decide what happens in her body. The arg-conclusion of this argument is the *denial* of your thesis.

But an argumentative essay will often contain other arguments, the conclusions of which are neither the thesis nor its denial. You might, for instance, consider an objection to the argument that abortion is immoral, since a person's right to life is stronger than a pregnant woman's right to decide what happens in her body. You might reject the claim that a person's right to life is stronger than a pregnant woman's right to decide what happens in her body. The arg-conclusion of this argument would neither be your thesis nor its denial. So arg-conclusion is distinct from thesis or hypothesis.

2. How is an Arg-Conclusion Located?

The PEE method recommends identifying the conclusion of an argument before identifying the premises. Practically, it is usually easier to identify the premises once you've identified the conclusion than the other way around. If you identify premises without a conclusion, you may be unsure which conclusion is supported by those premises. (As it turns out, any set of premises is support for *infinitely* many conclusions!) Identifying a conclusion first puts the argument analyst in the position of seeking premises for a single conclusion rather than wondering which of several

conclusions are supported by some premises he's identified. Now that we know what an arg-conclusion is, we need some idea of how to find it. Here are some tips to help you identify the arg-conclusion:

Arg-conclusion-finding tip 1:Look for arg-conclusion indicator terms

If you are PEE-ing an argument from a text, you can often find the arg-conclusion by finding conclusion-indicator terms, which typically indicate that an arg-conclusion follows. Examples of arg-conclusion-indicator words are 'therefore', 'hence', 'so', and the phrase, 'as a result'. Here is an argument for the arg-conclusion that abortion is immoral from Ernest Lepore:

> If a fetus is a person, then it has a right to life. If a fetus has a right to life, then abortion is immoral. So abortion is immoral.

Note that the arg-conclusion of the argument Lepore presents begins with a conclusion-indicator term: "So abortion is immoral." It is helpful to use conclusion-indicator terms in your essay to help the reader identify your arg-conclusion(s).

Arg-conclusion-finding tip 2: Look for an explicit statement of the arg-conclusion

The second strategy for locating an arg-conclusion involves quickly reviewing the work to find out if the author states the explicit conclusion of an argument. The author may explicitly state the conclusion of an interesting or challenging argument at any point in the work, although section beginnings and endings are places an author frequently

identifies the explicit conclusion of an argument. For example, here's an argument from the appendix of Morton White, *What is and What Ought to be Done*, p. 125: [1]

(1) Whoever takes the life of a human being does something that ought not to be done.
(2) The mother took the life of a fetus in her womb.
(3) Every living fetus in the womb of a human being is a human being.
(4) The mother took the life of a human being.
(5) The mother did something that ought not to be done.

In White's argument, the arg-conclusion is clearly and explicitly stated in the last line of his argument.

Arg-conclusion-finding tip 3:Look for the most comprehensive idea

As you skim the work or a section, look for the most comprehensive idea. The most comprehensive idea is likely to be the arg-conclusion that the entire essay or the section supports. An argument is often constructed to support a comprehensive idea using premises to support the comprehensive idea. Here are some questions to have in mind when working on identifying the arg-conclusion:

"What's the main point of this work or section?"

"What is this author arguing for?"

"What idea does everything else lead to?"

Arg-conclusion-finding tip 4: Read and re-read

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[1] A brief note about numbering may be in order. Rarely will you read a paper in which the argument is displayed using numbered sentences. However, it is useful to number the sentences in order to keep track of them when we are formulating our argument, even if the numbers do not appear in the final draft of your argumentative essay.

Often, the arg-conclusion is undetectable by a quick reading; you may need to re-read slowly and carefully. In addition, the passage may contain multiple arguments. Even a modestly complex work likely contains several arguments. The critical reader who identifies multiple arguments gains choices; she can write about the argument that is most interesting to her. It is worth noting that in many arguments, the arg-conclusion is not presented as straightforwardly as in Lepore's or White's arguments above. Consider the following argument from Judith Jarvis Thomson:

> Every person has a right to life. So the fetus has a right to life. No doubt the mother has a right to decide what shall happen in and to her body; everybody would grant that. But surely a person's right to life is stronger and more stringent than the mother's right to decide what happens in and to her body, and so outweighs it.

What are some arg-conclusions one might draw from this argument? One might be that the fetus has a right to life. Another might be that the fetus's right to life outweighs the mother's right to decide what happens in and to her body. Note that this arg-conclusion is not explicitly stated in the above passage. Another arg-conclusion one might extract from the passage is that abortion is immoral. Note that this arg-conclusion is not stated at all. It is an *implicit* arg-conclusion. Many arguments contain implicit arg-conclusions. Your ability to identify these is parasitic on your ability to extract the main idea, most comprehensive idea, or thesis of a passage or work.

Once you have formulated or located the conclusion, formulate it as a single declarative sentence in clear, literal terms. Avoid idioms, slang, metaphor, ambiguity, etc. In a good argumentative essay, the concepts and claims under discussion are difficult

enough; it is counterproductive to cloud your argument with misleading, ambiguous, or otherwise confusing language.

Locate the central premises from which the arg-conclusion is derived, and formulate them in clear, literal terms.

1. What is a premise?

The <u>premises</u> from which the conclusion is derived are the *reasons* given in support of the conclusion; that is, the reasons for thinking that the arg-conclusion is true.

If you are PEE-ing an argument you came up with, the premises should include the main reasons you would give in support of your arg-conclusion. They are what you might say to convince an interested and intelligent neutral party that the conclusion is correct. This should consist of some supporting points and some reasons to suppose that the conclusion must be correct, given those points. Similarly, if you are PEE-ing an argument from a text, the premises are the main reasons the author gives in support of the conclusion. They are often answers to the question, "Why think that's true?" For example, suppose our arg-conclusion is that it is not the case that the fetus's right to life always outweighs the pregnant woman's right to decide what happens in her body. Why might one think that's true? One might think that any case of rape grossly violates a woman's rights, so having an abortion in cases of rape is not outweighed by the fetus's right to life. We could state our argument as follows:

1. Rape is a gross violation of a woman's rights.

2. Having an abortion in cases of rape is not outweighed by the fetus's right to life.
3. So, it's not the case that the fetus's right to life always outweighs the pregnant woman's right to decide what happens in her body.

Line (3) is our arg-conclusion, and (1) and (2) are the premises. Formulate the premises as succinct declarative sentences. Remember to avoid wordiness or confusing terminology.

2. How Are Premises Located?

a. Critical Reading Skill: "Working Backward"

The critical reading skill "working backward" is useful for identifying premises. Once you've identified the arg-conclusion, you need to identify the premises that support the arg-conclusion. Some premises will be in the work you're reading, others will not. Therefore, a critical reading skill is "working backward" from the arg-conclusion to identify the premises for the arg-conclusion. While we read most fiction and most casual writing from beginning to end, this habit does not help analyze argumentative essays. In many disciplines, authors do not list premises in order as White does in the above example. Considerations of style, readership preference, and disciplinary conventions result in a polished essay that the reader must analyze carefully in order to identify the premises of an argument.

After you've identified an arg-conclusion you may need to use other strategies to identify the premises. You may need to re-read the work several times, re-read some sections more than others, and re-read sections in an order besides that in which they are published in order to identify premises.

Here are some tips for working backward. One, based on your previous reading, re-read sections you think are most relevant to the arg-conclusion you've identified. Two, look for section summaries, tables, graphs, lists, and formal arguments. These are places where authors often list important concepts related to the argument and its premises. Three, as you identify statements that could be premises, ask yourself: is this statement a

reason for thinking that the arg-conclusion is true? If you think it is, make a note beside the text, underline it, or add it to your notes for your essay. That statement is then a candidate for the premises of the argument you extract. When you have noticed some statements that may be premises, you are ready to present those premises with a conclusion in a valid argument, as described above.

b. Critical Reading Skill: Identifying Premises

The argument's premises are the reasons for the truth of the arg-conclusion. Any argument that you will encounter in an argumentative essay contains premises for its arg-conclusion. So, if you are analyzing an essay and it does not contain premises for a conclusion, it is not an argumentative essay. After you read something written on your topic and identify its arg-conclusion, you need to ask: what in this work gives reasons for the truth of the conclusion?

Here are hints to help you identify premises:

*Premise-finding tip 1: Look for common English premise-indicator terms: **because, since, given that, and for.***

Premise-indicator terms help the reader identify <u>explicit</u> premises. But beware: not all premises items are marked by premise-indicators. Premises that are not explicitly marked by a premise-indicator term are harder to identify than marked premises. Note, too, that it may be helpful to include premise indicator terms in your essay to help your reader identify your premises.

Premise-finding tip 2: Be aware of implicit premises

Premises not marked by premise-indicators are <u>implicit</u> premises. Implicit premises are those parts of the argument that are left partially or entirely unstated. (Implicit premises are discussed further in the section on **Formulating Implicit Premises to Make an Argument Valid**.) Authors often assume their readers possess background knowledge and familiarity with the kinds of arguments commonly offered in

their field and, as a result, often do not explicitly state all of their premises. Writers investigating a topic with which they are unfamiliar may have difficulty identifying implicit premises. An instructor or reference librarian can often help you find sources of background information that experienced writers assume their readers possess.

Here are some questions to have in mind when working on identifying premises:

- What might support this arg-conclusion?

- Are there combined statements or concepts in the arg-conclusion that are defended or explained individually in other parts of the work?

- Does the author explicitly identify 'evidence,' 'reasons,' 'support,' or 'warrants,' in the text? (These terms also often indicate premises.)

Finally, it is important to note that the premises may come before or after the conclusion. In the argument against abortion presented by Thomson, note that the premises precede the conclusion:

Every person has a right to life. So the fetus has a right to life. No doubt the mother has a right to decide what shall happen in and to her body; everybody would grant that. But surely a person's right to life is stronger and more stringent than the mother's right to decide what happens in and to her body, and so outweighs it.

By listing the premises and the arg-conclusion, we can **Present** a formal argument for the argument's conclusion. Suppose we wish to extract an argument from Thomson for the arg-conclusion that abortion is immoral. The first premise from Thomson's text could be

(1) Everyone has a right to life.

The second premise could be:

(2) So the fetus has a right to life.

Recall that 'so' indicates an arg-conclusion. And (2) is one of the arg-conclusions we identified above. That's OK; often, the arg-conclusion of one argument is a premise in another. In the argument we're considering, (2) is part of the support for our main arg-conclusion, but it is in turn supported by (1). So in the argument we are constructing, (2) is a *sub-conclusion*.

The third premise might be:

(3) A person's right to life is stronger and more stringent than the mother's right to decide what happens in and to her body.

A further sub-conclusion is:

(4) So, a person's right to life outweighs the mother's right to decide what happens in and to her body.

Finally, we might conclude:

(5) Therefore, abortion is immoral.

Once you've completed this, you will have completed the first PEE step: **Presenting** an argument. We are now in a position to present Thomson's argument as follows:

1. Everyone has a right to life.
2. So the fetus has a right to life.
3. A person's right to life is stronger and more stringent than the mother's right to decide what happens in and to her body.
4. So a person's right to life outweighs the mother's right to decide what happens in and to her body.
5. Therefore, abortion is immoral.

It is worth noting that there is no unique, correct extracted argument for many passages that contain arguments. One of us extracted the following argument from Thomson's passage:

1. Every person has a right to life.
2. If a person has a right to life, then s/he should not be killed.
3. A fetus is a person.
4. Therefore, a fetus should not be killed.

This does not mean that all extracted arguments are equally good, however. Some may be better since they employ more plausible premises, some may seem more "logical" than others, or some may be more faithful to what the author had in mind.

(1-5) includes an arg-conclusion and Thomson's *explicit* premises. In the next section, we will discuss a strategy for adding *implicit* premises to an argument.

Formulate implicit premises so as to make the argument valid.

There are two ways an argument can go wrong: its premises can fail to support its arg-conclusion, or the argument could have false premises. If an argument's premises fail to support its arg-conclusion, then the argument is *invalid*. If an argument has false

premises, then it is *unsound*. It is important to be able to construct valid arguments, since the premises of a valid argument are guaranteed to support the conclusion. That is, a <u>valid</u> argument is an argument where the conclusion is guaranteed to be true, if the premises are true. Here's a slogan: **Truth of the premises guarantees truth of the conclusion.** Another way to put the same idea is that if an argument is valid, it's impossible for its premises to all be true, yet its conclusion false.

It's important for your argument to be valid. Sometimes an argument's premises fail to support its conclusion. That's bad. So we want to make sure that none of our arguments turn out this way. When we evaluate the arguments of others, we want to be charitable and formulate their arguments in a way that makes them valid.

In addition, facility with formulating valid arguments increases your options as a writer. Often, authors leave implicit premises unstated and undefended. In constructing a valid argument, we identify implicit premises. In explaining the argument, we give support for each premise. It is often the case that, in the course of PEE-ing an argument, one discovers that, in order for the argument to be valid, weak implicit premises must be included. These weaknesses may be glossed over in the passage from which the argument is PEE-ed. But PEE-ing the argument exposes these weaknesses, providing authors with more options for resisting a premise in the argument.

Digression: Inductive Arguments

What is it for premises to support a conclusion? That's a very hard question to answer adequately. There *are* invalid arguments where the premises support the conclusion. In fact, most of us usually encounter invalid arguments where the premises

support the conclusion in some way or other. Many of these arguments are <u>inductive</u> <u>arguments</u>. Consider the following:

4. Tweety is a bird.
5. Therefore, Tweety flies.

The truth of (4) surely gives us a good reason to think that (5) is true. So (4) supports (5), though (4-5) is clearly invalid, as are all inductive arguments. The truth of (4) does not *guarantee* the truth of (5). After all, Tweety could be a penguin, Tweety could be a chick that's not old enough to fly, Tweety could be dead, and so on. Here's another (inductive) argument that gives support for the conclusion yet is not valid:

6. The last 10,000 swans I've seen have been white.
7. Therefore, if I see another swan, it will be white.

It turns out that there are black swans in Australia. But even if there weren't, this argument would not be valid because it would still be possible for there to be non-white (visible) swans, and that would be enough to make the argument invalid. Remember: if the argument's valid, it's not even *possible* for the premises to be true but the conclusion false. If an argument is deductively valid, **truth of the premises *guarantees* truth of the conclusion.**

Fortunately, there is a procedure for turning any inductive argument into a valid argument. The most straightforward way to do this is to *weaken the arg-conclusion*. Here are reformulations of (4-5) and (6-7) as valid arguments:

4*. Tweety is a bird.
4.5*. If Tweety is a bird, then it is probable that Tweety flies.
5*. Therefore, it is probable that Tweety flies.

6*. The last 10,000 swans I've seen have been white.
6.5*. If the last 10,000 swans I've seen have been white, then it is probable that,
     if I see another swan, it will be white.
7*. Therefore, it is probable that, if I see another swan, it will be white.

In the remainder of this section, we'll discuss a procedure for rendering any argument

valid.

End of digression

We want our premises to support our conclusions. We've seen that an argument

does not absolutely have to be valid in order to support its conclusion. So why is it so

important that our arguments are valid? It is important for an argument to be valid

because a valid argument is *guaranteed* to support its conclusion. With invalid

arguments, there is no such guarantee. Valid arguments are like insurance for your essay.

In addition, as we mentioned above, PEE-ing arguments and making them valid gives

authors more choices since it often reveals weaknesses in an argument that are otherwise

very difficult to detect. That is because rendering an argument valid reveals its *implicit*

premises.

So to quickly recap, in order to begin to PEE an argument, one must find the the

arg-conclusion and the main premises used to support it. One should look for the arg-

conclusion first and work backward to uncover the premises, using the strategies

suggested above. Premises come in two flavors: explicit and implicit. Use the tips from

the previous section to uncover explicit premises. Then follow the procedure in this

section to render the argument valid. In so doing, you will uncover the implicit premises in the argument, if any. The result is a correctly presented valid argument.

So recall that an argument is valid if the truth of the premises guarantees the truth of the conclusion. But how do we know when the truth of the premises guarantees the truth of the conclusion?

Some arguments are valid merely in virtue of their <u>form</u>. The form of an argument is the way in which its meaningful parts are "put together." Consider the following argument:

23. Some swans are white.
24. Some pigs are fat.
25. Therefore, some swans are white and some pigs are fat.

It is impossible for it to be the case that (23) and (24) are true, yet (25) is false, so (23-25) is valid. We can abstract away from the specific sentences used in (23-25) to make explicit the valid argument form. Consider (26-28):

26. Blahblah.
27. Bleeblee.
28. Therefore, Blahblah **AND** Bleeblee.

If we replace 'blahblah' and 'bleeblee' with any sentences whatsoever, we form a valid argument. In (26-28), 'blahblah' and 'bleeblee' are place-holders for sentences. We sound less silly if we use capital letters instead of nonsense expressions. But which expressions should we abbreviate with capital letters? In order to find out, we need to distinguish between **simple** and **compound** statements.

A statement S is <u>simple</u> if, and only if, it does not contain any <u>logical connectives</u>.

 A statement S is <u>compound</u> if, and only if, it is not simple.

<u>Logical connectives</u> are expressions that are used to build logically complex statements out of simpler statements. For example, the occurrence of 'and' in (25) functions to conjoin the simpler statements (23) and (24). The main logical connectives we will be concerned with are:

Conjunction: 'and', 'but', 'while', 'even though', 'yet', 'nevertheless', ';' [2]

Negation: 'not', 'it is not the case that', 'it's false that', 'un-', 'im-', some uses of 'no'

Disjunction: 'either …, or', 'or'

Conditional: If … , then …

In order to correctly represent the logical form of an argument, we adopt the following rule:

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[2] 'And' may be used between statements to form a logical conjunction, as in:

Bob was breakdancing **and** Chris was breakdancing.

'And' may also be used to conjoin sub-sentential expressions, like main verbs, auxiliary verbs, adverbs, objects, or subjects, as in:

Bob killed **and** ate the innocent furry bunny.
Bob was **and** will be breakdancing.
Chris breakdances quickly **and** quietly.
Bob ate hash **and** Twinkies.
Bob **and** Chris fought the bad guys.

Similar points hold for 'or', though 'or' may, in addition, be used to disjoin adjectives, as in:

I have either the meanest **or** the ugliest instructor.

Rule 1: Each simple sentence in the argument is assigned exactly one letter.

If two sentences in an argument are exactly the same, they get exactly the same letter. Sometimes, two sentences are not exactly the same, but should be assigned the same letter since they are *paraphrases* of each other; that is, they have roughly the same meaning. Otherwise, we assign a letter that has not been previously used to the new sentence. To this end, we adopt the following rule:

Rule 2: If two distinct simple statements can be properly treated as paraphrases of each other, relative to the context of an argument in which they occur, then each should be symbolized by the same statement letter.

Consider (23-25) again. The first sentence that occurs is 'some swans are white'. Let's assign 'P' to this sentence whenever it occurs in the argument. Thus, we re-write (23-25) as:

26. P
27. Some pigs are fat.
28. Therefore, P and some pigs are fat.

Now we move to the next sentence in (23-25), which is 'some pigs are fat'. This sentence is different from any other sentence we have encountered so far, so it gets a different letter. Let's assign 'Q' to (24). So we may re-write (23-25) as:

29. P
30. Q
31. Therefore, P and Q

It is very important to note that we can substitute in any sentences whatsoever for 'P' and

'Q', whether or not they are true, and we still get a valid argument. Consider (32-34):

32. Pigs can fly.
33. The moon is made of green cheese.
34. Therefore, pigs can fly and the moon is made of green cheese.

Notice that (32-34) is valid. Were the premises true, the conclusion would have to be

true as well. A rough-and-ready (though imperfect) test is this: imagine a situation in

which the premises are true. Is the conclusion true in that situation? Does it have to be?

When we imagine that, contrary to fact, pigs fly and the moon is made of green cheese,

we are imagining a situation in which the premises of (32-34) are true. But that must also

be a situation in which the conclusion is true. So the argument is valid.

It is very easy to see that a very simple argument form, like (32-34), is valid once

we present the argument in a way that makes its form explicit. It is not as easy with some

other argument forms. Fortunately, most arguments in texts or that we think up do not

have very complicated forms, or need not have very complicated forms. If we familiarize

ourselves with a few common valid forms, we have all we need to extract and present

valid arguments. The following are seven very common argument forms:

Modus Ponens (MP)

    (1MP) If α, then β.

    (2MP) α

    (3MP) Therefore, β

Modus Tollens (MT)

    (1MT) If α, then β.

    (2MT) Not-β.

    (3MT) Therefore, Not-α.

Hypothetical Syllogism (HS)

Reductio ad Absurdum (R)

(1HS) If α, then β.   (1R) Assume α.

(2HS) If β, then φ.   . . .

(3HS) Therefore, if α, then φ.   (nR) β and Not-β. (Alternatively: if

                                             β, then Not-β, and if Not-β, then β.)

                                             (n+1R) Therefore, Not-α.

Disjunctive Syllogism (DS)   Dilemma (D)

(1DS) α or β.   (1D) α or β.

(2DS) It's not the case that α.   (2D) If α, then φ.

(3DS) Therefore, β.   (3D) It's not the case that φ.

                                             (4D) Therefore, β.

And, as we saw above,

Conjunction (C)

(1C) α

(2C) β

(3C) Therefore, α and β.

Any argument that has one of these forms is valid. That is, the truth of the premises

guarantees the truth of the conclusion.

Digression: Use of Greek Letters

We use Greek letters to specify the argument forms instead of capital letters, since

we chose capital letters to abbreviate only simple statements. The Greek letters may be

replaced by either simple or compound statements. For example, the following argument

is an instance of Modus Ponens:

35. If either Bob or Chris sings, then I'll throw up and run away.
36. Either Bob or Chris sang.
37. So, I threw up and ran away.

In (35-37), α is 'either Bob or Chris sings' (and its paraphrases, ignoring tense) and β is

'I'll throw up and run away' (and its paraphrases, again, ignoring tense). But since these

statements are both logically compound, we cannot symbolize (35-37) as:

35*. If P, then Q.
36*. P
37*. Therefore, Q.

Rather, we must symbolize (35-37) as:

35**. If (P or Q), then (R and S).
36**. P or Q.
37**. So, R and S.

(Note that our choice of letters is arbitrary but our symbolization is not. Any letter may

be used for any simple statement, as long as the resulting symbolization conforms to

Rules 1 and 2.)

End of Digression

Another Digression: Validity-Checking Algorithms on the Web

Logicians have devised powerful algorithms for detecting the validity of

arguments. We will not study these procedures in this course. However, if an argument

is correctly symbolized, it may be checked for validity via these more powerful

algorithms at the following websites:

Truth Table Constructor: http://sciris.shu.edu/~borowski/Truth/

Truth Tree Proof Generator: http://www.umsu.de/logik/trees/

It is strongly recommended that you try to formulate your own arguments and the

arguments you encounter in terms of the common valid argument forms, at least initially.

End of Digression

Let's (finally!) see how to make an argument valid by adding implicit premises.

In the remainder of this section, we consider three extended examples. In presenting each

of the arguments, different issues arise that you might encounter when trying to render

and argument valid. It is recommended that you read the first example carefully and

skim the second two. Use these examples as guides if you are stuck when trying to

validly formulate arguments on your own.

Example I: A Simple Argument Against Abortion

Consider the following argument:

1. If a fetus is alive, then intentionally killing it is murder.
2. So, abortion is murder.

(1-2) seems logical. But is it valid? We can determine whether it is by symbolizing it to

examine its logical form. We start by applying our **Rule 1: Each simple sentence in the**

argument is assigned exactly one capital letter. Consider sentence (1). Does it contain any logical connectives? Yes. It is a conditional, since it is of the form, 'If . . . , then . . '. So we need to examine the "if"-part and the "then"-part to see if they contain logical connectives. The "if"-part of (1) is "A fetus is alive." This does not contain logical connectives. So according to Rule 1, it is assigned a single capital letter. Let's assign 'A' to it. We may then rewrite the argument as follows:

1. If A, then intentionally killing it is murder.
2. So, abortion is murder.

Next we apply Rule 2 and check if any other part of the argument is a paraphrase of "A fetus is alive." It is not, so we move on to consider the "then"-part of (1). We use a distinct letter to symbolize the "then"-part:

1. If A, then B
2. So, abortion is murder.

Finally, consider (2). It is a simple statement since it contains no logical connectives. So we assign it another letter:

1. If A, then B
2. So, C

Now we check to see if the argument is valid. If the form of the argument is either (MP), (MT), (DS), (D) or (C), then it's valid. Unfortunately, our argument fits none of these forms! So even though the argument sounds logical in English, it turns out that its

correct symbolization is invalid. That is, the truth of the premises does not guarantee the truth of the conclusion. What do we do?

At this point, we have several options. Recall that what we are trying to do is to formulate the implicit premises in (1-2) to make the argument valid. This would be easy if (1-2) were valid, but, as we have seen, it is not. Now we need to think about what premises need to be added to the argument to make it valid. We can cheat by peeking at what the valid form should look like. We know that if the argument form is either (MP), (MT), (DS), or (C), then the argument is valid. One strategy for rendering an argument valid is to figure out which **completion** of the argument is best. The completion of the argument that is best is the one that makes the argument valid and best represents the author's reasoning. Figuring out which completion is best often takes some creativity. We can begin by examining the logical form of the arg-conclusion of our argument.

Recall our argument forms:

Modus Ponens (MP)
- (1MP) If α, then β.
- (2MP) α
- (3MP) Therefore, β

Modus Tollens (MT)
- (1MT) If α, then β.
- (2MT) Not-β.
- (3MT) Therefore, Not-α.

Hypothetical Syllogism (HS)
- (1HS) If α, then β.
- (2HS) If β, then ϕ.
- (3HS) Therefore, if α, then ϕ.

Reductio ad Absurdum (R)
- (1R) Assume α.
- . . .
- (nR) β and Not-β. (Alternatively: if β, then Not-β, and if Not-β, then β.)
- (n+1R) Therefore, Not-α.

Disjunctive Syllogism (DS)
- (1DS) α or β.

Dilemma (D)
- (1D) α or β.

(2DS) It's not the case that α.   (2D) If α, then φ.

(3DS) Therefore, β.   (3D) It's not the case that φ.

                                            (4D) Therefore, β.

Conjunction (C)

    (1C) α

    (2C) β

    (3C) Therefore, α and β.

       We may begin by noting the logical form of the arg-conclusion. Since certain

forms always have a specific logical form for the arg-conclusion, we can eliminate

certain candidate forms off the bat. For instance, the arg-conclusion is not of the form,

"Therefore, α and β." So we can rule out Conjunction. We can also rule out Reductio

and Modus Tollens, since the arg-conclusion is not of the form, "Therefore, Not-α."

Finally, we may rule out (HS), since the arg-conclusion is not of the form, "Therefore, if

α then β." So the remaining candidate argument forms are:

Modus Ponens (MP)

    (1MP) If α, then β.

    (2MP) α

    (3MP) Therefore, β

Disjunctive Syllogism (DS)   Dilemma (D)

    (1DS) α or β.   (1D) α or β.

    (2DS) It's not the case that α.   (2D) If α, then φ.

    (3DS) Therefore, β.   (3D) It's not the case that φ.

                                            (4D) Therefore, β.

Next, we can use the premise, (1), to give us a place to start on narrowing down candidate argument forms. Since (1) is a conditional, we can start with (MP). Let's consider (MP) first. The most straightforward way to make the argument valid by Modus Ponens involves adding (MP2) as a premise. But what should the premise say? We want to fill in the following argument:

> (MP1) If a fetus is alive, then intentionally killing it is murder.
> (MP2) ????
> (MP3)So, abortion is murder.

It seems we should replace (MP2) with the 'if'-part of (1), but according to the form of the argument, (MP2) should be the conclusion, (2). So it seems that the most straightforward way of trying to render (1-2) valid by Modus Ponens is either:

> (MP1) If a fetus is alive, then intentionally killing it is murder.
> (MP2) A fetus is alive
> (MP3) So, abortion is murder.

> (MP1) If a fetus is alive, then intentionally killing it is murder.
> (MP2) Abortion is murder.
> (MP3) So, abortion is murder.

But neither of these arguments are instances of Modus Ponens. (Neither is even valid.)

Note, however, that the following argument *is* valid by Modus Ponens:

> (MP1) If a fetus is alive, then intentionally killing it is murder.
> (MP2) A fetus is alive
> (MP3) So, intentionally killing a fetus is murder.

But this argument does not contain our conclusion. More work must be done. Let's treat the third premise as a sub-conclusion and see if we can argue validly from it to our conclusion. So our goal now is to fill in the gaps in the following argument scheme:

       1. If a fetus is alive, then intentionally killing it is murder.
       2. A fetus is alive.
       3. So, intentionally killing a fetus is murder.
       ????
       Conclusion: So, abortion is murder.

In symbols:

       1. If A, then B
       2. A
       3. So, B
       ????
       Conclusion: So, C

So what we now want is a way of validly inferring C from B and some other premise or premises. But notice that by applying our procedure of comparing the logical form of the premise and the conclusion with our argument forms, we may infer the conclusion from (3) and the premise, "If B, then C" by Modus Ponens:

       1. If A, then B
       2. A
       3. So, B
       4. If B, then C
       5. So, C

We can justify each inference in this argument by Modus Ponens. Our sub-conclusion, (3), follows from (1) and (2) by Modus Ponens. Our arg-conclusion, (5), follows from (3) and (4) by another application of Modus Ponens. So (1-5) is valid; truth of its premises guarantees truth of its arg-conclusion.

We should now translate our argument back into English to see if it "works"; if it is an argument that the author might plausibly accept. Replacing 'A', 'B', and 'C' with the English statements they abbreviate, we have:

1. If a fetus is alive, then intentionally killing it is murder.
2. A fetus is alive
3. So, intentionally killing a fetus is murder.
4. If intentionally killing a fetus is murder, then abortion is murder.
5. So, abortion is murder.

At this point, we have extracted a valid argument. We have added implicit premises (2-4) in order to make the argument valid.

Let's sum up our strategy for making arguments valid. First, we start with explicit premise(s) and the arg-conclusion. Next we symbolized the argument to make its logical form explicit. Then we tried to convert our invalid symbolized argument into a valid argument by finding its *completion*. There are two steps to finding an argument's completion. First, we compared the logical form of the arg-conclusion with the logical forms of the arg-conclusions in our valid argument forms. Next, we looked at the logical forms of the premises to see which valid argument form might work best for us. It is noteworthy that, for (1-2), *none* of the forms we considered could help us make (1-2) valid by only adding a premise or two. So we used a sub-conclusion to help us infer our arg-conclusion. We ended up "linking" two uses of Modus Ponens. That is fine. Remember, the arg-conclusion of one argument may be the sub-conclusion in another argument. Finally, we translated our argument back into English to see whether it made sense. It seems that we succeeded in offering plausible premises on the author's behalf.

These are the *implicit* premises that needed to be added in order to make our argument valid.

Example III: An Argument from Thomson Against Abortion

Now let's consider a more complex example. Recall our earlier argument from Thomson about abortion. Our arg-conclusion was that abortion is immoral. We identified the following explicit premises:

1. Everyone has a right to life.
2. So the fetus has a right to life.
3. A person's right to life is stronger and more stringent than the mother's right to decide what happens in and to her body.
4. So a person's right to life outweighs the mother's right to decide what happens in and to her body.
5. Therefore, abortion is immoral.

Our argument sounds pretty good. But is it valid? Let's see. In order to assess (1-5) for validity, we must first symbolize it to reveal its form. We start by applying our rule: **Each simple sentence in the argument is assigned exactly one capital letter.** Consider sentence (1). Does it contain logical connectives? No. So we symbolize it using a capital letter. Let's spice things up by using 'P'. Next, we re-write (1) as:

(1) P

Now we are done symbolizing (1). We have abbreviated the atomic sentence using a capital letter. We may now re-write our argument as follows:

1. P
2. So the fetus has a right to life.

3. A person's right to life is stronger and more stringent than the mother's right to decide what happens in and to her body.
4. So a person's right to life outweighs the mother's right to decide what happens in and to her body.
5. Therefore, abortion is immoral.

Next, we check and see if the sentence we symbolized using 'P' appears anywhere else in the argument. It does not, so we may move on to (2).

Is (2) a simple statement? As with (1), (2) is simple. But (2) is not a paraphrase of (1), so according to Rule 2, we need to assign it a different letter:

(2) Q

Since (2) is a sub-conclusion, we will retain the conclusion-indicator term in our symbolization:

(2) So, Q

Now we re-write our argument as follows:

1. P
2. So, Q
3. A person's right to life is stronger and more stringent than the mother's right to decide what happens in and to her body.
4. So a person's right to life outweighs the mother's right to decide what happens in and to her body.
5. Therefore, abortion is immoral.

Let's move on to (3). (3) is actually quite complicated, since (3) contains two occurrences of 'and'. (3) may be understood as a conjunction of the following simple statements:

(3a) A person's right to life is **stronger** than the mother's right to decide what happens **in** her body.

(3b) A person's right to life is **stronger** than the mother's right to decide what happens **to** her body.

(3c) A person's right to life is **more stringent** than the mother's right to decide what happens **in** her body.

(3b) A person's right to life is **more stringent** than the mother's right to decide what happens **to** her body.

So let's re-write (3) to make the conjunction more explicit:

(3) A person's right to life is **stronger** than the mother's right to decide what happens **in** her body **<u>and</u>** a person's right to life is **stronger** than the mother's right to decide what happens **to** her body **<u>and</u>** a person's right to life is **more stringent** than the mother's right to decide what happens **in** her body **<u>and</u>** a person's right to life is **more stringent** than the mother's right to decide what happens **to** her body.

Though writing (3) this way is much more stilted, it makes the logical form of (3) explicit. Now we need to assign letters to the simple sentences in (3). Since none is a paraphrase of any other or of ones that have preceded (though (3) and (4) have several phrases in common), we need to assign new letters to each of the simple statements in (3):

1. P
2. So, Q
3. R and S and T and U
4. So a person's right to life outweighs the mother's right to decide what happens in and to her body.
5. Therefore, abortion is immoral.

Now consider (4). (4) contains one occurrence of 'and'. So we first re-write (4) to make its logical form more explicit:

> (4) So a person's right to life outweighs the mother's right to decide what happens **in** her body **<u>and</u>** a person's right to life outweighs the mother's right to decide what happens **to** her body.

The simple statements in (4) are then assigned new letters:

1. P
2. So, Q
3. R and S and T and U
4. So V and W
5. Therefore, abortion is immoral.

Finally, consider (5). (5) is a negation, as is signaled by 'im-'. So we can understand (5) as saying, 'It's not the case that abortion is moral.' We may now re-write our fully symbolized argument as follows:

1. P
2. So, Q
3. R and S and T and U
4. So V and W
5. Therefore, Not-X

Now we check to see if the argument is valid. (1-5) is a compound argument, since it contains sub-arguments. So to check for validity, we need to check each sub-argument. The first sub-argument is from (1) to (2). If the form of the argument is either (MP), (MT), (DS), (D) or (C), then it's valid. Unfortunately, our argument fits none of these forms! So even though the argument sounds pretty good in English, it turns out that its correct symbolization is invalid. That is, the truth of the premises does not guarantee the truth of the conclusion. What do we do?

Recall that what we are trying to do is to formulate the implicit premises in (1-2) to make the argument valid. This would be easy if (1-2) were valid, but, as we have seen, it is not. Now we need to think about what premises need to be added to the argument to make it valid. We can cheat by peeking at what the valid form should look like. We know that if the argument form is either (MP), (MT), (DS), or (C), then the argument is valid. Recall that one strategy for rendering an argument valid is to figure out which completion of the argument is best. The completion of the argument that is best is the one that makes the argument valid and best represents the author's reasoning. Figuring out which completion is best often takes some creativity. We can begin, as before, by plugging what we have into the valid argument forms and seeing what they would sound like in English. But one shortcut involves realize that, **often, if a single statement is offered as a reason for an arg-conclusion, then the argument should be symbolized using Modus Ponens.** So we may infer Q from P by Modus Ponens if we add an intermediary premise that says, 'If P, then Q.' Let's re-write our argument with this new premise:

1. P
2. If P, then Q
3. So, Q   (from 1, 2 by Modus Ponens)
4. R and S and T and U
5. So V and W
6. Therefore, Not-X

In (1-6), the first sub-conclusion, (3), follows from (1) and (2) by Modus Ponens. So (1-3) is valid. Now we need to see if the inference to (5) is valid, since it is the next sub-

conclusion under consideration. We see that it is not. But we may apply Modus Ponens

on the reason given in favor of (5). That reason is (4). So we may write:

1. P
2. If P, then Q
3. So, Q   (from 1, 2 by Modus Ponens)
4. R and S and T and U
5. If (R and S and T and U), then (V and W)
6. So V and W   (from 4, 5 by Modus Ponens)
7. Therefore, Not-X

Now (1-6) is valid. We already knew that (3) follows from (1) and (2) by Modus Ponens.

Now (6) follows from (4) and (5) by Modus Ponens as well. So we are left to consider

whether the arg-conclusion (7) follows from the premises we have so far.

It does not. A dead giveaway is that 'X' does not appear on any preceding line of

the argument. **In general, if an arg-conclusion contains statements that are not**

among the premises, the argument is invalid. So how should we proceed? We begin

by noting that, **in general, an argument that contains sub-conclusions must use those**

sub-conclusions in inferring the arg-conclusion. That means that we must use (3) and

(6) as premises to derive our arg-conclusion. The reason is simple. If we did not use (3)

and (6), our argument would contain **idle premises**: premises that are not used in

deriving the arg-conclusion. Idle premises are undesirable because they do no work in

obtaining the arg-conclusion. Such premises may be omitted from an argument and the

argument will remain valid.

1. P
2. If P, then Q   (from 1, 2 by Modus Ponens)
3. So, Q

4. R and S and T and U
5. If (R and S and T and U), then (V and W)
6. <u>So V and W</u>   (from 4, 5 by Modus Ponens)
7. <u>Therefore, Not-X</u>

A simple strategy to get us validly from some premises to an arg-conclusion is to conjoin and conquer. That is, we may infer the conjunction of those premises by (C), and then add a conditional premise to obtain the arg-conclusion. So the first step is to add another sub-conclusion which infers the conjunction of (3) and (6):

1. P
2. If P, then Q
3. So, Q   (from 1, 2 by Modus Ponens)
4. R and S and T and U
5. If (R and S and T and U), then (V and W)
6. So V and W   (from 4, 5 by Modus Ponens)
7. Therefore, Q and V and W.   (from 3, 6 by Conjunction)
8. Therefore, Not-X

Now we need add only one more premise to the argument to allow us to validly infer our conclusion:

1. P
2. If P, then Q
3. So, Q   (from 1, 2 by Modus Ponens)
4. R and S and T and U
5. If (R and S and T and U), then (V and W)
6. So V and W   (from 4, 5 by Modus Ponens)
7. Therefore, Q and V and W.   (from 3, 6 by Conjunction)
8. If (Q and V and W), then Not-X
9. Therefore, Not-X   (from 7, 8 by Modus Ponens)

We now have a formally valid argument. To complete the argument's presentation, let's translate it back into English:

1. Everyone has a right to life.
2. If everyone has a right to life, then a fetus has a right to life.
3. So, a fetus has a right to life.
4. A person's right to life is stronger and more stringent than the mother's right to decide what happens in and to her body.
5. If (A person's right to life is stronger and more stringent than the mother's right to decide what happens in and to her body.), then (a person's right to life outweighs the mother's right to decide what happens in and to her body).
6. So a person's right to life outweighs the mother's right to decide what happens in and to her body.
7. Therefore, a fetus has a right to life and a person's right to life outweighs the mother's right to decide what happens in and to her body.
8. If (a fetus has a right to life and a person's right to life outweighs the mother's right to decide what happens in and to her body), then abortion is immoral.
9. Therefore, abortion is immoral.

We have now successfully presented the argument. What follows are some passages that you can use to help you become acquainted with presenting arguments:

We can now move on to <u>explaining</u> the arguments. (Note: depending on your instructor, the argument that you present may not be presented in numbered premise-conclusion form in your finished essay. In fact, presenting arguments this way is fairly uncommon outside of philosophy and some math.)

Explaining Arguments

To **explain** an argument that you have extracted, do the following:

(a) Define all the technical terms that appear in the argument.

(b) Give reasons for each of the premises of the argument. In some cases, the author's text provides reasons to believe the premise. In other cases, you must provide reasons which would lead a reasonable person to accept the premise,

preferably reasons that you think the author would accept and that are consistent with the other premises of the argument.

Define all the technical terms that appear in the argument.

If your premises contain an expression that you expect is unfamiliar to your readership, or you are using a specific expression in a non-standard way, then that expression is a <u>technical term</u> for your readership and your argument. The first step in explaining an argument involves defining all technical terms, so your audience knows just what you mean by the argument(s) under consideration. Another reason to define technical terms is to avoid equivocation (using the same type of expression in two different ways), as in the following:

1. Barry Bonds swung a bat with cork in it.
2. A bat is a small flying mammal.
3. So Barry Bonds swung a small flying mammal with cork in it.

(1-3) is a silly and obvious example of equivocation, but other cases are less silly and obvious. Here's a more common argument whose appeal arguably depends on equivocation:

1. McX is a good general.
2. If McX is a good general, then he would be a good president.
3. So McX would be a good president.

Evaluative terms such as 'good' are highly susceptible to equivocation.

More commonly, technical terms will be the terms members of a particular discipline learn to use as 'terms of art.' They are usually unfamiliar to readers who are not members of the discipline and used with different meanings by different writers. Recall one of the arguments we considered above.

1. Everyone has a right to life.
2. If everyone has a right to life, then a fetus has a right to life.
3. So the fetus has a right to life.
4. A person's right to life is stronger and more stringent than the mother's right to decide what happens in and to her body.

5. If (A person's right to life is stronger and more stringent than the mother's right to decide what happens in and to her body), then (a person's right to life outweighs the mother's right to decide what happens in and to her body).
6. So a person's right to life outweighs the mother's right to decide what happens in and to her body.
7. Therefore, a fetus has a right to life and a person's right to life outweighs the mother's right to decide what happens in and to her body.
8. If (a fetus has a right to life and person's right to life outweighs the mother's right to decide what happens in and to her body), then abortion is immoral.
9. Therefore, abortion is immoral.

Several terms would certainly need definition in order to explain this argument:

- Right
- Right to life
- Fetus
- Person

Depending on your readership you might also need to supply definitions for these terms as well:

- Stronger
- More Stringent
- Outweighs
- Immoral
- In and to her body

Let's use the 'right to life,' 'person', and 'in her body' as examples. You might write a paragraph defining these terms like this for a student essay:

> In order to explain the argument against abortion given by Thomson, we need to understand the terms used in the argument. The 'right to life' claimed for the fetus is the right to go on living without being killed; it is a basic assumption that every person, including the fetus has a 'right to life.' In this argument 'person' is understood as any human being, starting from the time of conception. Other definitions of 'person,' such as the definition given in class as 'someone who make autonomous decisions,' would not include the fetus in the definition of person. The argument also depends on the meaning of 'in and to her body.' During pregnancy the fetus is in the woman's body even though it is a separate person, so 'in her body' means anything inside her body, including another person who depends on her for life.

You would discuss other terms requiring definition in the same way. Notice that this writer gives the definitions of key terms and distinguishes the definitions used in the argument from other possible definitions. The definition of 'person' makes explicit that the writer is using the term with a particular meaning that others may not share. In order to know which terms require definition you will need to know your readership.

Give reasons for each of the premises of the argument.

In some cases, the author's text provides reasons to believe the premise. In other cases, you need to provide reasons for a reasonable person to accept the premises, preferably reasons that the author would accept and that are consistent with the other premises of the argument.

Here are reasons that might typically be given for the premises in the argument above.

1. Everyone has a right to life.

(a) The right to go on living without interference or harm from others is the most basic right.

(b) The Constitution mentions the 'right to life' as an inalienable right, meaning it is a right that can't be taken away.

2. If everyone has a right to life, then a fetus has a right to life.

Note the (2) is a conditional, and conditionals require special explanation. To explain a conditional, always <u>assume</u> the "if"-part and give reasons in favor of the "then"-part.

(c) Assume that everyone has the right to life. Since the fetus is a person and every person has a right to life, the fetus has a right to life. So (2) is true.

Premise (3) is a sub-conclusion. If follows validly by Modus Ponens from (1) and (2). Since it's a sub-conclusion of a valid argument, we don't need to offer reasons for it. We

offer reasons for the premises that support it. If the premises are true, then the sub-conclusion must be true also, since the argument is valid.

3. So the fetus has a right to life.

Now consider premise (4):

4.A person's right to life is stronger and more stringent than the mother's right to decide what happens in and to her body.

Here are reasons to think that (4) is true.

(e) Since the right to life is the basis of all other rights and without living a person cannot exercise other rights, it takes more to violate the right to life than to violate the right to decide what happens in your body.

(f) A right is more stringent than another if the right requires stronger reasons to override its exercise by the rights-bearer. The right to life requires stronger reasons to override it than the right to determine what happens in one's body.

Now premise (5):

(5) If (a person's right to life is stronger and more stringent than the mother's right to decide what happens in and to her body) then (a person's right to life outweighs the mother's right to decide what happens in and to her body).

Since (5) is another conditional, we proceed by assuming the "if"-part and giving reasons for the "then"-part:

(g) Suppose that a person's right to life is stronger and more stringent than the mother's right to decide what happens in and to her body. We want to give reasons for thinking that is that is true, then a person's right to life outweighs the mother's right to decide what happens in and to her body. So, suppose that a person's right to life **does not** outweigh the mother's right to decide what happens in and to her body. Then a person's right to life is **not** stronger and more stringent than the mother's right to decide. So (5) is true.

(6) and (7) are sub-conclusions:

> (6) So a person's right to life outweighs the mother's right to decide what happens in and to her body.
>
> (7) Therefore, a fetus has a right to life and a person's right to life outweighs the mother's right to decide what happens in and to her body.

Line (6) Follows from (4) and (5) by Modus Ponens and (7) follows from (3) and (6) by Conjunction.No additional explanation is needed since these are sub-conclusions. Finally, consider (8)

> (8) If (a fetus has a right to life and person's right to life outweighs the mother's right to decide what happens in and to her body), then abortion is immoral.

Since (8) is a conditional premise, we assume the "if"-part and give reasons for the "then"-part.

(h) Suppose a fetus has a right to life and person's right to life outweighs the mother's right to decide what happens in and to her body. If a mother aborts a fetus, she disregards the fetus's right to life in favor of her right to decide what happens in and to her body. But when someone disregards a more stringent right in favor of a less stringent right, then do something immoral. If that's so, then abortion is immoral. So (8) is true.

> Line (9) is the conclusion. It follows validly from (7) and (8) By Modus Ponens, so no additional explanation is needed. .

Here are some things to note about the process of giving reasons. First, not all the reasons given for the premises are equally good reasons. An important part of your CAS class will be learning about what makes a good reason. Second, giving reasons sometimes involves giving sub-arguments in support of a premise. Third, the explanations don't

need to *prove* the premises; the explanations must give reasons for a premise that would appeal to a neutral and interested third party.

Evaluating Arguments

To **evaluate** an argument you have extracted and explained, do the following:

(a) Identify the weakest premise of the argument and criticize it. Be sure to specify which premise you are criticizing.

(b) Evaluate your evaluation: is the objection you present sound? Why or why not? If the objection is unsound, state which premise is false and why.

Point out the weakest premise of the argument and criticize it.

A good way to criticize an argument is to present another argument with a conclusion that is the negation of the premise you are criticizing. Be sure to explain that argument and to specify which premise you are criticizing. Recall the argument we are evaluating:

1. Everyone has a right to life.
2. If everyone has a right to life, then a fetus has a right to life.
3. So the fetus has a right to life.
4. A person's right to life is stronger and more stringent than the mother's right to decide what happens in and to her body.
5. If (A person's right to life is stronger and more stringent than the mother's right to decide what happens in and to her body), then (a person's right to life outweighs the mother's right to decide what happens in and to her body).
10. So a person's right to life outweighs the mother's right to decide what happens in and to her body.
11. Therefore, a fetus has a right to life and a person's right to life outweighs the mother's right to decide what happens in and to her body.
12. If (a fetus has a right to life and person's right to life outweighs the mother's right to decide what happens in and to her body), then abortion is immoral.
13. Therefore, abortion is immoral.

In the paragraph below we give an example which criticizes premise (4) by presenting an argument that has for its conclusion 'The mother's right to decide what happens in and to her body outweighs a person's right to life.' Technically the negation of (4) would be 'It

is not the case that a person's right to life outweighs the mother's right to decide what happens in and to her body,' but our conclusion is a paraphrase of the more technical sentence. The sample goes on to evaluate its evaluation.

<div align="center">Sample Argument Evaluation</div>

The argument presented above relies on a premise (4), that a person's right to life outweighs the mother's right to decide what happens in and to her body. I will present an argument against this premise, thereby removing the key support for the conclusion that abortion is immoral. If a woman is pregnant and the fetus is severely disabled, and the child will only live a few days if it is born, as in cases of anencephaly, then it is not immoral to abort the fetus. Here is the argument presented formally:

1. A severely disabled fetus that will only live a few days has no chance of a worthwhile life.
2. If a fetus has no chance of a worthwhile life, then it is not immoral for the mother to abort the fetus.
3. Therefore, it is not immoral for the mother to abort the fetus.
4. If it is not immoral for the mother to abort the fetus, then the mother's right to decide what happens in and to her body outweighs the person's right to life.
5. Therefore, the mother's right to decide what happens in and to her body outweighs the person's right to life.

A reason for premise (1) is that a living few days with no conscious experiences does not meet anyone's standard for a worthwhile life. Infant's born with anencephaly are born with no higher brain function. They will only live a few days, they must be plugged into a respirator the whole time; they have no higher brain function, and cannot respond to sound or touch. A worthwhile life is not just biological existence, but includes the ability to interact and respond to other people. For premise (2), assume that a fetus has no chance of a worthwhile life. The point of giving birth to a child is so that it can live a worthwhile life. So, if the mother knows the fetus will not have a worthwhile life because it lacks higher brain functions, it is morally permitted for her to abort the fetus. In this case, the fetus is a person according to the definition of the 'person' in the argument we are criticizing but it would make no sense to say the fetus's right to life outweighs the mother's right to decide what happens in her body. So it is not immoral for the mother to abort the fetus. So (2) is true.

Since (3) is a sub-conclusion that follows from (1) and (2) by Modus Ponens, it needs no additional explanation.

For (4), suppose that it is not immoral for the mother to abort the fetus. If that's so, then a person's right to life is not always stronger and more stringent than a mother's right to decide. But it then follows that the mother's right to decide what happens in and to her body outweighs the person's right to life. So (4) is true.

The argument concludes that a mother is permitted to abort the fetus if it is unable to have a worthwhile life. This conclusion follows validly from (3) and (4) by Modus Ponens. The argument we criticize supposes that simple biological life is worthwhile but we argue that a short life that lacks any consciousness, interaction with other people, or ability to have experiences is not enough reason to remove the mother's right to decide what happens in her body. So we conclude that (1) through (9) is not sound.

Evaluate your evaluation: is the objection you present sound? Why or why not?

Recall that an argument is sound just in case both (a) it is valid and (b) its premises are all true. Often, you may think an argument or objection is sound. You may be asked to state the best objection to the argument even if you think it is sound. Depending on the assignment, the evaluation of your evaluation is a good place to indicate ways you thing the argument or objection can be improved. If the objection is unsound, state which premise in it is false and why. You do not always need to **PEE** an argument against that premise. We did that above to illustrate one way to evaluate an argument. Often it is sufficient to state which premise you think is the weakest and state a reason or some reasons for thinking it is not true, without presenting a formal argument against the premise.

Glossary

An <u>argument</u> is a set of sentences, one of which is the conclusion.

The <u>conclusion</u> of an argument is a statement of the position being argued for or against.

The <u>premises</u> from which the conclusion is derived are the *reasons* given in support of the conclusion.

A <u>valid</u> argument is an argument where the conclusion is guaranteed to be true, if the premises are true.

A statement S is <u>simple</u> if, and only if, it does not contain any <u>logical connectives</u>.

A statement S is <u>compound</u> if, and only if, it is not simple.

<u>Logical connectives</u> are expressions that are used to build logically complex statements out of simpler statements.