A Logic Lesson

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Instructions

Save a copy of this file. Include your first and last name in the file name.

As you work through the lesson, enter your answers and reflections in the spaces provided.

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A logic problem

No fat creatures run well.

Some greyhounds run well.

What conclusion can you draw from these statements? Take a few minutes to consider your answer before entering it in the box below.

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A logic problem...

No fat creatures run well.

Some greyhounds run well.

Conclusion: Some greyhounds are not fat.

This is an example of an Aristotelian syllogism that was created by author and mathematition Lewis Carroll. Did you draw the correct conclusion?

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Goals of this lesson

Understand the basic types of logic that you might encounter as a technical writer

Recognize logic in the context of software functions and technical documentation

Use your knowledge of logic to recognize potential errors in your documentation and in the software you are writing about

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What is logic?

Logic has been called the science of reasoning.

Logic investigates inferences in terms of the arguments that represent them.

Where have you encountered logic before?

What do you think “inferences” and “arguments” are referring to in this context?

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Spotting logic ‘in the wild’

A logic statement’s argument is made up of premises and a conclusion. The premises provide support for the conclusion.

An inference is the logical connection between premises and conclusion on which the argument relies.

Words such as if, then, and therefore can signal that you’re looking at a logic statement.

Take a few minutes to read through a document that you’ve written recently. Find an example of a logic statement in your writing. Paste it here and keep it handy for the next question.

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The logic of language

Are the arguments that you're presenting in your writing logical?

An error in logic is referred to as a fallacy.

You can use a series of questions to analyze the soundness of your logical arguments.

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The logic of language

Questions to ask:

1. What is my argument?
2. What premises support that argument?
3. What statement serves as the inference to connect the premises and conclusion?
4. How can I back up that inference?
5. Are there contingencies for the conclusion?
6. What counter-arguments that could weaken the conclusion should be acknowledged? (Fulkerson, 1988)

Use these six questions to analyze the logic statement that you found in your writing. Write a paragraph summarizing your answers.

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Statement logic

Statement logic is also known as propositional logic.

Statement logic is the basis for “if” statements in computer programming.

For example:
If profile setting CanEditNotes is false, show the Notes field as read-only.

Look through the development logs in your queue. Find an example of an “if” statement either in the code or in the developer notes and paste it below.

What effect does this “if” statement have on the behavior of the software?

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Statement logic

Propositions and Implications are two basic components of statement logic.

A proposition is a statement with a single truth value. (It can only be true or only be false, not either true or false.)

An implication is an if -> then statement. Implications can also be referred to as conditional statements.

If profile setting CanEditNotes is false, show the Notes field as read-only.

This example from the previous page is an implication. What part of this statement is the proposition?

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Statement logic

A comparison is an operator used in a conditional statement. Examples of such operators include:

Greater than
Equal
Equivalent
Less than or equal to
Not equal to

An else statement can be used as a type of shorthand to indicate anything besides what's being validated.

Find an example of code that includes a comparison or an else statement and paste it below.

Write a sentence or two describing what this code does for a non-technical audience.

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Statement logic

A biconditional is an “if and only if,” or “iff,” statement. These are similar to implications but more restrictive because biconditionals must be true whether read backward or forward.

That is, for one of the propositions to be true, the other must be true, and vice versa.

For example:
OrderStatus=InProgress if and only if the order is in the cart.

Describe a scenario within the software application that you write about where a biconditional statement might be useful.

Why is an implication statement insufficient for the scenario you identified?

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Statement logic

A negation is a “not” statement. According to the rules of negation, if z is true, not z is false. Similarly, if z is false, not z is true.

Negations might be written as !z (not z) and may be used as a way to handle all cases besides the positive case.

How would you define
OrderStatus !(InProgress)

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Boolean logic

Boolean logic is named after its creator, George Boole. It might be referred to casually as AND, OR, or NOT logic.

Standard records often employ Boolean logic. Can you cite some examples of records where you've seen it used recently?

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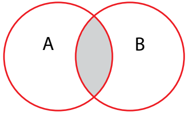
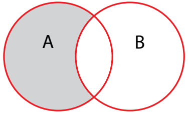
Boolean logic

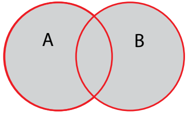
The graphic to the right illustrates the Boolean operators AND, NOT, and OR. The gray shaded area is included, while the white shaded area is excluded.



Admitted to the hospital (A) AND patient of Dr. Burke (B)



Admitted to the hospital (A) NOT patient of Dr. Burke (B)



Admitted to the hospital (A) OR patient of Dr. Burke (B)

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Faulty logic

Faulty logic refers to logic that is inaccurate or flawed in some way.

When code employs faulty logic, it is prone to bugs or unexpected behavior.

Software documentation can also employ faulty logic.

One indicator that software documentation logic is flawed is if it does not mirror the logic in the code being described.

Describe a time when you encountered software that you suspected to be flawed. Did you consider how the underlying logic might be faulty? What did you do when you found the problem?

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Truth tables

A truth table is a chart that lists all possible inputs and outputs for a logic statement.

Truth tables can be useful in your documentation to make sure you have considered all the possibilites and to verify that you understand the behavior of the software under all possible conditions.

The example to the right shows a truth table for the statement “A if and only if B.” For this statement to be true, either both A and B must be true or both A and B must be false.

A	B	A iff B
T	T	T
T	F	F
F	T	F
F	F	T

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Logic assignment

In this module, we've discussed a variety of introductory logic concepts, including the logic of language, statement logic, and Boolean logic. Now it's time to practice what you've learned.

Find a chapter in one of your product's setup and support guides that describes a topic such as profile or system definitions setup.

Read through the chapter and highlight any text you encounter that illustrates one of the logic concepts that we discussed. Annotate the text (using comments) to identify the type of logic and to label the different logic elements (using the red vocabulary terms from this module.

When you are finished, save a copy of your chapter, and then paste the file path below.

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References

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