

DNSC-24-AML-v1b

## Advanced Math Logic

Duy Nam Schlitz<sup>a\*</sup>

<sup>a</sup> A young boy who wants more., [duynamschlitzbusiness@gmail.com](mailto:duynamschlitzbusiness@gmail.com)

<sup>\*</sup> Corresponding author

### Abstract

11 additional symbols are included in the AML package version 1 in an effort to increase the number of mathematical notations that are available. These symbols are meant to be accepted and used in upcoming official releases, even though they are not yet formally standardized. The AML package aims to improve the expressiveness and clarity of mathematical expressions by offering distinctive, user-friendly symbols.

### Introduction to AML and all CMD

- The custom symbol for "if" is  $++$
- The custom symbol for "else if" is  $\nrightarrow$
- The custom symbol for "else" is  $\nabla$
- The custom symbol for "to" is  $\rightarrow$
- The custom symbol for "also" is  $\diamond$
- The custom symbol for "additional Content" is  $\Rightarrow$
- The custom symbol for "done" is  $\boxtimes$
- The custom symbol for "equal to statement" is  $\Leftrightarrow$
- The custom symbol for "true" is  $\perp$
- The custom symbol for "false" is  $\top$
- The custom symbol for "undefined" is  $\bot$

### 1. Example

$$++(\forall x \in \mathbb{N}, \exists y \in \mathbb{C}, k \neq 0) : (x+yk) = 0 \nabla x+yk \neq 0 \boxtimes$$
$$\Leftrightarrow ++(k=0) : (x+ky \neq 0) \nabla x+ky = 0 \boxtimes$$

### 2. How to use

#### 2.1 Basic Usage with Conditional Logic

The custom "if" symbol is used as follows:  $++(x > 0)$ . If the condition is not met, you can use the "else" symbol:  $\nabla(x \leq 0)$ . For a more complex condition, use the "else if" symbol:  $\nrightarrow(x = 0)$ .

#### 2.2 Using the "To" and "Also" Symbols

Given that  $x = 5$ , the next step is to apply the "to" symbol:  $\rightarrow f(x)$ . Additionally, we introduce the "also" symbol to represent a follow-up statement:  $\diamond g(x) = x^2$ .

#### 2.3 Complex Expressions Involving Multiple Symbols:

For all  $x \in \mathbb{N}$ , if  $x$  is positive, then  $++x > 0 \rightarrow \text{True}$ , otherwise  $\nabla x \leq 0 \rightarrow \text{False}$ . If  $x = 0$ , we apply  $\nrightarrow x = 0 \rightarrow \text{Undefined}$ .

In completely mathematical vision:

$$\mathbb{N} \Leftrightarrow ++(\forall x \in \mathbb{N} : x > 0) \rightarrow \perp \nrightarrow (x = 0) \rightarrow \bot \nabla (x \leq 0) \rightarrow \top \boxtimes.$$

#### 2.4 Using the "True" and "False" Symbols

In logical operations, the "true" symbol is denoted by  $\perp$ , while the "false" symbol is denoted by  $\top$ :

$$++(x > 0) \rightarrow \perp \nabla (x \leq 0) \rightarrow \top$$

#### 2.5 "Additional Content" Symbol in Context

If the value of  $x$  meets the condition, we add some additional content using the "additional content" symbol:  $\Rightarrow x' = 2x$ .

#### 2.6 End Symbol Usage

When the process is complete, we mark it as done with the "done" symbol:  $\boxtimes$ .

#### 2.7 Using Logical Equivalence

If the equation holds true for both sides, we use the "equalize to" symbol:  $\Leftrightarrow (x = y) \rightarrow f(x) = f(y)$ .

#### 2.8 Combining Multiple Symbols in a Complex Statement

$$++(a > b) \rightarrow f(a) > f(b) \nrightarrow (a = b) \rightarrow f(a) = f(b) \nabla \rightarrow \bot$$