Chapter 02 - Variables, Printing and Math

Chapter Introduction

Objectives

- Identify the most appropriate data type for a primitive variable.
- Declare variables of the correct type to represent primitive data.
- Change the value of a variable through the use of mathematical operations that are appropriate for the given variable type.

CTSA Standards

2-AP-11	Create clearly named variables that represent different data types and perform operations on their values. A variable is like a container with a name, in which the contents may change, but the name (identifier) does not. When planning and developing programs, students should decide when and how to declare and name new variables. Students should use naming conventions to improve program readability. Examples of operations include adding points to the score, combining user input with words to make a sentence, changing the size of a picture, or adding a name to a list of people.

Unreal Engine Documentation

See: https://docs.unrealengine.com/4.27/en-US/ProgrammingAndScripting/Blueprints/UserGuide/Variables/ for the official documentation on variables in UE.

The Project

Open the Chapter02 project. As you work through the lessons you'll be asked to open different levels in the project that are found in the "maps" folder. Please see "Chapter 01 - Introduction to Unreal Engine" for more information on using UE with this material.

Introduction

Variable names

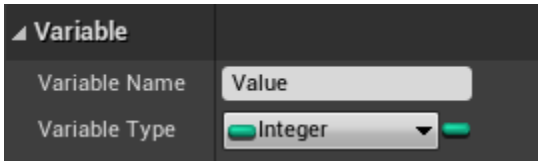
It's a good idea to name variables descriptively. For example "Score" is a good name for a variable that holds the value of the score of a game. Sometimes abbreviations are used. For example XP would be a good name for a variable that holds the value for a player's experience points in an RPG. There are rules for naming variables and most every language has a rule that doesn't appear in another language.

A good general rule of thumb is that variables can always consist of letters and no spaces. Some languages allow (even encourage) a $ as the first symbol of a variable name. UE allows this, but it isn't standard practice. In the past, programmers used a "?" as the first or last symbol in Boolean variables, but that practice has been largely abandoned.

With that said, it's a good idea to come up with a naming convention for variables and stick with it. There is an excellent Style Guide for UE at: https://github.com/Allar/ue5-style-guide

Variables

A variable is a place in memory that holds a value. By its very nature, the value stored in a variable *varies* - hence the name! This storage place lives for the lifespan of the object that has the variable.



Integer variable named Value

Types of variables

UE is a typed system. What this means is, all variables have a type associated with them. This limits what types of things a variable can hold. For example, an Integer can hold whole numbers, which are values without decimal places. If a variable needs to keep track of floating point numbers, its type must be declared as a Float. Some programming languages have a type Double as well as Float, UE does not.

Variables such as Booleans, Integers, Floats are “primitive” types. This means they are variables that are not objects (things that have methods). You can use the values of primitives in calculations, but they don’t have methods to perform actions on themselves or their data (this will make more sense later!).

Lessons

Chapter 02 - Lesson 01
Chapter 02 - Lesson 02 (not released)
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