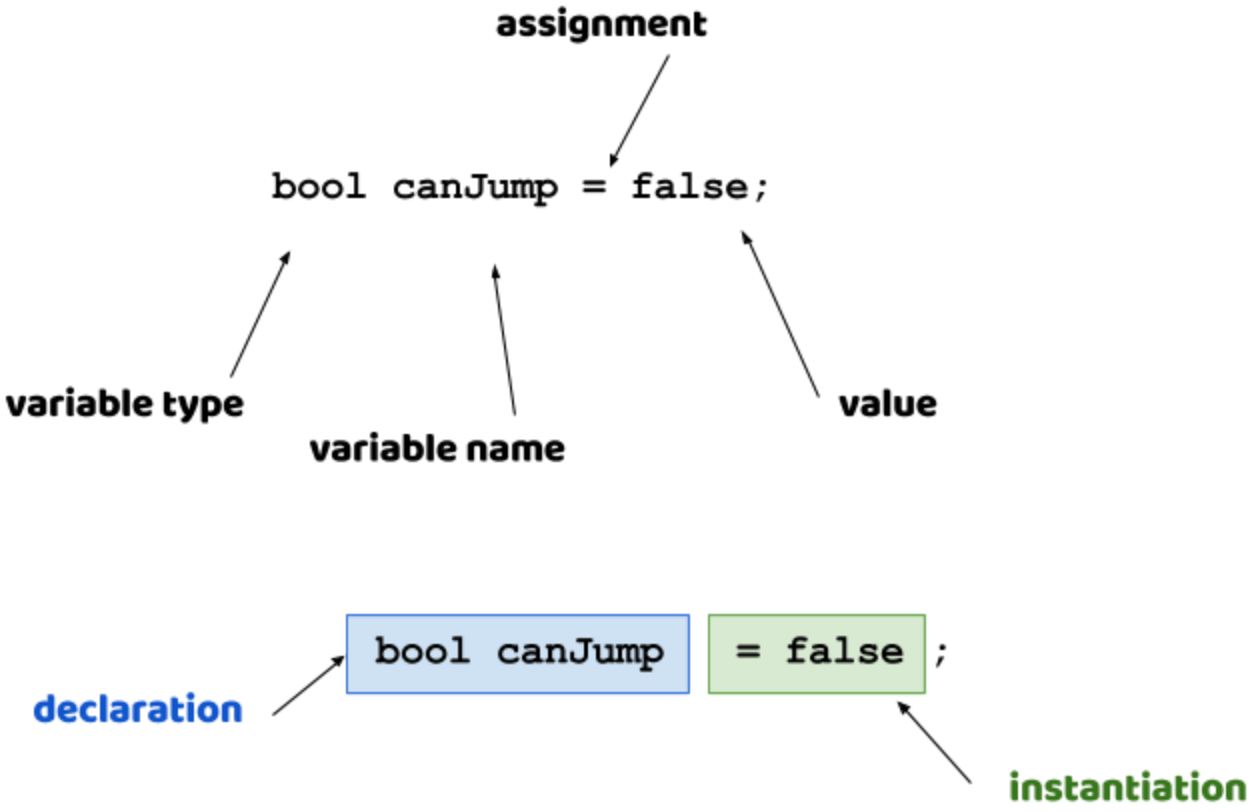
C# Basics: Variables

There are many languages a computer can speak, just like humans. C# is one such language and we will be learning how to speak C#. Since C# is a language it will follow the same conventions of having Nouns, Verbs and Events

Making Variables (Nouns)



Syntax

In English you have grammar rules i.e. can't say 'me and marlene' before the verb, has to be 'Marlene and I'. If you don't follow the grammar your english is incorrect and a person may not understand you, but sometimes are smart enough to figure out what you meant. Unfortunately computers are very dim-witted and if you make any small grammar mistake it WILL NOT know what you are trying to say. We call grammar in a programming language Syntax. So as we learn about programming language concepts, we will also learn its Syntax(Grammar)

Basic Syntax

In C# if you make a basic line of code it must end in a semicolon [;]. Why? because a computer cannot tell if you have finished your sentence unless you have put down a semicolon. Like a period '.' marks the end of a sentence in english.

In C# we call Nouns, Variables. Going forward we will call any nouns in programming - Variables.

Simple Variable Types

Just like we have different types of nouns (proper, common), we have different types of variables. Computers are very picky about making sure you tell them what type the variable is you want to talk about

Integer number

This is a type of number that is whole, like 1,-2,2000. But not 4.131!

```
int numOfCoins = 25;
```

Syntax: We use 'int' for the variable type

Float/Decimal number

These are your decimal or fractional numbers like 1.22, 2.131. 2 is also a float if we write it as 2.0. Thus integers can be floats/decimals but not all float/decimals can be integers!

```
float cameraSize = 11.42f;
```

Syntax: We use 'float' for the variable type, and if a value is a float type we put an f[<-bold this] in front of it. i.e. 25.2f vs 25.2

String

This is what we call any sequence of letters, we often put " " arond strings. i.e. "Maria", "Mario". "afsfaf" is also a string, it doesn't have to make sense as long is it is a bunch of letters it is a string.

```
string playerName = "Mario";
```

Syntax: We use 'string for the variable type, and the value must be surrounded by double quotations marks [Bold " "]. i.e. "Luigi" vs Luigi

Bool

Computers are big on logic, and knowing whether something is 'true' or 'false' is a big deal! Computers use this variable type so frequently we gave it a name, Bool!

Syntax: We use 'bool' for the variable type, and the value can only be **'true'** or **'false'**

Compound Variable Types

You can make your own types of variables in programming! For example you can make a structure with 2 integers, and you can call it a Pair! You will see lots of compound variable types in programming. Unity has a lot of its own compound variable types. Examples: Vector3, RigidBody, BoxCollider2D etc.

Variable Names

Whenever we talk about a variable, we need to name it so that we can refer to it later. So remember all variables have a name!

Declaring Variables

Declaration

To begin talking to the computer we tell it about the Variables we want to use, the name of the Variable and the Variable type. We call this process 'Declaring'. Let's declare a Variable:

```
int numOfDaysInWeek;
```

or

```
int numOfDaysInWeek = 7;
```

That line of code tells my computer that I declare the variable `numOfDaysInWeek`! Cool! Now we can use this variable for future talks. Now I will tell the computer to give it a value

Assigning a value

After declaring a variable, you can always assign/change the value of a variable any time you want. The syntax is to write the variable name put an equal sign after '=' after and then the value you want to assign and a semicolon to end

```
numOfDaysInWeek = 2;
```

```
numOfDaysInWeek = 6;
```

In C#

```
print numOfDaysInWeek;
```

Warning: We can't tell a computer to print that number if we didn't declare it before!

Incorrect Order:

```
print numOfDaysInWeek;
numOfDaysInWeek = 2;
```

Correct Order:

```
numOfDaysInWeek = 2;
print numOfDaysInWeek;
```