DEFINITION

data type

Posted by: Margaret Rouse WhatIs.com

A data type, in programming, is a classification that specifies which type of value a variable has and what type of mathematical, relational or logical operations can be applied to it without causing an error. A string, for example, is a data type that is used to classify text and an integer is a data type used to classify whole numbers.

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Data Type	Used for	Example
String	Alphanumeric characters	hello world, Alice, Bob123
Integer	Whole numbers	7, 12, 999
Float (floating point)	Number with a decimal point	3.15, 9.06, 00.13
Character	Encoding text numerically	97 (in ASCII, 97 is a lower case 'a')
Boolean	Representing logical values	TRUE, FALSE

The data type defines which operations can safely be performed to create, transform and use the variable in another computation. When a program language requires a variable to only be used in ways that respect its data type, that language is said to be *strongly typed*. This prevents errors, because

while it is logical to ask the computer to multiply a float by an integer (1.5 x 5), it is illogical to ask the computer to multiply a float by a string (1.5 x Alice). When a programming language allows a variable of one data type to be used as if it were a value of another data type, the language is said to be *weakly typed*.

Technically, the concept of a *strongly typed* or *weakly typed* programming language is a fallacy. In every programming language, all values of a variable have a static type -- but the type might be one whose values are classified into one or more classes. And while some classes specify how the data type's value will be compiled or interpreted, there are other classes whose values are not marked with their class until run-time. The extent to which a programming language discourages or prevents type error is known as *type safety*.

Margaret Rouse asks:

If the data type defines what operations can be performed, why do so many errors occur at run-time instead of when the code is compiled or interpreted?

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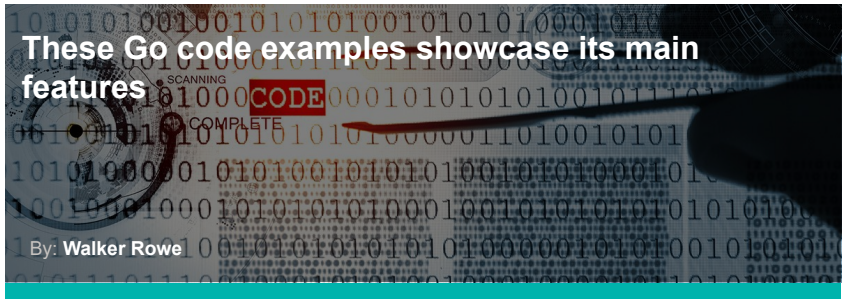
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[-] **Margaret Rouse** - 5 Apr 2005 12:15 PM

If the data type defines what operations can be performed, why do so many errors occur at run-time instead of when the code is compiled or interpreted?

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[-] **Radhapriya** - 28 Sep 2014 12:58 PM

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[-] **BlessKale** - 30 Dec 2016 7:43 AM

Well I would say this happens because its only during the run-time that each data type begin to interact with each other and then the impossible is detected. I hope am right.

Reply

[-] **AndyDavid** - 21 Jan 2019 7:11 AM

Hello. What is a real data type? with an example. Thanks.

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[-] **yeetyeeterson** - 7 Oct 2019 8:39 AM

no

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yeah mate

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[-] **Peepee123** - 26 May 2020 8:07 PM

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