Different types of data require different amounts of memory to store them. For instance, a number may be stored as 1 byte and just store whole numbers. A single character will only require 1 byte, but a string of 5 characters will need 5 bytes. The different types of data that can be stored are known as **data types**.

When **variables** or **constants** are created the computer needs to know what data types each of them are. Programming languages like C/C++/Java/C# expect the programmer to state which data type each variable will hold. Other languages, like Python, will assume what data type they should be using by the first value which is assigned to a variable or constant.

The following are data types that you can use.

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Data type	Explanation	Example values
Integer	An integer will store a whole number . Some	0
	languages let you even specify how many bytes	51
	will be taken up by the integer and therefore	29385
	how big the numbers that it stores can be.	-812
Real /	A real or floating point number is one that has a	145.28
Floating point	fractional component. It would be used to store	5.0
	the height of a student or the price of something	0.29300
	in pounds and pence.	-4.23
Boolean	A Boolean is a data type that stores two options	True
	that are either True or False , or in some	False
	languages 1 or 0.	
Character	A character is one single letter, number etc. It is	'b'
	important to remember that space is also a	'A'
	character. Single quotes normally tell a	181
	programming language that something is a	1 1
	character.	'£'
String	A string is a sequence of characters that are all	'Hello world!'
	stored together. It has a variable length and is	'Sam'
	used to store text. Languages will use double	'This is text. '
	quotes or single quotes around strings.	'4\$3£sdj'

Most modern languages won't allow you to store the wrong data type in a variable. For instance, if you create a variable to store a Boolean and then try to put an integer in it you will get a **type mismatch error**. For example:

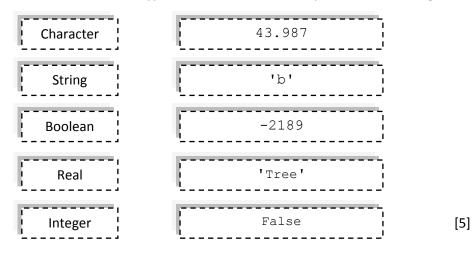
l	playAgain	←	True	
ļ	playAgain	←	0	

This line of code would cause an error as playAgain would have been created as a Boolean and you are now trying to store an integer in it.

Data Types - Questions

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1. Match the data types on the left to the example values on the right.



2. For each of the situations on the left, tick whether you would store them in a variable or constant. Tick **once** per row.

Explanation and value	Constant	Variable	
Used to store a score in a game			
Used to store the value of pi			
(3.14159)			
The strength of an enemy character			
which changes as they are hurt			
The value of gravity (which is always			
9.8)			[4]

3. What is another name for a real number?

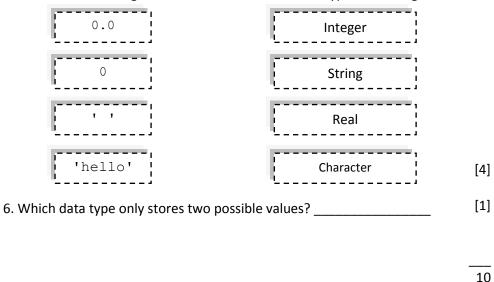
4. In a programming language you try to compile the following program that will initialise and then change a password:

username \leftarrow	'peterm'
password \leftarrow	'3845'
password \leftarrow	8392
レ	

The compiler fails to compile, giving you a syntax error.

- [1] a) What is the \leftarrow operator called in each line of code? b) What data type is the username in? _____c) What data type is the password originally in? _____ [1] [1] [1]
- d) What error will the compiler give? ______
- e) Rewrite the last line of code so that it will compile.

5. Match the following values on the left to their data types on the right.



[1]

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[1]