1. In the below elements which of them are values or an expression? eg:- values can be integer or string and expressions will be mathematical operators.

\* (expression)

'hello' (value)

-87.8 (value)

- (expression)

/ (expression)

* (expression)

6 (value)

2. What is the difference between string and variable?

Answer

A variable is a named storage location in a computer's memory that holds a value. It is used to store and manipulate data within python. Variables can hold different types of data, such as numbers, characters, and strings.

A string, on the other hand, is a specific type of data that represents a sequence of characters. It is often used to store and manipulate text-based data, such as names, sentences, or even entire documents.

For example in the below line :

name = “John”

In this case, name is a variable that holds a string value "John".

3. Describe three different data types.

Answer

Three different data types are as follows :

1. Integer (int): Integers are used to represent whole numbers without any fractional or decimal part. They can be positive, negative, or zero. For example, 1, -5, and 1000 are integers.
2. Floating-Point (float): Floating-point numbers are used to represent numbers with a fractional part. They can store real numbers, including both whole numbers and fractions. Examples of floating-point numbers are 3.14, -0.5, and 1.23456789.
3. String: A string is a sequence of characters. It is used to represent text or a collection of symbols. Strings are usually enclosed in quotation marks, either single ('') or double (""). For example, "Hello, World!" and "OpenAI" are strings.

4. What is an expression made up of? What do all expressions do?

Answer

An expression is a combination of values, variables, operators, and functions that can be evaluated to produce a result. It represents a computation or a calculation in programming or mathematics.

The primary purpose of an expression is to produce a value. When an expression is evaluated, it is replaced with its resulting value. Expressions can be used in various contexts, such as assigning a value to a variable, passing arguments to a function, or making decisions based on conditions (using conditional expressions).

5. This assignment statements, like spam = 10. What is the difference between an expression and a statement?

Answer

An expression is a combination of values, variables, operators, and function calls that evaluates to a single value. It can be as simple as a literal value (e.g., 5 or "hello") or more complex, involving arithmetic operations, comparisons, or function invocations. Expressions are typically used to compute values or produce results.

On the other hand, a statement is a complete instruction or action that performs a specific task. Statements do not produce a value, but they execute a sequence of operations, control the flow of a program, or modify the state of variables or objects.

Statements are used to create algorithms, control the execution flow, and modify program state, while expressions are used to compute values and produce results within those statements.

6. After running the following code, what does the variable bacon contain?

bacon = 22

bacon + 1

Answer  
The variable ‘bacon’ contains value 22, however ‘bacon +1’ will obviously give value 23.

7. What should the values of the following two terms be?

'spam' + 'spamspam'

'spam' \* 3

Answer

The value for both the terms will be the same.

8. Why is eggs a valid variable name while 100 is invalid?

Answer

Its because a variable name cannot start with a number.

9. What three functions can be used to get the integer, floating-point number, or string version of a value?

Answer

To obtain the integer, floating-point number, or string version of a value in various programming languages, you can typically use the following functions:

(i) Integer Conversion:

In Python: int()

In JavaScript: parseInt()

In C++: stoi() (string to integer)

(ii) Floating-Point Conversion:

In Python: float()

In JavaScript: parseFloat()

In C++: stof() (string to float)

(iii) String Conversion:

In Python: str()

In JavaScript: toString()

In C++: to\_string()

10. Why does this expression cause an error? How can you fix it?

'I have eaten ' + 99 + ' burritos.'

Answer

This expression causes error because 99 is an integer whereas the rest two elements are strings. We cannot concatenate integers and strings together.