Solutions

1. Values: -87.8, 6, ‘hello’
   Expressions: *, -, /, +

2. A string is a sequence of characters, such as letters, numbers, and symbols, that is treated as a single data item in computer programming. In programming languages like Python, a string is typically enclosed in quotation marks, either single or double quotes. For example, "Hello, world!" and '12345' are both strings.

   On the other hand, a variable is a named storage location in a program that holds a value that can be changed during the program's execution. A variable can hold different types of data, such as strings, numbers, or Boolean values, depending on the programming language and the data type declared for the variable.

3. **1. Integer**: An integer is a numeric data type that represents whole numbers, both positive and negative. It is used to store values that do not have decimal points. In programming languages like Python, Java, and C++, integers are represented by the keyword "int". Examples of integers include -3, 0, and 123.

   2. String: A string is a sequence of characters, such as letters, numbers, and symbols, that is treated as a single data item in computer programming. In programming languages like Python and Java, strings are represented by enclosing the characters in single or double quotes. Examples of strings include "Hello, world!", "12345", and "Python".

   3. Boolean: A Boolean data type represents only two values, true or false. It is often used in conditional statements and logical operations. In programming languages like Python and Java, Booleans are represented by the keywords "True" and "False". Examples of Boolean values include True, False, and the results of logical operations like (5 > 2) which evaluates to True.

4. In mathematics, an expression is a combination of numbers, variables, and mathematical operations (such as addition, subtraction, multiplication, division, and exponentiation) that are written in a specific order and follow certain rules of precedence.

   For example, "3x + 5" is an expression that contains the variable x, the constant 3, and the constant 5, and the operation of addition.

   All expressions, regardless of their complexity, serve to represent a value or set of values. The value of an expression can be determined by evaluating it using a set of rules that follow the order of operations.

5. An expression is a combination of values and operators that produces a value when evaluated, whereas a statement is a complete line of code that performs an action.

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7. The first term 'spam' + 'spamspam' will concatenate (join) two strings, resulting in the string 'spamspamspam'.
   The second term 'spam' * 3 will repeat the string 'spam' three times, resulting in the string 'spamspamspam'.

8. In programming, variable names are used to refer to a value stored in memory. In Python, variable names must follow certain rules in order to be valid. Here are some rules for variable names in Python:

   - Variable names must start with a letter or underscore character (_).
   - Variable names can only contain letters, numbers, and underscores.
   - Variable names are case-sensitive (e.g., spam and SPAM are different variables).
   - With these rules in mind, eggs are a valid variable name because it starts with a letter and only contains letters.

   On the other hand, 100 is an invalid variable name because it starts with a number, which violates the first rule. However, variable names can contain numbers as long as they don't start with a number. For example, spam123 is a valid variable name because it starts with a letter and contains letters and numbers.

9.
   1. int() - This function can be used to convert a value to an integer. If the value is a string, it must be a valid integer string, otherwise a ValueError will be raised.

   2. float() - This function can be used to convert a value to a floating-point number. If the value is a string, it must be a valid floating-point string, otherwise a ValueError will be raised.

   3. str() - This function can be used to convert a value to a string.

10. The expression 'I have eaten ' + 99 + ' burritos.' causes an error because it is trying to concatenate a string with an integer, which is not allowed in Python.

    To fix this error, you can convert the integer to a string using the str() function before concatenating it with the other strings.

    'I have eaten ' + str(99) + ' burritos.'