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.

\*

'hello'

-87.8

-

/

6

**Answer:**

\*: Mathematical operator (expression)

'hello' : String value

-87.8 : Float value

- : Mathematical operator (expression)

/ : Mathematical operator (expression)

+ : Mathematical operator (expression)

6 : Integer value

2. What is the difference between string and variable?

**Answer:**

A string is a type of data that represents a sequence of characters, such as "hello" or "12345". It is a specific data type that is used to store text-based information. In programming, strings are typically enclosed in quotation marks, such as single quotes ('hello') or double quotes ("hello").

On the other hand, a variable is a container that holds a value or a reference to a value. It is a named storage location in the computer's memory that can store different types of data, including strings. A variable can be assigned a value, such as a string, and this value can be changed as the program runs.

3. Describe three different data types.

**Answer:**

1.Integer: An integer data type is used to store whole numbers (positive or negative) without any decimal points. Examples of integers include 1, 2, -3, 0, etc.

2.Float: A float (or floating-point) data type is used to store real numbers (positive or negative) with a fractional component, such as 3.14, -2.5, 0.1, etc. The term "floating point" refers to the fact that the decimal point can "float" to represent numbers of different magnitudes. Floats are typically stored in a fixed number of bits, such as 32 bits or 64 bits, and the precision of the fraction can vary based on the number of bits used.

3.String: A string data type is used to store text-based information, such as names, addresses, and other textual data. Strings are typically enclosed in quotation marks, such as "hello", "world", "1234", etc. They can also contain special characters, such as spaces, punctuation, and other symbols. In many programming languages, strings are treated as arrays of characters and can be manipulated using a variety of built-in functions and operations.

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

In programming, an expression is a combination of values, variables, operators, and function calls that can be evaluated to produce a result. Expressions can be simple or complex, and they can be used to perform calculations, make comparisons, and manipulate data.

An expression is made up of operands and operators. Operands are the values or variables that the operator acts upon, while operators are symbols or keywords that perform an operation on the operands. For example, in the expression "2 + 3", the operands are the values 2 and 3, while the operator is the plus symbol (+).

5. This assignment statements, like spam = 10. What is the difference between an expression and a statement?  
  
**Answer:**   
  
spam = 10 is a statement that assigns the value 10 to the variable spam. Statements can also include control flow constructs such as if, while, and for loops.  
  
the main difference between an expression and a statement is that an expression is a single unit of computation that produces a value, while a statement is a complete line of code that performs a specific action.

In summary, an expression is a combination of values and operators that produces a value, while a statement is a complete line of code that performs an action, such as assigning a value to a variable or calling a function.

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

bacon = 22

bacon + 1  
  
**Answer:**  
bacon = 22

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

'spam' + 'spamspam'

'spam' \* 3  
  
**Answer:**

‘spamspamspam’

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

Because variable names cannot begin with a number

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

**Answer:**

The int(), float(), and str() functions will evaluate to the integer, floating-point number, and string versions of the value passed to them.

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

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

**Answer:**

The expression 'I have eaten ' + 99 + ' burritos.' will cause a TypeError because it is trying to concatenate a string ('I have eaten ') with an integer (99) using the + operator. In Python, you cannot concatenate a string and an integer directly.

To fix this error, you can convert the integer to a string using the str() function before concatenating it with the other strings. Here is the corrected expression:  
  
'I have eaten ' + str(99) + ' burritos.'