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:**

'hello' is a value (string).

-87.8 is a value (floating-point number).

\*, -, /, + are expressions (mathematical operators).

6 is a value (integer).

1. **What is the difference between string and variable?**

**Answer:** A **string** is a **sequence of characters** (e.g. "hello world"). A string is a **constant value,** meaning its value cannot be changed once it has been defined.  
  
A **variable** is a **named storage location** that holds a value. Unlike a string, the value stored in a variable can be changed during the execution of a program. A variable is used to store a value that may change during the execution of a program.

In summary:

* Strings are constant values
* Variables are named storage locations that hold values that may change

1. **Describe three different data types.**

**Answer:**

1. Numeric data types: These data types represent numeric values such as integers and floating-point numbers. For example, an integer data type can store the value 42, while a floating-point number data type can store the value 3.14.
2. String data type: This data type represents a sequence of characters. For example, "Hello, World" is a string value. String values are usually enclosed in quotation marks in most programming languages.
3. Boolean data type: This data type represents a binary value, either true or false. It's commonly used in decision-making statements to determine the flow of a program. For example, you can use a boolean variable to store the result of a comparison, like (3 > 2) which evaluates to true.
4. **What is an expression made up of? What do all expressions do?**

**Answer:** An expression is a combination of values, variables, and operators that yields a result. An expression can be as simple as a single number or as complex as a combination of mathematical operations, function calls, and logical comparisons.

All expressions, regardless of their complexity, perform a calculation and produce a result. The result of an expression can be used as an input to another expression, assigned to a variable, or returned as the result of a function.

For example, consider the expression 2 + 3. This expression combines the values 2 and 3 using the addition operator (+) and evaluates to the result 5. Another example of an expression is x > 10, where x is a variable. This expression performs a comparison between the value of the variable x and the value 10, and evaluates to either true or false.

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

**Answer:** Expressions are used to produce values, while statements are used to give instructions to the computer. An assignment statement is a specific type of statement that assigns a value to a variable.

1. **After running the following code, what does the variable bacon contain?**  
   **bacon = 22**  
   **bacon + 1**

**Answer:** 23

1. **What should the values of the following two terms be?**  
   **'spam' + 'spamspam'**  
   **'spam' \* 3**

**Answer:** ‘spamspamspam’

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

**Answer:** In Python, variable names must start with a letter or an underscore and can contain letters, numbers, and underscores. However, they cannot start with a number.

eggs is a valid variable name because it starts with a letter. On the other hand, 100 is an invalid variable name because it starts with a number.

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

**Answer:** In Python, the following three functions can be used to convert a value to its integer, floating-point number, or string representation:

1. int() - This function takes a value as an input and returns its integer representation. For example: int(3.14) returns 3.
2. float() - This function takes a value as an input and returns its floating-point number representation. For example: float(3) returns 3.0.
3. str() - This function takes a value as an input and returns its string representation. For example: str(3.14) returns "3.14".
4. **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.' causes an error because we are trying to concatenate a string and an integer using the + operator, but the + operator only works with two operands of the same type.

The corrected expression would look like this: 'I have eaten ' + str(99) + ' burritos.'