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.

\* - multiplaction oprater

'hello' - String

-87.8 – float value

- substraction oprater

/ - division oprater

* - push oprater

6 - intager value

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2. What is the difference between string and variable?

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| String | Variable |
| * A string is a sequence of characters enclosed in quotes (single, double, or triple). | * A variable is a symbolic name that stores data or references a value. It acts as a container for values, which can be of different types, such as integers, floats, strings, etc. |
| * **Example**: "hello", 'world' | * **Example**: name = "Alice", age = 30 |
| * **Usage**: Strings are used to represent text. They can include letters, numbers, symbols, and spaces. | * **Usage**: Variables are used to store data that can be used and manipulated throughout a program. They can be assigned different types of values during the program's execution. |
| * **Immutable**: In many programming languages, strings are immutable, meaning once they are created, they cannot be changed. | * **Mutable/Immutable**: Depending on the data type stored in a variable, it can be mutable (changeable) or immutable (unchangeable). |

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3. Describe three different data types.

### 1. Integer:

* **Definition**: An integer is a data type that represents whole numbers without a fractional component.
* **Example**: -3, 0, 42
* **Usage**: Integers are used for counting, indexing, and other operations that require whole numbers.

### 2. String:

* **Definition**: A string is a sequence of characters (letters, numbers, symbols, and spaces) enclosed in quotes.
* **Example**: "hello", 'world', "12345"
* **Usage**: Strings are used to represent text. They can be manipulated through operations such as concatenation, slicing, and formatting.

### 3. List (Array in some languages):

* **Definition**: A list is an ordered collection of items (elements) that can be of different data types. Lists are often dynamic, meaning they can grow and shrink in size.
* **Example**: [1, 2, 3, 4, 5], ["apple", "banana", "cherry"], [1, "hello", 3.14]
* **Usage**: Lists are used to store multiple items in a single variable. They are useful for collections of related data that need to be accessed by index.

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

An expression is made up of: **Operands**, Operators, **Parentheses**, **Function Calls**

All expressions evaluate to a value. This means that when an expression is executed, it produces a single result. The process of evaluating an expression involves computing the value represented by the expression based on the operators and operands involved.

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

-> A statement is a complete line of code that performs an action. Statements can include expressions but do not necessarily evaluate to a value.

To execute an action, which can include variable assignments, control flow operations (like loops and conditionals), function definitions, and more.

An expression is a combination of values, variables, operators, and function calls that can be evaluated to produce a value.

To compute and return a value.

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

bacon = 22

bacon + 1

bacon = 22 bacon = bacon + 1

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

'spam' + 'spamspam' => spamspamspam

'spam' \* 3 => spamspamspam

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

eggs is a valid variable name because it starts with a letter and follows the rules for variable naming (letters, digits, and underscores, but not starting with a digit). 100 is invalid because variable names cannot start with a digit.

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

The three functions that can be used to convert a value to an integer, floating-point number, or string are:

1. \*\*`int()`\*\*: Converts a value to an integer.

- Example: `int("42")` converts the string `"42"` to the integer `42`.

2. \*\*`float()`\*\*: Converts a value to a floating-point number.

- Example: `float("3.14")` converts the string `"3.14"` to the float `3.14`.

3. \*\*`str()`\*\*: Converts a value to a string.

- Example: `str(42)` converts the integer `42` to the string `"42"`.

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

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

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

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