Full Stack Data Science Masters – Assignment 1

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

\*

'hello'

-87.8

-

/

+   
  
6

Answer 1: In the given elements:

Values: 'hello', -87.8, 6

Expressions: \*, -, /, +

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2. What is the difference between string and variable?

Answer 2: Difference between a string and a variable:

String: In programming, a string is a sequence of characters enclosed in quotes (either single or double). It represents textual data and can include letters, numbers, symbols, or spaces. Example: 'hello', "world".

Variable: A variable is a named storage location in memory that holds a value. It can store different types of data, including strings. Variables are used to store and manipulate data during program execution. Example: name = “robin”, here name is the variable which stores the string value “robin”.

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3. Describe three different data types.

Answer 3:

Integer: It represents whole numbers without decimal points. For example: 5, -10, 0.

Float: It represents numbers with decimal points. For example: 3.14, -2.5, 0.0.

String: It represents a sequence of characters. For example: "hello", 'world', "123".

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

Answer 4: An expression is made up of operators and operands. Operators are symbols that perform specific operations, and operands are the values or variables on which the operators act. Expressions combine these elements to produce a resulting value.

All expressions evaluate to a value, which can be a number, a string, a boolean, or any other data type depending on the operators and operands involved.

Example:

```

x = 5

y = 3

result = x + y \* 2

```

Here the expression `x + y \* 2` is made up of the following:

- Operands: `x` and `y` are variables.

- Operators: `+` and `\*` are the addition and multiplication operators, respectively.

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

Answer 5:

Expression: An expression is a combination of values, variables, and operators that can be evaluated to produce a value. It represents a computation or calculation. For example: 2 + 3, x \* y.

Statement: A statement is a complete instruction or command in a programming language that performs an action. It can include expressions but also controls the flow of execution. For example: assignment statements, loops, conditionals. The statement "spam = 10" assigns the value 10 to the variable spam.

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

bacon = 22

bacon + 1

Answer 6: The variable "bacon" will contain the value 22. The expression "bacon + 1" adds 1 to the current value of bacon (which is 22), but it does not modify the variable itself (to modify it should be bacon = bacon + 1).

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

'spam' + 'spamspam'

'spam' \* 3

Answer 7:

'spam' + 'spamspam' = 'spamspamspam'

'spam' \* 3 = 'spamspamspam'

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

Answer 8: As per python rules, variables cannot start with a number and should not be a reserved keyword. Since "eggs" starts with a letter, it is a valid variable name. However, "100" starts with a number, which is not allowed as the first character of a variable name.

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

Answer 9: Three functions for data type conversion:

* int (): Converts a value to an integer data type.
* float(): Converts a value to a floating-point (decimal) number.
* str(): Converts a value to a string representation.

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

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

Answer 10: The expression causes an error because it's attempting to concatenate a string ('I have eaten ') with an integer (99) and another string (' burritos.'). In Python, we cannot directly concatenate different data types together. To fix it, we can convert the integer to a string using the str() function. Example: 'I have eaten ' + str(99) + ' burritos.'