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.

* \* :- Expression: This mathematical operator is use to multiple two numbers example: 2\*2=4
* 'hello' :- Value: This is a string value named Hello, In Python strings needs to be in ‘Hello’(single quotation marks) or “Hello”( double quotation marks)
* -87.8 :- Value: This is a Negative numerical value, Numerical value can be Positive, Negative, float or integer.
* - :- Expression: This mathematical operator is use to subtract two numbers example: 2-1=1
* / :- Expression: This mathematical operator is use to divide two numbers example: 10/5=2
* + :- Expression: This mathematical operator is use to add two numbers example: 2+2=4
* 6 :- Value: This is a Positive numerical value, Numerical value can be Positive, Negative, float or integer.

2. What is the difference between string and variable?

* String is a Data Type but Variable can store Data type init.

example:- “X” in this case “X” is String who’s data type is String, X={“key1”:1,”key2”:2} in this case X is variable which is storing Dictionary and the data type of X is Dict.

3. Describe three different data types.

* Numerical:
  + Integer: All Positive and Negative numbers without fraction or decibels.
  + Float: Real number with floating point or decimal point.
  + Complex number: Complex number is combination of real number and imaginary number
* Sequence type:
  + String: string is a collection of one or more characters put in a single quote, double-quote or triple quote.
  + List: List is order collection of data of different data types.
  + Tuple: List and Tuple are same but there is only one difference that you modify list but can’t modify Tuple.
* Set: set is a collection of unique data. Set is iterable and mutable.
* Boolean: Data type with one of the two built-in value as (True and False) or (0 and 1).
* Dictionary: Dictionary use for store data values like a map, which unlike other Data Types that hold only single value as an element, Dictionary holds “key”: value pair.

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

* Expression: - An expression is a combination of operators and operands that is interpreted to produce some other value.

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| **Logical Operator** | **Syntax** | **Functioning** |
| and | P and Q | It returns true if both P and Q are true otherwise returns false |
| or | P or Q | It returns true if at least one of P and Q is true |
| not | not P | It returns true if condition P is false |

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| --- | --- | --- |
| **Arithmetic**  **Operators** | **Syntax** | **Functioning** |
| + | x + y | Addition |
| – | x – y | Subtraction |
| \* | x \* y | Multiplication |
| / | x / y | Division |
| // | x // y | Quotient |
| % | x % y | Remainder |
| \*\* | x \*\* y | Exponentiation |

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

|  |  |
| --- | --- |
| **Expression** | **Statement** |
| An expression evaluates to a value | A statement executes something |
| The evaluation of a statement does not changes state | The execution of a statement changes state |
| Evaluation of an expression always Produces or returns a result value. | Execution of a statement may or may not produces or displays a result value, it only does whatever the statement says. |
| Every expression can’t be a statement. | Every statement can be an expression. |
| Example: a+16  Output = 20 | Example: x = 3 print(x) Output: 3 |

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

* Bacon=22
* Bacon+1
* Output=23

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

* ‘spam’+’spamspam’
  + Output=’spamspamspam’
* ‘spam’\*3
  + Output=’spamspamspam’

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

* Variable name 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?

* Int()
* Float()
* Str()

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

* “I have eaten” + 99 + “Burritos.”
* Concatenation: - Concatenation can be done between two string and multiple string values. In above case 99 represent integer so it cannot concatenate with string.
* Solution: - To solve this problem we need to enter 99 as a string not as Integer.
* “I have eaten” + “99” + “Burritos.”