

1) what are the data types in python? explain.

A) Every value in python has a datatype. Since everything is an object in python programming datatypes are actually classes and variables are instance of these classes.

There are various data types in python. Five of the important data types are listed below.

a) Numeric.

A numeric value is any representation of data which has a numeric value. Python identifies 3 types of numbers:

- i) Integer: It includes positive or negative whole numbers.
- ii) Float: It includes any real number with a floating point representation in which a fractional component.
- iii) Complex number: It includes the combination of a real number and imaginary component represented as $x+yj$ where x and y are real numbers and value of j is -1 .

b) Boolean.

Data with one of two built-in values True or False. In this 'T' and 'F' are of upper case. true and false are not valid and python will throw an error for them.

c) Sequence type.

A sequence is an ordered collection of similar or different data types. Python has following built-in sequence data types.

- i) String: A string value is a collection of one or more characters put in single, double or triple quotes.
- ii) List: A list object is an ordered collection of one or more data items, not necessarily of the same type, put in square brackets.
- iii) Tuple: A tuple object is an ordered collection of one or more data items, not necessarily of the same type, put in parentheses.

d) Dictionary.

A dictionary object is an unordered collection of data in a key: value pair form. A collection of such pair is enclosed in curly brackets

ex: {1: "Steve", 2: "Bill", 3: "Ram", 4: "Farah"}

2. Briefly explain history of python.

A python is an interpreted high-level, general-purpose programming language created by "Guido van Rossum" and first released in 1991. Python's design philosophy emphasizes code readability with its notable use of significant white space. It's language constructs and object oriented approach aim to help programmers write clear, logical code for small and large-scale projects.

Python is dynamically typed and garbage-collected. It supports multiple programming paradigms, including structured object-oriented and functional programming. Python is often described as a "batteries included" language due to its comprehensive standard library. Python was conceived in the late 1980's as a successor to the ABC language. Python 2.0, released in 2000, introduced features like list comprehensions and a garbage collection system with reference counting. Python 3.0 released in 2008 was a major revision of the language, which is not completely backward-compatible and many of the python 2 codes doesn't run unmodified on python 3. The python 2 language was officially discontinued in 2020 and python 2.7.18 is the last python 2.7 released and therefore last python 2 released. No more security patches or other improvement will be released for it. With python 2's end-of-life, only python 3.5.x and later are supported. Python interpreters are available for many operating systems. A global community of programmers develops and maintain python, an open source reference.

implementation. A non-profit organization the Python software foundation manages and direct the resources for python and python development.

3. Explain the all the operators in python.

A. operators are special symbols in python that carry out arithmetic or logical computations. The value that operator operates on is called operand.

a) Arithmetic operators:

Arithmetic operators are used to perform mathematical operators like $+$, $-$, $*$, $/$, etc.

operator	meaning	example
$+$	2 operands (or) unary plus	$x + y$
$-$	retracts right operand from the left (or) unary minus	$x - y$
$*$	multiplies 2 operands	$x * y$
$/$	divides left operand by the right one.	x / y
$\%(modules)$	is the remainder of division of the left operand by right	$x \% y$
$//(floor division)$	division that results into whole number adjusted to the left in number line.	$x // y$
$**$	operand raised to the power of right operand	$x ** y$

b) comparison operators:

comparison operators are used to compare values. It return either True or false according to the condition.

operator	meaning	example
>	grater than - True if left operand is grater than the right	$x > y$
<	True - True if left operand is less than the right	$x < y$
==	True if both operands are equal	$x == y$
!=	True if both operands are not equal	$x != y$
>=	True - left operand is grater than or equal to the right	$x >= y$
<=	True if left operand is less than or equal to the right	$x <= y$

c) logical operators.

logical operators are the and, or, not operators.

And	True if both the operators are	$x \text{ and } y$
or	True if either of the operand is true.	$x \text{ or } y$
not	True if operand is false.	not x

d) bitwise operators:

operators	meaning	example
&	Bitwise And	$x \& y = 0$
	Bitwise OR	$x y = 14$
~	Bitwise NOT	$x \sim = -11$

a) Integrated.

it can easily be integrated with the language.
like C, C++, Java, etc - -

5) Justify why python is an interactive interpreted language.
A) Unlike C/C++ etc. python is an interactive object oriented language. By interpreted is meant that each time a program is for error and then interprets the instruction into machine-readable byte code.

An interpreter is a translator in computer language which translates the given code into by-line in machine-readable byte codes and if any error is encountered it stops the translation until the error is fixed. It simply returns the " >>> " prompt or the corresponding output of the statement if appropriate and returns error for incorrect statements.

In this way if you have any doubts like whether the syntax is correct or the module you are importing exists or anything like that you can be sure within seconds using python's interactive mode.