1. what the data types in python? Explain

A) 1. Numbers
   2. String
   3. List
   4. Tuple
   5. Dictionary

1) Numbers:- Number store numeric value.
python supports 4 types of numeric data

1. int (signed integers like 10, 2, 29 etc)

2. long (long integers used for a higher range of values like 9080908 00L etc)

3. float [It is used to store floating point numbers like 1·9, 9.9002 etc)

4. Complex (complex numbers like 2+14i)

2) String:- The string can be defined as the sequence of characters represented in the quotation marks. In python we use single, double or triple quotes to define a string

   Eg:- "hello world"

3) List:- List are similar to arrays in c. However, The list contain data of different types. The items stored in the list are seperated with a comma and enclosed with in the square brackets [ ]

4) Tuple:- A tuple is similar to the list in many ways. like lists, Tuple also contain the collection of the items of different data types - The items of tuple are seperated with a comma (,) and enclosed in the parenthesis ( )

Eg: t = ("hi", "python", 2)

    print (t[1:]);

    Olp: ('python', 2)

5) Dictionary:- Dictionary is an ordered set of a key-value pair of items. It is like an associative array. Key can hold any primitive data type whereas value is an arbitrary python object.

    Eg:- d = {1: 'Jimmy', 2: 'Alex', 3: Johny};

    print ("1st name is " + d[1]);

    Olp:- 1st name is jimmy

**2)** Briefly explain history of python?

**A)** Python is a widely used general-purpose high-level Programming language. It was initially designed by Guid. Van Rossum in 1991 and developed by python software Foundation. It was mainly developed for emphasis on code readability, and its syntax allows programmers to express concepts in fewer lines of code. In 1994, Python 1.0 was released with new features like; lamda, map, filter, and reduce. python 2.0 added new features like: list, comprehensions, garbage collection system. On december 3, 2008 python 3.0 was released. It was designed to rectify fundamental flaw of the language.

**3)** Explain all the operators in python?

**A)** Operators in python:-

1. Arithmetic Operators: Arithmetic operators are used to perform mathematical operations like addition, subtraction, multiplication and division

| Operator | Description | Syntax |
|----------|-------------|--------|
| + | Addition | $x+y$ |
| - | Subtraction | $x-y$ |
| * | Multiplication | $x*y$ |
| / | Division | $x/y$ |
| % | Modulus | $x\%y$ |
| // | Floor division | $x//y$ |
| ** | Exponentiation | $x**y$ |

2. **Relational Operators:-** Relational operators compares the values. It either returns True or False according to the condition.

| Operator | Description | Syntax Example |
|---|---|---|
| == | Equal | $x==y$ |
| != | not equal | $x!=y$ |
| > | Greater than | $x>y$ |
| < | Less than | $x<y$ |
| >= | Greater than or equal to | $x>=y$ |
| <= | Less than or equal to | $x<=y$ |

3. **Logical Operators :** Logical operators perform Logical AND, Logical OR and Logical NOT operations

| Operator | Description | Exta Syntax |
|---|---|---|
| AND | Logical AND: True if both the operands are true | $x$ and $y$. |
| OR | Logical OR: True if either of the operands is true | $x$ or $y$. |
| not | Logical NOT: True if operand is false | not $x$. |

## 4. Bitwise Operators:

Bitwise Operators acts on bits and Performs bit by bit operation.

| Operator | Description | Syntax |
|----------|-------------|--------|
| & | Bitwise AND | $x \& y$ |
| \| | Bitwise OR | $x \| y$ |
| ~ | Bitwise NOT | $\sim x$ |
| ^ | Bitwise XOR | $x \wedge y$ |
| >> | Bitwise right Shift $x \nabla$ | $x >>$ |
| | Bitwise left shift | $x .$ |

## 5. Assignment Operators:

Assignment operators are used to assign values to the variables.

| Operator | Description Example | Syntax Same As |
|----------|---------------------|----------------|
| = | $x = 5$ | $x = 5$ |
| += | $x + = 3$ | $x = x + 3$ |
| -= | $x - = 3$ | $x = x - 3$ |
| *= | $x* = 3$ | $x = x * 3$ |
| /= | $x / = 3$ | $x = x / 3$ |
| %= | $x \% = 3$ | $x = x \% 3$ |
| >>= | $x >> = 3$ | $x = x >> 3$ |
| <<= | $x << = 3$ | $x = x << 3$ |

6. Special Operators: There are some special type of operators like -

Identity Operators - is and is not are the identity operators both are used to check if two values are located on the same part of the memory. Two variables that are equal does not imply that they are identical

is     True if the operands are identical

is not     True if the Operands are not identical

Membership operators - in and not in are the membership operators, used to test whether a value or Variable is in a Sequence.

in     True if value is found in sequence.

not in     True if a value is not found in sequence.

④ Explain the features of python.

(1) Easy to learn and use.
Python is easy to learn and use; It is developer-friendly and high level programming language.

(2) Expressive language:
It means that is more understandable and readable

(3) Interpreted language
Interpreter executes the code line by line at a time. This makes debugging easy and thus.

Suitable for beginners.

**(4) Cross-platform language:-**

It can run equally on different platforms such as windows, linux, unix etc. So we can say python is a portable language.

**(5) Free and Open source**

It is freely available at official web address source. Code is also available i.e.it is Open source

**(6) Object-oriented language**

It supports object oriented language and concepts. Of classes and Objects come into existence

**(7) Extensible**

It implies that other languages such as C/C++ can be used to compile the code and thus it can be used further in our python code.

**(8) Large standard library**

Python has large and broad library and provides rich set of module and functions for rapid application development.

**(9) GUI programming support**

Graphical user interfaces can be developed using python.

**(10) Integrated**

It can be easily integrated with languages like C, C++, java etc.

(5) Justify why python is interactive interpreted language?

A) python is an interacted inpreted language because Unlike c/c++ etc, python is an interpreted Object Oriented programming language. By interpreted it is meant that each time a program is run the interpreter checks through the code for errors and then interprets the instructions into machine readable byte code. we can easily integrated python with other languages like C, C++ etc There is no need to compile python code this makes it easier to debug our code. The source code of python is converted into an immediate form called byte code.