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* Python : It is a widely used high level programming language for general-purpose programming and it was created by Guido Van Rossum & was first released in 1991 at Netherland.

This features a dynamic type system and automatic memory management and supports multiple programming paradigms ie., pattern, including object-oriented, imperative, functional programming and procedural & styles. It has a large and comprehensive standard library.

The two major version of Python that are currently in achive are :-

↳ Python 3.x is the current version and is under active development

↳ Python 2.x is the legacy version & will recieve only secured updates until 2020. No new features will be implemented.

'R' Language :

→ Data Science
→ Machine learning
→ Artificial Intelligence
→ Deep learning
→ Statistics

These all can be performed in 'R' language

'Python Language' :-

→ Data Science
→ Machine learning
→ Artificial Intelligence
→ Deep learning
→ Statistics
→ Desktop application
→ web application
→ Database applications
→ Network applications
→ Game Development

All these can be done using Python

* Mobile applications can be executed.

① Module 1 :- Python
→ Basics
→ Object Oriented Programming
→ web application development.

② Module - 2 : Statistics.
→ Descriptive Statistics.
→ Probability along with Numpy / Panday
→ Inferent Calculation.

③ Module - 3 → EDA (ie, Exploratory Data analysis.

→ Numpy / Panday
→ Matplotlib
→ plotly
→ DS project

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- Web Scraping (Text-data entry & Images)

(4) Module 4 :- Machine learning

(5) Module 5 :- Deep learning

↳ Includes NLP & Computer vision

* AGI → Artificial General Intelligence

Ability → Task

- Facial detection, facial recognition, Gender
- NLP → Lang translation → SPAM/HAM → Read & Speak
- Decision making → Drive → Ride → PUBG

Programming in Python :-

* I/P → Print ("Hello")
  O/P → Hello

* I/P → name = input ("Enter your name: ")
  print ("Hello {}, welcome!".format(name))

O/P → Enter your name : Akash Tripathi
Hello Akash Tripathi, welcome!

Github → similar to GDrive
↳ used by programmers.

- Desktop application:
  ex: Calculator, Notepad, etc
- Web application:
  ex:- Youtube, dropbox, Google, Instagram, Quora, Spotify.
- Scientific & Numeric Computing:
  ex:- Scipy, Numpy.
- Database applications:
  ex:- Library Management systems, pharmaceutical.
- Network applications:
  ex:- Network sniffer, Network parameter extraction, Routing Algo's like ospf.
- Developing games:
  ex:- Battlefield, Sims 4, Pubg.
- Data Science:-
  ex:- Pandas, Matplotlib, Seaborn, --- etc
- Machine learning:
  ex: Scikit

- AI
  ex: AIMA - AI: A modern approach

- IOT:
  ex: Raspberry pi, phillips (coarles great with low level code in C++)

Features of python:-

(i) Simple & Easy to learn.
(ii) Free & open source
(iii) General Purpose & high level programming language
(iv) Platform Indepent
  ex: Mac, linux, windows
(v) Case-sensitive (upper & lower)
(vi) Interpreted language
(vii) Dynamically Typed
  * no need to declare them as int (or) float (or) anything.

* Rich library:-
  * writing the codes of AI, DS, ML, DL, Desktop & web applications

→ We can write console code using python.

Comments in python:

Identifiers: Any variable name, function name, class name:-

* Rules of Identifiers:-

→ Allowed Characters:-
  * Alphabets, Digits & Underscore symbol.

→ Identifier should'nt start with a digit

→ case sensitive

→ No length limit

→ Can't use reserved words for identifier

* I/P → abc123 = 10.
  ABC123 = 20
  print(id(abc123))
  print(id(ABC123))
  #id → address of the memory.

  o/p → 140732204984480
  140732204984800.

* Reserved word in Python: (35)
  (You can google it and get the list).

* Basic data - types in Python

* Numeric :- int, float, complex (Immutable)
- Boolean :- Bool (true/false)
- Strings : Immutable
- List → (Mutable, mostly used to store homogenous data types)
- Tuple → (Immutable, faster as compared to list)
- Set → (unordered collection of items, mutable & removes duplicates)
- Dictionary :- (unordered collection of key-value pairs, Mutable, the keys are unique - values may not be unique)

→ I/p → a = 2
b = 3.0
c = 5+7j
print (type (a))
print (type (b))
print (type (c))

o/p → int
float
complex

Note :- In complex, any case (Lower / upper) can be used & no error occurs

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i/p → c = 10+20j
print(type(c))
print(c+5)
print(isinstance(c, complex))
print(c.real)
print(c.imag)

o/p → <class 'complex'>
15+20j
True
10.0
20.0

* a = input("enter 1st no.: ")
b = input("enter 2nd no.: ")
print(type(a), type(b))
print(a+b)

o/p - enter 1st no.: 1
enter 2nd no.: 1
<class 'str'>, class 'str'>
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Note :-
number + Number = addition
String + string = joining together

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1) P → a = 20
b = 2
print (a ** b) ↓ Power of something
ie, a^b.

o/p → 400 //

* Operators :-

→ Arithmatic :- +, -, *, %, /, //, **

→ Relational :- >, >=, <, <=

→ Equality :- == != → not equal
↳ comparison

→ Logical :- and, or, not

→ Bitwise :- &, |, ^, ~, <<, >>

→ Assignment :- :=, +=, -=, *=, /=, ... etc

→ ternary.

→ Identity :- is, is not (used for address comparison

→ membership :- in, not in (for while)

* | a = 20 | a = 20 | a = 20
b = 2 | b = 2 | b = 3
print (a/b) | print (a//b) | print (a % b)
o/p → 10.0 // | o/p → 10 | o/p ⇒ 2
↳ give remainder