Python software provides

1. **IDLE** (Integrated Development Learning Environment), it code editor or IDE provided by python
2. **Python shell**
3. **Python standard libraries**
4. **Python tools**
    a. **Python Debugger**
    b. **Python library installer (PIP)**
5. **PVM (Python Virtual Machine)**

IDE's

1. **VSCode**
2. **PyCharm**
3. **Spider**
4. **Jupyter Notebook**
5. **Google collab**

Python Distributions

Python distribution is a python software bundle which consist of

1. Python software
2. Application specific libraries
3. IDE's

1. Anaconda
2. ActiveState ActivePython (commercial and community versions, including scientific computing modules)
3. Nuitka (a compiler that packages user code with CPython into a static binary for improved performance and IP protection)

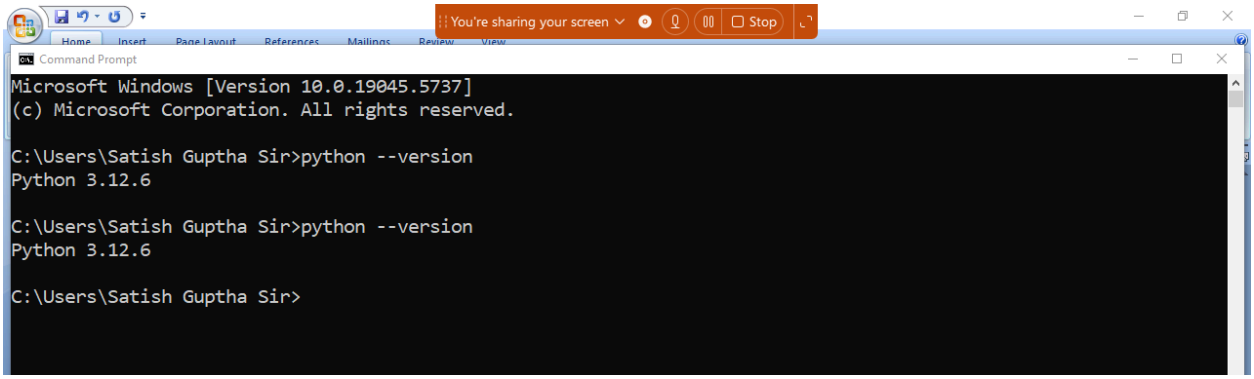
Python implementation

Python is implemented in various languages

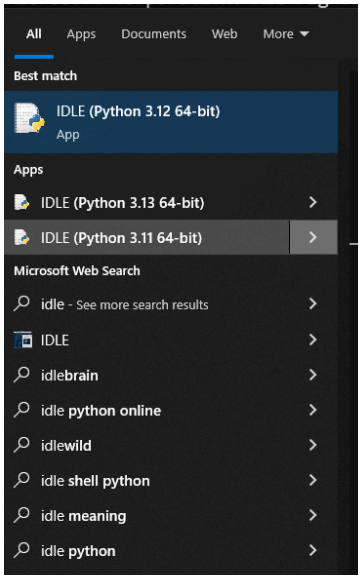
1. Jython
2. Ironpython
3. MicroPython

How to find python software installed or not?

1. Open command prompt



2. Search IDLE



Python working modes

Python developer work with python in two modes

1. Interactive mode
2. Programming mode/Scripting mode

Interactive mode

In interactive mode python developer work with python shell
Python shell is a command line interface which allows executing one command or single command.
In interactive mode programmer cannot develop programs.
Python shell is also called REPL tool
R □ READ
E □ Evaluate
P □ Print
L □ Loop

Example:

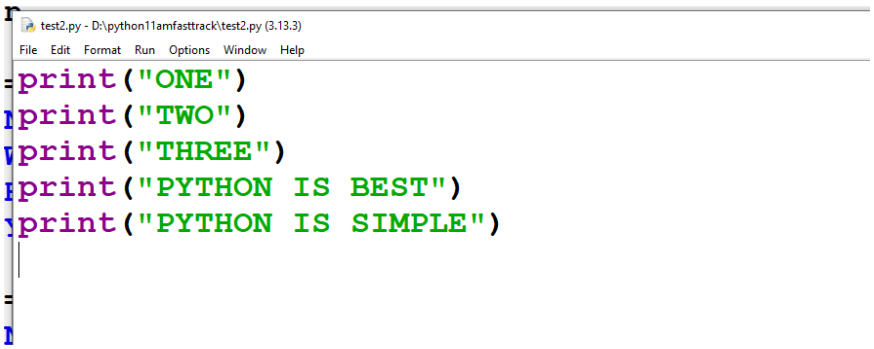
```
>>> 10+20
30
>>> max(10,20,30)
30
>>> import numpy
Traceback (most recent call last):
  File "<pyshell#2>", line 1, in <module>
    import numpy
ModuleNotFoundError: No module named 'numpy'
>>> import math
>>> math.sqrt(9)
3.0
```

Programming mode or Scripting mode

In programming mode python developer write programs
Every python program is having extension .py
Technically every python program is called one module

Basic steps for writing python program

1. Select File New File



2. Save the program
    a. Select File Save
3. Run Program
    a. Run Run Module
4. Close program
    a. File close Window
5. Open Program
    a. File Open

Language Fundamentals

Character set of python

Character set defines, set of characters used in python while writing code or programs.

Python support two types of characters sets

1. ASCII (American Standard Code for Information Interchange)
2. UNICODE (Universal Code)

ASCII support only 256 characters, which include characters in English (A-Z,a-z,0-9 and special characters)
C,C++ uses ASCII character set
UNICODE is superset of ASCII, it supports characters in English and other languages. UNICODE support 1,114,112 characters,

```
>>> name="naresh"
>>> name
'naresh'
>>> नम="नरश"
>>> नम
'नरश'
>>> పర="నరష"
>>> పర
'నరష'
```

Python Tokens

A smallest individual unit within program is called token

1. Keywords
2. Identifiers
3. Literals
4. Data types
5. Operators

Keywords

Keywords are python language related words
Each word is having special meaning in python language
Each word is used for specific purpose

How to find list of keywords in python?

```
>>> import keyword
>>> keyword.kwlist
```

['False', 'None', 'True', 'and', 'as', 'assert', 'async', 'await', 'break', 'class', 'continue', 'def', 'del', 'elif', 'else', 'except', 'finally', 'for', 'from', 'global', 'if', 'import', 'in', 'is', 'lambda', 'nonlocal', 'not', 'or', 'pass', 'raise', 'return', 'try', 'while', 'with', 'yield']
>>> len(keyword.kwlist)
35

Python 3.13.3 supports 35 keywords

Python is case-sensitive language; it finds the difference between uppercase and lowercase

```
>>> a=100
>>> A=200
>>> a
100
>>> A
200
>>> a=300
>>> a
300
```

Identifiers
What is identifier?
Identifier is a user defined word.
This word is used to identify programming elements

1. Variables
2. Function
3. Data types
4. Program/module
5. Package-name

Identifier is user defined word which is created using alphabets (a-z, A-Z),0-9 and allows one special characters _

Rules for defining identifiers

1.
2.
3.
4.
5.

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