

1. What is python & why is it called an interpreted language?

- python is a highlevel, general purpose programming language used for web development, data analysis, automation, AI & more.
- it is called an interpreted language, because the python code is executed line by line by the python interpreter at runtime rather than being compiled into machine code before execution.

2. What are the key features of python that makes it popular for beginners & professionals?

- easy to learn & read — simple, english like syntax.
- interpreted language — no need for compilation
- Dynamically typed — no need to declare variable type.
- Extensive libraries — support modules for DS, AI, web, etc.
- cross-platform — runs on windows, mac OS, linux, etc.
- object-oriented & procedural — supports multiple programming styles.
- Open-source — free & community supported.

3. What is the difference b/w python 2 & python 3?

python 2

- print is a stmt, so you write it without ()

print "Hi"

- Dividing 2 integers uses floor division by default, means it removes decimal

print (5/2) → 2

- treat text as ASCII by default, which can cause errors when working with non-english characters.

- No longer supported

- old syntax

4. What are python's applications in real-world projects?

- web-development - Django, flask framework.
- Data analysis & visualization - Pandas, matplotlib
- ML & AI - tensorflow, scikit learn
- automation/scripting - task automation & bots.
- Game development - pygame.
- Networking & cybersecurity - packet analysis & scanning tools.

python 3.

- print is a fn, so must use ()

print("Hi")

- dividing integers gives a floating point result

print(5/2) → 2.5

- uses unicode by default, allows to handle international text & emojis

- Actively maintained.

- Modern, improved syntax.

5. What is PEP 8 & why is it important in python programming?

- PEP 8 - Python Enhancement Proposal 8 is the official style guide for writing clean, readable python code.
- It defines rules for naming conventions, indentations, line length & spacing.
- Following PEP 8 helps maintain consistent, readable & error free code across projects.

6. Who developed python & in which year it released?

Guido Van Rossum in 1989.

1st version was released in 1991.

7. What do you mean by "dynamically typed" in python?

~~you~~ You do not declare a variable's type when you write code, the interpreter figures out the type while running the program.

eg: `x=5`
`print(x)`

8. What are the diff b/w a compiler & interpreter & which does python use?

Compiler & interpreter are language processors - their job is to translate high level programming code (C, python, C++ or java) into machine code that the computer can understand & execute.

Compiler

- compiler translates the entire pgm into machine code before execution.
eg: c, java, c++
- execution speed faster, since all code is converted to machine code before execution.
- shows all errors at once after compiling.

Interpreter

- an interpreter translates the pgm line by line & executes each line immediately. If there is an error in a particular line, execution stops therefore the next line are not run.
eg: python, javascript.
- Slower execution speed, bcz it translates & executes one line at a time.
- stops at first error. The rest of the code is not executed until the error is fixed.