

Discuss the process by which python executes a program, focusing on the stages involved from source.

1. Source code is the .py file. (a = 5)
2. Python breaks the code into tokens. Step called "Lexical analysis". e.g. IDENTIFIER -> a, OPERATOR -> =, NUMBER -> 5
3. Syntax analysis phase, here it builds the Abstract syntax tree(Python checks grammar)
4. After AST, python compiles it into Bytecode(low level instruction, platform independent), stored in .pyc files
5. Now the Python Virtual Machine executes the bytecode.
6. Python is a compiled(to bytecode) then interpreted(by PVM) language.

Discuss the fundamental features of python prog lang that make it widely used for modern software development?

1. Simplicity & readability
2. Interpreted + Rapid development
3. Rich libraries
4. Cross platform
5. Object oriented + procedural
6. Automatic memory management
7. Dynamic typing
8. Integration capabilities