

Unit 2: Introduction to Python

****Lecture 6: Introduction and Features****

Overview of Python's history, philosophy, and core features.

Agenda

1. What is Python?
2. Brief History and Origin
3. The Zen of Python
4. Core Python Features
5. Comparison with other languages

What is Python?

Python is a high-level, general-purpose programming language. It emphasizes code readability with the use of significant indentation. Supports multiple programming paradigms: procedural, object-oriented, and functional. Often described as a 'batteries included' language due to its comprehensive standard library.

History of Python

Created by Guido van Rossum in the late 1980s.

First released (version 0.9.0) in 1991.

Designed as a successor to the ABC programming language.

Name inspired by the British comedy group Monty Python, not the snake.

The Zen of Python

A collection of 19 guiding principles for writing computer programs.
Accessible by typing 'import this' in the Python interpreter.

Key principles include:

- Beautiful is better than ugly.
- Explicit is better than implicit.
- Simple is better than complex.

Key Feature: Easy to Learn and Use

Simple syntax similar to the English language.

Minimal use of special characters; relies on indentation instead of braces '{}'.
'{'

Allows developers to write programs with fewer lines than some other languages.

Key Feature: Interpreted Language

Python code is executed line-by-line by the interpreter.

Makes debugging easier as execution stops on the first error.

No separate compilation step is required, facilitating rapid application development.

Key Feature: Dynamically Typed

Variables do not need an explicit declaration to reserve memory space. The type of the variable is determined at runtime based on the assigned value.

```
x = 10          # x is an integer
x = 'Hello'     # x is now a string
```

Key Feature: Platform Independent

Python code can run on various operating systems without modification.
Write Once, Run Anywhere (WORA).
Interpreters are available for Windows, macOS, Linux, and more.

Key Feature: Extensive Standard Library

Provides rich modules and functions for various tasks.

Includes libraries for regular expressions, string manipulation, internet protocols, databases, etc.

Reduces the need to write code from scratch.

A Simple Comparison: Python vs Java

****Python:****

```
print('Hello, World!')
```

****Java:****

```
public class Main {  
    public static void main(String[] args) {  
        System.out.println("Hello, World!");  
    }  
}
```

Summary

Python is a high-level, interpreted, dynamically typed language. Its design philosophy emphasizes code readability. Key features include cross-platform support, a massive standard library, and multi-paradigm support.