Python

**Class 1**

# Introduction to Python

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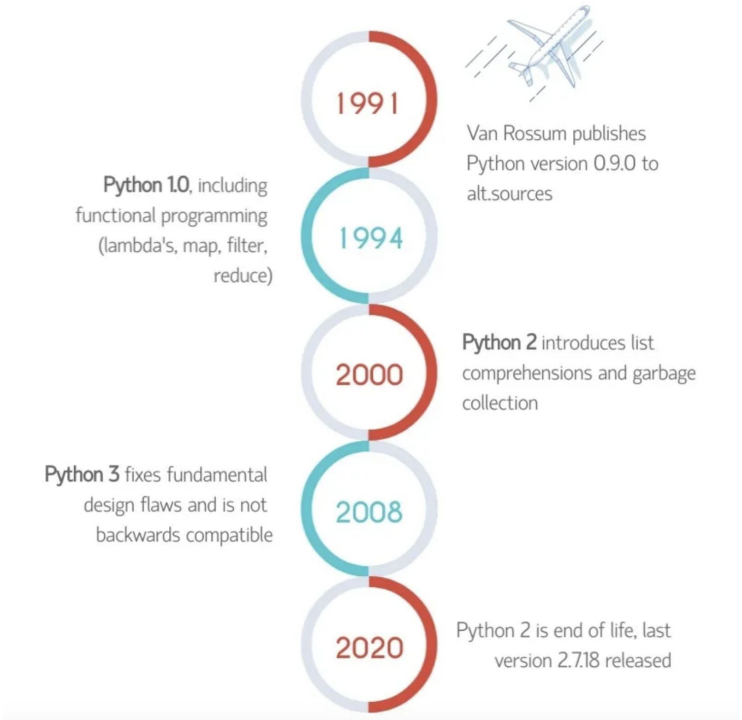
# 01.

# Overview of Python

# Python History

- Created by Guido van Rossum, released in 1991
- Named after "Monty Python's Flying Circus"



# Key Features

- High-level: Simplifies complex programming tasks
- Interpreted: Runs code line-by-line, which helps debugging
- Dynamically Typed: No need to declare variable types
- Object-Oriented: Supports classes and objects
- Extensive Standard Library: Includes modules for various tasks like web development, data analysis, and more

# Community and Support

- Large and active community
- Comprehensive documentation
- Abundance of third-party libraries and frameworks

# 02.

# Why Learn Python?

# Versatile Language

- Web Development: Frameworks like **Django** and **Flask**
- Data Science and Machine Learning: Libraries like **Pandas**, **NumPy**, **TensorFlow**
- Automation and Scripting: Automate repetitive tasks
- Software Development: GUI applications, game development (Pygame)
- Internet of Things (IoT): Microcontrollers like Raspberry Pi

# Ease of Learning

- Simple and readable syntax
- Ideal for beginners
- Extensive educational resources available

# Popular and In-Demand

- Consistently ranked as one of the top programming languages
- Widely used in industry-leading companies (Google, Netflix, NASA)
- Strong community support and continuous development

# 03.

# Setting Up

# Installing Python

- Download from https://www.python.org/
- Try to install on your own. It's easy!
- Step-by-step installation guide: https://www.youtube.com/watch?v=dB2rGSPI-zI
- Verifying the installation via command line (python –version)

# Setting Up an IDE

- Recommendations:
  - PyCharm: Professional features for larger projects
  - **VS Code**: Lightweight and highly customizable (what we'll use)
- Configuring your IDE for Python development

# 04.

# First Python Script

Hello, World!

# Basic Syntax

- `print("Hello, World!")`
- `input()`
- Running a Python script from the command line

# Script Structure

- Comments (# for single-line comments)
- Indentation for blocks of code

# 05.

# The Basics

# Data Types

- Integers: Whole numbers (e.g., x = 5)
- Floats: Decimal numbers (e.g., y = 3.14)
- Strings: Text data (e.g., name = "Python")
- Booleans: True/False values (e.g., is_active = True)

# All Data Types

| Data Types | Classes | Description |
| --- | --- | --- |
| Numeric | int, float, complex | holds numeric values |
| String | str | holds sequence of characters |
| Sequence | list, tuple, range | holds collection of items |
| Mapping | dict | holds data in key-value pair form |
| Boolean | bool | holds either `True` or `False` |
| Set | set, frozenset | hold collection of unique items |

# Variables

- Assigning values: *a = 10*
- Naming conventions: Use lowercase letters and underscores (e.g., *user_name*)

# Arithmetic Operators

Taking a = 10 and b = 20,

| | | |
|---|---|---|
| + | Addition | a + b = 30 |
| - | Subtraction | a – b = –10 |
| * | Multiplication | a * b = 200 |
| / | Division | b / a = 2 |
| % | Modulus | b % a = 0 |
| ** | Exponent | a**b = 10**20 = 10^2 |
| // | Floor Division | 9//2 = 4 |

# Comparison Operators

| | | |
|---|---|---|
| == | Equal | (a == b) is not true. |
| != | Not equal | (a != b) is true. |
| > | Greater than | (a > b) is not true. |
| < | Less than | (a < b) is true. |
| >= | Greater than or equal to | (a >= b) is not true. |
| <= | Less than or equal to | (a <= b) is true. |
| == | Equal | (a == b) is not true. |

# Logical Operations

| | | |
|---|---|---|
| and | AND | a and b |
| or | OR | a or b |
| not | NOT | not(a) |

# Conditional Statements

- if…elif…else

# 06.

# Python in Action

Let’s see some basic codes!

# 07.

# Recap and Q&A

# Recap

- Overview of Python and its features
- Setting up the environment
- Writing basic Python scripts
- Understanding data types and variables

Open floor for questions and clarifications

# 08.

# To-do at Home

# Requirements

- Install Python and set up your IDE
- Write a Python script and play around

# Problem to Solve 1

Take the heights of your 2 friends (in inches) as input and print their average height!

**Example:**
height_1 = 68
height_2 = 70
This should print 69

*(Hint: use variables to take inputs)*

Bonus: Print the average height in ft and inch format (5'7")

# Problem to Solve 2

Take two numbers as input, print *"Genjam"* if one is negative and one is positive. Else print "Thik Ase"

**Example:**
input_1 = –5
input_2 = 7
This should print *Genjam*

*(Hint: use conditionals with logical operators)*

# Problem to Solve 3

Just print your name. That's it.

Script review in the next class

# Thank you.

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