Introduction to programming with Python

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What is a Computer?

- A computer is an electronic device that processes and stores data.
- It consists of hardware (physical components) and software (programs and instructions).
- Modern processors are incredibly fast and can perform billions (even trillions) of operations per second.

What is programming

- Programming is the process of giving instructions to a computer to perform specific tasks.
- It involves writing code using a programming language to communicate with the computer.

Importance of Programming

- Computer's Binary Language
  - Computers communicate in binary (0s and 1s) at the lowest level.
  - Direct communication is complex and error-prone.
- Programming Bridges the Gap:
  - Programming provides a human-friendly way to instruct computers.
  - Enables complex tasks through simple, readable code.

Introduction to Python Programming

- Created by Guido van Rossum and released in 1991.
- High-level programming language designed for readability and simplicity.
- Focuses on code readability through indentation and clear syntax.

Introduction to Python Programming

- Common Uses:
  - Web Development: Frameworks like Django, Flask for building web applications.
  - Data Analysis: Libraries like pandas, numpy for processing and analyzing data.
  - AI and Machine Learning: TensorFlow, PyTorch for building advanced models.
  - Scripting: Automate repetitive tasks and workflows.
  - Scientific Computing: Utilized in scientific research and simulations.

Installation using Anaconda

- Anaconda Overview:
  - Python distribution for scientific computing and data analysis.
  - Includes tools like Jupyter Notebook.
- Download Anaconda from:
  - anaconda.com/download
- Advantages of Anaconda:
  - Ready-to-use Python with essential packages.
  - Simplifies package management and environment setup.

Python Basics

- Variables
  - Containers to store data.
  - No need to declare type explicitly.
- Data Types:
  - str (string), int (integer), bool (boolean).

Python Basics

- Control Flow
  - Control the program's flow based on conditions.
- IF and ELSE , ELIF