**Python Roadmap**

What is Programming?

-- Programming is a way for us to tell computers what to do.

-- Computer is a very dumb machine and it only does what we tell it to do.

-- Hence, we learn programming and tell computers to do what we are very slow at – computation.

-- If I ask you to calculate 5 + 6, you will immediately tell 11. How about 4658463874 \* 48452?

-- You will start searching for a calculator or will jump to a new tab to do the same.

-- So, by learning programming, basically you are going to learn how to talk to a computer.

What is Python?

-- Python is a dynamically typed, general purpose programming language that supports an object-oriented programming approach as well functional programming approach.

-- Python is an interpreted and high-level programming language.

-- It was created by Guido Van Rossum in 1991.

Features of Python

-- Python is simple and easy to understand.

-- It is interpreted and platform-independent which makes debugging very easy.

-- Python is an open-source programming language.

-- Python provides very big library support. Some of the popular libraries include pandas, numpy, Tenserflow, Selenium, OpenCV etc.

-- It is possible to integrate other programming languages within python.

What is Python Used for?

-- To create web applications.

-- To handle databases.

-- Helps in data analytics to analyse and understand raw data for insights and trends.

-- Used in data visualization to create plots and graphical representations.

-- Used in AI and machine learning to stimulate human behaviour and to learn about past data without hard coding.

-- Used in business and accounting to perform complex mathematical operations along with quantitative and qualitative analysis.

Topics for the Roadmap

-- Modules and pip

-- First Python Program

-- Comments, Escape sequences and print statements

-- Variables and datatypes

-- Exercise: Calculator using Python

-- Typecasting

-- Taking user inputs

-- strings

-- String slicing and operations on string

-- String methods

-- If Else conditional statements

-- Exercise 2: Good morning, sir!

-- Match Case statements

-- For loops

-- While loops

-- Loop Control Statements – Break, continue, pass

-- Functions

-- Intro to List

-- List methods

-- Intro To Tuples

-- Operations on Tuples

-- Exercise and practice

-- f-string

-- docstring

-- Recursion

-- sets

-- Set methods

-- Dictionary

-- Dictionary methods

-- For loop with else

-- Exception handling

-- Finally keyword

-- Raising custom errors

-- Exercise and practice

-- Short hand if else statements

-- Enumerate

-- Virtual environment

-- How import works?

-- \_\_main\_\_ method

-- OS module

-- Exercise and practice

-- Local vs global variables

-- File IO

-- read(), readlines() etc

-- seek(), tell() etc

-- Lambda functions

-- Map, filter and reduce

-- ‘is’ vs ‘==’

-- Exercise and practice

-- Introduction to OOP

-- Classes and objects

-- Constructors

-- Decorators

-- Getters and setters

-- Inheritance

-- Access modifiers

-- Exercise and practice

-- Static methods

-- Instance variable vs Class variable

-- Exercise and practice

-- Class methods

-- Class methods as alternative constructor

-- dir, dict and \_\_help\_\_

-- Super keyword

-- Magic/dunder methods

-- Method overriding

-- Exercise and practice

-- Operator overloading

-- Single inheritance

-- Multiple inheritance

-- Multilevel inheritance

-- Hybrid vs Hierarchical inheritance

-- Exercise and practice

-- Walrus operator

-- Shutil module

-- Exercise and practice

-- Request module

-- Exercise and practice

-- Generators

-- Function caching

-- Exercise and practice

-- Regular expressions

-- AsyncIO

-- Multi threading

-- Multi processing

-- Exercise and practice