

# 30-Day Python Challenge

## Week 1: Python Basics

Day 1: Introduction & Setup - Variables, print(), comments

Day 2: Data Types - int, float, str, bool, type conversion

Day 3: Operators - Arithmetic, comparison, logical, bitwise

Day 4: Strings - Slicing, methods, formatting

Day 5: Lists - Indexing, slicing, methods, list comprehension

Day 6: Tuples & Sets - Immutable types, uniqueness, basic operations

Day 7: Dictionaries - Keys/values, methods, looping

## Week 2: Control Flow & Functions

Day 8: if, else, elif - Conditional logic

Day 9: Loops - for, while, break, continue, pass

Day 10: Functions (basics) - def, arguments, return values

Day 11: Functions (advanced) - \*args, \*\*kwargs, lambda, scope

Day 12: Recursion - Recursive function examples

Day 13: Exception Handling - try, except, finally, custom errors

Day 14: Built-in Functions & Modules - map(), filter(), zip(), enumerate()

## Week 3: Intermediate Python

Day 15: File I/O - Read/write .txt and .csv files

Day 16: List Comprehensions & Generators - Generator expressions, yield

Day 17: Dates & Time - datetime, time, formatting

Day 18: Standard Libraries - os, sys, math, random

Day 19: OOP (Classes & Objects) - \_\_init\_\_, attributes, methods

Day 20: OOP (Inheritance & Polymorphism) - super(), overriding

Day 21: OOP (Dunder Methods) - \_\_str\_\_, \_\_len\_\_, etc.

## Week 4: Advanced Topics + Final Project

Day 22: Regular Expressions - re.match, search, findall

Day 23: Lambda, Map, Filter, Reduce - Functional programming

Day 24: Decorators & Closures - Function wrappers

Day 25: Working with JSON - `json.load`, `json.dump`

Day 26: Virtual Environments & pip - `venv`, installing packages

Day 27: Testing with unittest - Writing and running tests

Day 28: Introduction to APIs - `requests`, API response parsing

Day 29: Web Scraping - BeautifulSoup, basic scraping

Day 30: Final Project - Combine topics into a mini project