Python Cheat Sheet

Table of Contents

Chapter 1: Introduction to Python

- What is Python?
- Installing Python
- Running Python Scripts
- Python IDEs (e.g., PyCharm, VSCode, Jupyter)

Chapter 2: Basic Syntax

- Python Syntax Overview
- Printing to Console: `print()`
- Comments: `# Single-line`, `''' Multi-line '''`
- Indentation Rules

Chapter 3: Data Types and Variables

- Numbers: `int`, `float`, `complex`
- Strings: `"Hello"` or `'World'`
- Boolean: `True`, `False`
- Lists, Tuples, Dictionaries, Sets
- Type Conversion: `str()`, `int()`, `float()`

Chapter 4: Operators

- Arithmetic: `+`, `-`, `*`, `/`, `//`, `%`, `**`
- Comparison: `==`, `!=`, `>`, `<`, `>=`, `<=`
- Logical: `and`, `or`, `not`
- Assignment: `=`, `+=`, `-=`, `*=`
- Membership: `in`, `not in`

Chapter 5: Control Flow (Conditionals and Loops)

- If-Else Statements
- Loops: `for`, `while`
- Break and Continue
- List Comprehensions

Chapter 6: Functions

- Defining Functions: `def func_name():`
- Arguments and Return Values
- Lambda Functions
- Built-in Functions: `len()`, `range()`, `map()`, `filter()`

Chapter 7: Data Structures

- **Lists**: Append, Remove, Index
- **Tuples**: Immutable Lists
- **Dictionaries**: Key-Value Pairs
- **Sets**: Unique Elements
- Iterating Over Data Structures

Chapter 8: File Handling

- Reading Files: `open('file.txt', 'r')`
- Writing Files: `open('file.txt', 'w')`
- Working with CSV Files
- File Handling with `with` Context

Chapter 9: Modules and Packages

- Importing Modules: `import math`
- Creating Modules

- Using `pip` to Install Packages
- Popular Modules: `os`, `sys`, `random`, `datetime`

Chapter 10: Object-Oriented Programming (OOP)

- Classes and Objects
- Inheritance
- Polymorphism
- Encapsulation
- `self` and `__init__`

Chapter 11: Exception Handling

- Try-Except Blocks
- Finally Clause
- Raising Exceptions: `raise`
- Custom Exceptions

Chapter 12: Python Libraries and Frameworks

- Data Analysis: `pandas`, `numpy`
- Visualization: `matplotlib`, `seaborn`
- Web Development: `Flask`, `Django`
- Machine Learning: `scikit-learn`, `TensorFlow`

Chapter 13: Working with APIs

- HTTP Requests: `requests`
- Parsing JSON
- Handling Responses
- Creating APIs with Flask

Chapter 14: Data Science and Visualization Basics

- NumPy Arrays
- DataFrames in Pandas
- Plotting with Matplotlib
- Advanced Visuals with Seaborn

Chapter 15: Advanced Topics

- Decorators
- Generators
- Multithreading
- Async Programming
- Context Managers

Chapter 16: Tips and Best Practices

- Writing Readable Code
- Debugging
- Version Control with Git
- Performance Optimization
- Resources for Further Learning