Python Learning Roadmap - Stage 1 & 2

■ Stage 1: Basics of Python ■ Goal: Understand syntax, basic constructs, and run simple programs. 1. Installing Python and IDEs Definition: Setting up Python and an environment to write code. 2. Variables & Data Types Definition: Variables store data; data types define the type of data. Example: x = 5 y = 3.14 name = "Alice" is_happy = True Output: Stored values in variables. 3. Input/Output name = input("Enter your name: ") print("Hello", name) 4. Operators Arithmetic, Logical, Comparison Example: a, b = 5, 2 print(a+b, a>b, a and b) 5. Conditional Statements if, elif, else 6. Loops for, while 7. break, continue, pass

■ Stage 2: Data Structures & Functions ■ Goal: Write modular and organized code. 1. Lists Definition: Ordered, mutable collection. Example: fruits = ["apple", "banana"] print(fruits[0]) Output: apple 2. Tuples Definition: Ordered, immutable collection. Example: t = (1, 2, 3) print(t[1]) Output: 2 3. Sets Definition: Unordered, unique elements. Example: s = {1, 2, 2, 3} print(s) Output: {1, 2, 3} 4. Dictionaries Definition: Key-value pairs. Example: d = {"name": "Alice", "age": 25} print(d["name"]) Output: Alice 5. String manipulation s = "Hello World" print(s.lower()) 6. Functions def add(a, b): return a + b 7. Scope Local vs global 8. Recursion def fact(n): if n==0: return 1 return n*fact(n-1) 9. Lambda add = lambda x, y: x + y 10. List comprehensions squares = [x**2 for x in range(5)]