
📅 Day 2: Python for Data Science – Basics (with Fun Games)

🎯 Objective

Learn basic Python programming concepts through hands-on coding with **interactive mini-games**. This includes:

- Variables
- Data Types
- Loops
- Functions
- Lists and Dictionaries

🧠 1. Python Basics Overview

🔹 Variables

- Store data in memory.

```
name = "Alice"
age = 22
score = 88.5
```

🔹 Data Types

- Common ones: `int`, `float`, `str`, `bool`, `list`, `dict`

```
is_student = True
marks = [88, 76, 92]
profile = {"name": "Alice", "age": 22}
```

🔹 Loops

Used to repeat code.

For loop:

```
for i in range(5):
    print("Hello", i)
```

While loop:

```
count = 3
while count > 0:
    print("Count:", count)
    count -= 1
```

🔹 Functions

Reusable code blocks.

```
def greet(name):
    return f"Hello, {name}!"

print(greet("Alice"))
```

🕹️ 2. Game-Based Hands-On Tasks

🎮 Game 1: Guess the Number

Concepts Used: Variables, loops, conditionals

```
import random

number_to_guess = random.randint(1, 10)
attempts = 0

print("🎲 Guess a number between 1 and 10")

while True:
    guess = int(input("Your guess: "))
    attempts += 1

    if guess == number_to_guess:
        print(f"🎉 Correct! It took you {attempts} attempts.")
        break
    elif guess < number_to_guess:
        print("Too low!")
    else:
        print("Too high!")
```

🎮 Game 2: Rock, Paper, Scissors

Concepts Used: Lists, conditionals, functions

```
import random

options = ["rock", "paper", "scissors"]

def get_winner(user, computer):
    if user == computer:
        return "It's a tie!"
    elif (user == "rock" and computer == "scissors") or \
         (user == "scissors" and computer == "paper") or \
         (user == "paper" and computer == "rock"):
        return "You win!"
    else:
        return "Computer wins!"

while True:
    user = input("Choose rock, paper, or scissors (or 'q' to quit): ").lower()
    if user == "q":
        break
```

```
    if user not in options:
        print("Invalid choice!")
        continue

    computer = random.choice(options)
    print(f"Computer chose: {computer}")
    print(get_winner(user, computer))
```

🎮 Game 3: Dictionary Quiz Game

Concepts Used: Dictionaries, loops, functions

```
questions = {
    "capital of India": "new delhi",
    "largest planet": "jupiter",
    "programming language that starts with 'P'": "python"
}

score = 0

for question, answer in questions.items():
    user_ans = input(f"What is the {question}? ").lower()
    if user_ans == answer:
        print("✅ Correct!")
        score += 1
    else:
        print(f"❌ Wrong! The correct answer is {answer}")

print(f"Your final score is: {score}/{len(questions)}")
```
