1. Basic Python Exercises (Variables, Data Types, Lists, Dicts, Tuples)

Exercise 1 — Temperature Converter

Write a program that converts temperature from Celsius → Fahrenheit.

Exercise 2 — Simple Interest Calculator

Get:

- Principal
- Rate
- Time
  Return Simple Interest and Total Amount.

Exercise 3 — Student Grade System

Input marks of 5 subjects, calculate:

- Total
- Percentage
- Grade (A/B/C/Fail)

Exercise 4 — List Operations

Given list:

```
nums = [12, 5, 8, 3, 10, 7]
```

Do the following:

- Print largest and smallest number
- Sort list
- Add a new number
- Remove even numbers

Exercise 5 — Dictionary Practice

Create a dictionary of 5 students with marks.
Tasks:

- Print all keys, values
- Find average marks
- Add a new student
- Update an existing student's marks

2. Loops & Functions Challenges

Exercise 6 — Multiplication Table (Loop)

Input a number. Print its table up to 20.

Exercise 7 — Count Vowels in a String

Use loop + conditions.

Exercise 8 — Sum of Digits

Input: 987
Output: 9 + 8 + 7 = 24

Exercise 9 — Function: Check Prime

Create a function:

`is_prime(n)`

Return True or False.

Exercise 10 — Login System (Function + Loops)

Create a simple login system:

- Username = "admin"
- Password = "1234"
- Allow 3 attempts
  If failed, print "Account locked".

3. Guided Hands-on (Extended Practice)

Calculator (Extended Version)

Add support for:

- Addition
- Subtraction
- Multiplication
- Division
- Square & Square Root
- Power

Use functions like:

```
def add(a, b):
```

Guess-the-Number (Extended)

Enhance with:

- Difficulty levels (easy, medium, hard)
- Attempts counter
- Hints: “too high / too low”

Password Strength Checker (Practical)

Rules:

- Length > 8
- Contains uppercase
- Contains numbers
- Contains special chars

Print rating:
⭐ Weak
⭐⭐ Medium
⭐⭐⭐ Strong

4. Fun Task — AI Fortune Teller

Add more features:

- Random prediction categories
  ➤ Health
  ➤ Career

    - ➢ Love
    - ➢ Finance
- Ask user name and greet them
- Save predictions in a text file

5. Numpy Puzzle Board (Reshape, Stack, Split)

Use:

```
import numpy as np
```

Exercise 11 — Reshape Puzzle

Create a 1D array:

```
arr = np.arange(1, 17)
```

Tasks:

- Convert to 4×4
- Convert to 2×8
- Convert to 8×2

Exercise 12 — Vertical & Horizontal Stacking

Given:

```
a = np.array([[1,2],[3,4]])
b = np.array([[5,6],[7,8]])
```

Do:

- hstack
- vstack
- Add a new column of zeros
- Add a new row of ones

Exercise 13 — Splitting Puzzle

Given 6×6 matrix, split into:

- 2 equal horizontal parts
- 3 equal vertical parts
- 4 quadrant blocks

Exercise 14 — Boolean Filtering

From array 1–30:

- Extract even numbers
- Extract multiples of 5
- Extract numbers > 20

6. Pandas Cleaning Challenge (Fix a Dirty Dataset)

Given dataset (dirty):

```
Name,Age,Email,Score
ram,20,ram@gmail,89
,19,sita@xyz.com,abc
john,???,john@gmail.com,90
kumar,21,,76
meera,22,meera@gmail.com,88
```

Tasks:

1️⃣ Load into pandas
2️⃣ Fix missing names
3️⃣ Replace invalid age ("???" → None → mean age)
4️⃣ Fix invalid email
5️⃣ Replace non-numeric score with avg score
6️⃣ Drop duplicates if any
7️⃣ Convert Name → Proper Case

Bonus Challenge:

Print 5 insights from cleaned data.

7. GitHub Practice Tasks

Exercise 15 — Upload Your Code

Upload:

- Calculator
- Guess game
- AI Fortune Teller

Exercise 16 — Commit Practice

Make at least 3 commits:

- Initial commit
- Fix bugs
- Add new feature

Exercise 17 — Create a Readme

Add:

- Project description
- How to run
- Screenshot

8. Extra Fun Challenges

Challenge 1 — Emoji Generator

Print random emojis using Python.

Challenge 2 — Secret Message Encoder

Convert text → ASCII → encrypted form.

Challenge 3 — Mini To-Do Manager

Add tasks
View tasks
Delete tasks
Save in file