Python Practice Problems

(For Building Confidence in Python Programming)

# Basic Problems

1. Find the Oldest Age: User will input 3 ages. Find the oldest one.
2. Celsius to Fahrenheit: Write a program that converts Celsius to Fahrenheit.
3. Swap Two Numbers: User inputs 2 numbers. Swap them.
4. Sum of 3 Digits: Write a program that gives the sum of 3 digits.
5. Reverse a 4-Digit Number: Reverse a 4-digit number and check if it's equal to the original.
6. Odd or Even: Check if a number is odd or even.
7. Leap Year Check: Determine if a given year is a leap year.
8. Euclidean Distance: Find the distance between two coordinates.
9. Triangle Check: Take 3 angles and check if they can form a triangle.
10. Profit or Loss: Compare cost price and selling price to determine profit/loss.

# Mathematical Problems

1. Simple Interest: Calculate simple interest given principal, rate, and time.
2. Volume of a Cylinder: Find volume and cost (given milk cost per liter).
3. Divisibility Check: Check if a number is divisible by 3 & 6.
4. Angle Between Clock Hands: Find the angle between hour and minute hands. (GFG problem link included)
5. Overlapping Rectangles: Check if two rectangles overlap. (GFG problem link included)
6. Weather Determination: Based on temperature and humidity, determine weather conditions.
7. Sum of Squares of Digits: Take 3 digits and add their squares.
8. Armstrong Number Check: Check if a number is an Armstrong number.
9. Narcissistic Number Check: Check if a 4-digit number is narcissistic.
10. Salary Deduction: Calculate in-hand salary after HRA, DA, PF, and tax deductions.

# Menu-Driven & Conversion Programs

1. Menu-Driven Converter:  
   • cm to feet  
   • km to miles  
   • USD to INR  
   • Exit
2. Dogs & Chickens Problem: Given total heads and legs, find the number of dogs and chickens.
3. Sum of First N Numbers: Find sum (e.g., n=10 → 55).
4. Multiply Without \* Operator: Multiply two numbers without using \*.
5. Factorial of a Number: Compute factorial.
6. First 25 Odd Numbers: Print them.
7. Prime Number Check: Check if a number is prime.
8. Armstrong Numbers (100-1000): Print all Armstrong numbers in this range.
9. Population Growth: Calculate town population growth over 10 years.
10. Unique Combinations of 1,2,3,4: Print all unique combinations.

# Number Theory & Series

1. HCF of Two Numbers: Find the highest common factor.
2. LCM of Two Numbers: Find the least common multiple.
3. First 25 Prime Numbers: Print them.
4. Fibonacci Series (First 20): Print the sequence.
5. Compound Interest: Calculate compound interest.
6. Compute n + nn + nnn: For a given integer n.
7. Count Digits in a Number: Find the number of digits.
8. Factors of a Number: Print all factors.
9. Reverse Any Number: Reverse digits of any number.

# Pattern Printing

1. Right-Angled Triangle:  
   \*  
   \*\*  
   \*\*\*  
   \*\*\*\*  
   \*\*\*\*\*
2. Diamond Pattern:  
    \*  
    \*\*\*  
   \*\*\*\*\*  
    \*\*\*  
    \*
3. Number Pyramid:  
   1  
   1 2 1  
   1 2 3 2 1  
   ...
4. Floyd's Triangle:  
   1  
   2 3  
   4 5 6  
   ...

# String Manipulation

1. String Length Without len(): Find length manually.
2. Extract Username from Email: e.g., nitish24singh@gmail.com → nitish24singh.
3. Character Frequency: Count occurrences of a character in a string.
4. Find Index of a Character: Locate a character in a string.
5. Count Vowels: Count vowels in a string.
6. Remove a Character: Delete a specific character from a string.
7. Palindrome Check: Check if a string is a palindrome.

# List & Dictionary Operations

1. Remove Duplicates from List: Create a list with unique elements.
2. Title Case Conversion: Convert string to title case without title().
3. Max Item Without max(): Find the maximum in a list.
4. Reverse a List: Reverse list elements.
5. Search in List: Check if a number exists in a list.
6. Square List Elements: Create a new list with squares of old list items.
7. Reverse Words in String: e.g., 'Hello how are you' → 'you are how Hello'.
8. Count Words in String: Find the number of words.
9. Check Ascending Order: Verify if a list is sorted.
10. Split List into Odds & Evens: Create two lists.

# Matrix & Advanced Problems

1. Merge Lists Without +: Combine two lists.
2. Replace Item in List: Modify list if item found.
3. 2D to 1D List: Flatten a matrix.
4. Union & Intersection of Lists: Perform set operations.
5. Max of Each Matrix Row: Print max element per row.
6. Integer to String: Convert without str().
7. Matrix Shape: Print rows and columns.
8. Matrix Multiplication Check: Verify if multiplication is possible.
9. Matrix Multiplication: Perform multiplication.
10. Sort List Without Built-ins: Implement sorting manually.

# Dictionary & File Operations

1. Most Frequent Word in Song: Find the most repeated word.
2. List to Dictionary: Keys = numbers, values = squares.
3. Merge Dictionaries: Combine two dictionaries.
4. Swap Min & Max Values: Swap key-value pairs.
5. Histogram with Bins: Count frequency in bins (user-provided bin size).