**PYTHON BASICS**

**VARIABLES, DATA TYPES, OPERATORS**

1. Digit Sum Calculator Ask the user for a number and calculate the sum of its

digits. Example: 753 → 7 + 5 + 3 = 15

num = input("Enter a number: ")

digit\_sum = sum(int(d) for d in num)

print("Digit sum:", digit\_sum)

2. Reverse a 3-digit Number Input a 3-digit number and print it reversed. Input:

123 → Output: 321

num = input("Enter a 3-digit number: ")

if len(num) == 3 and num.isdigit():

print("Reversed:", num[::-1])

else:

print("Please enter a valid 3-digit number.")

3. Unit Converter Build a converter that takes meters and converts to:

centimeters

feet

inches

meters = float(input("Enter distance in meters: "))

print("Centimeters:", meters \* 100)

print("Feet:", meters \* 3.28084)

print("Inches:", meters \* 39.3701)

4. Percentage Calculator Input marks of 5 subjects and calculate total, average,

and percentage. Display grade based on the percentage.

marks = [float(input(f"Enter marks for subject {i+1}: ")) for i in range(5)]

total = sum(marks)

average = total / 5

percentage = (total / 500) \* 100

print("Total:", total)

print("Average:", average)

print("Percentage:", percentage)

if percentage >= 90:

grade = 'A'

elif percentage >= 75:

grade = 'B'

elif percentage >= 60:

grade = 'C'

elif percentage >= 50:

grade = 'D'

else:

grade = 'F'

print("Grade:", grade)

**CONDITIONALS**

5. Leap Year Checker A year is a leap year if it’s divisible by 4 and (not

divisible by 100 or divisible by 400).

year = int(input("Enter a year: "))

if (year % 4 == 0 and year % 100 != 0) or (year % 400 == 0):

print("Leap year")

else:

print("Not a leap year")

6. Simple Calculator Input two numbers and an operator ( + - \* / ) and perform the

operation using if...elif...else .

a = float(input("Enter first number: "))

b = float(input("Enter second number: "))

op = input("Enter operator (+, -, \*, /): ")

if op == '+':

print("Result:", a + b)

elif op == '-':

print("Result:", a - b)

elif op == '\*':

print("Result:", a \* b)

elif op == '/':

if b != 0:

print("Result:", a / b)

else:

print("Cannot divide by zero")

else:

print("Invalid operator")

7. Triangle Validator Given 3 side lengths, check whether they can form a valid

triangle.

a = float(input("Enter side A: "))

b = float(input("Enter side B: "))

c = float(input("Enter side C: "))

if a + b > c and a + c > b and b + c > a:

print("Valid triangle")

else:

print("Not a valid triangle")

8. Bill Splitter with Tip Ask total bill amount, number of people, and tip

percentage. Show final amount per person.

total = float(input("Enter total bill amount: "))

people = int(input("Number of people: "))

tip\_percent = float(input("Tip percentage: "))

tip = total \* (tip\_percent / 100)

final\_amount = total + tip

per\_person = final\_amount / people

print(f"Each person should pay: {per\_person:.2f}")

**LOOPS**

9. Find All Prime Numbers Between 1 and 100 Use a nested loop to check

divisibility.

for num in range(2, 101):

is\_prime = True

for i in range(2, int(num\*\*0.5)+1):

if num % i == 0:

is\_prime = False

break

if is\_prime:

print(num, end=' ')

10. Palindrome Checker Ask for a string and check whether it reads the same

backward.

text = input("Enter a string: ")

if text == text[::-1]:

print("Palindrome")

else:

print("Not a palindrome")

11. Fibonacci Series (First N Terms) Input n , and print first n terms of the

Fibonacci sequence.

n = int(input("Enter how many terms: "))

a, b = 0, 1

for \_ in range(n):

print(a, end=' ')

a, b = b, a + b

12. Multiplication Table (User Input) Take a number and print its table up to 10:

5 x 1 = 5

5 x 2 = 10

...

num = int(input("Enter a number: "))

for i in range(1, 11):

print(f"{num} x {i} = {num\*i}")

13. Number Guessing Game

Generate a random number between 1 to 100

Ask the user to guess

Give hints: "Too High", "Too Low"

Loop until the correct guess

import random

target = random.randint(1, 100)

guess = None

while guess != target:

guess = int(input("Guess the number (1-100): "))

if guess < target:

print("Too low!")

elif guess > target:

print("Too high!")

else:

print("Correct!")

14. ATM Machine Simulation

Balance starts at

10,000

Menu: Deposit / Withdraw / Check Balance / Exit

Use a loop to keep asking

Use conditionals to handle choices

balance = 10000

while True:

print("\n1. Deposit\n2. Withdraw\n3. Check Balance\n4. Exit")

choice = input("Choose an option: ")

if choice == '1':

amt = float(input("Enter deposit amount: "))

balance += amt

elif choice == '2':

amt = float(input("Enter withdrawal amount: "))

if amt <= balance:

balance -= amt

else:

print("Insufficient funds")

elif choice == '3':

print("Current balance:", balance)

elif choice == '4':

break

else:

print("Invalid option")

15. Password Strength Checker

Ask the user to enter a password

Check if it's at least 8 characters

Contains a number, a capital letter, and a symbol

import re

password = input("Enter a password: ")

if (len(password) >= 8 and

re.search(r"\d", password) and

re.search(r"[A-Z]", password) and

re.search(r"[!@#$%^&\*(),.?\":{}|<>]", password)):

print("Strong password")

else:

print("Weak password. Try again.")

16. Find GCD (Greatest Common Divisor)

Input two numbers

Use while loop or Euclidean algorithm

a = int(input("Enter first number: "))

b = int(input("Enter second number: "))

while b:

a, b = b, a % b

print("GCD is", a)