**Question 1:**

**Program to calculate the value based on the formula:**

import math

def calculate\_values():

C = 50

H = 30

D\_values = input("Enter comma-separated values for D: ").split(",")

result = []

for D in D\_values:

Q = math.sqrt((2 \* C \* int(D)) / H)

result.append(int(Q))

print(",".join(map(str, result)))

calculate\_values()

**Example Input:**

100,150,180

**Output:**

18,22,24

**Question 2:**

**Program to generate a 2D array based on user input:**

def generate\_2d\_array():

X, Y = map(int, input("Enter two numbers (X and Y): ").split(","))

result = []

for i in range(X):

row = []

for j in range(Y):

row.append(i \* j)

result.append(row)

print(result)

generate\_2d\_array()

**Example Input:**

3,5

**Output:**

[[0, 0, 0, 0, 0], [0, 1, 2, 3, 4], [0, 2, 4, 6, 8]]

**Question 3:**

**Program to accept a comma-separated sequence of words and sort them alphabetically:**

def sort\_words():

words = input("Enter words (comma separated): ").split(",")

words.sort()

print(",".join(words))

sort\_words()

**Example Input:**

without,hello,bag,world

**Output:**

bag,hello,without,world

**Question 4:**

**Program to remove duplicate words and sort them alphanumerically:**

def remove\_duplicates\_and\_sort():

words = input("Enter words (space separated): ").split()

unique\_words = sorted(set(words))

print(" ".join(unique\_words))

remove\_duplicates\_and\_sort()

**Example Input:**

hello world and practice makes perfect and hello world again

**Output:**

again and hello makes perfect practice world

**Question 5:**

**Program to calculate the number of letters and digits in a sentence:**

def count\_letters\_and\_digits():

sentence = input("Enter a sentence: ")

letters = sum(c.isalpha() for c in sentence)

digits = sum(c.isdigit() for c in sentence)

print(f"LETTERS {letters}")

print(f"DIGITS {digits}")

count\_letters\_and\_digits()

**Example Input:**

hello world! 123

**Output:**

LETTERS 10

DIGITS 3

**Question 6:**

**Program to validate password input based on specified criteria:**

import re

def validate\_passwords():

passwords = input("Enter passwords (comma separated): ").split(",")

valid\_passwords = []

for password in passwords:

if (6 <= len(password) <= 12 and

re.search(r'[a-z]', password) and

re.search(r'[0-9]', password) and

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

re.search(r'[$#@]', password)):

valid\_passwords.append(password)

print(",".join(valid\_passwords))

validate\_passwords()

**Example Input:**

ABd1234@1,a F1#,2w3E\*,2We3345

**Output:**

ABd1234@1