Question 1:
Write a program that calculates and prints the value according to the given formula:
Q = Square root of [(2 * C * D)/H]
Following are the fixed values of C and H:
C is 50. H is 30.
D is the variable whose values should be input to your program in a comma-separated sequence.
Example
Let us assume the following comma separated input sequence is given to the program:
100,150,180
The output of the program should be:
18,22,24

Question 2:
Write a program which takes 2 digits, X,Y as input and generates a 2-dimensional array. The element value in the i-th row and j-th column of the array should be i*j.
Note: i=0,1.., X-1; j=0,1,¡Y-1.
Example
Suppose the following inputs are given to the program:
3,5
Then, the output of the program should be:
[[0, 0, 0, 0, 0], [0, 1, 2, 3, 4], [0, 2, 4, 6, 8]]

Question 3:
Write a program that accepts a comma separated sequence of words as input and prints the words in a comma-separated sequence after sorting them alphabetically.
Suppose the following input is supplied to the program:
without,hello,bag,world
Then, the output should be:
bag,hello,without,world

Question 4:
Write a program that accepts a sequence of whitespace separated words as input and prints the words after removing all duplicate words and sorting them alphanumerically.
Suppose the following input is supplied to the program:
hello world and practice makes perfect and hello world again
Then, the output should be:
again and hello makes perfect practice world

Question 5:
Write a program that accepts a sentence and calculate the number of letters and digits.
Suppose the following input is supplied to the program:
hello world! 123
Then, the output should be:
LETTERS 10

DIGITS 3

Question 6:
A website requires the users to input username and password to register. Write a program to check the validity of password input by users.
Following are the criteria for checking the password:
1. At least 1 letter between [a-z]
2. At least 1 number between [0-9]
1. At least 1 letter between [A-Z]
3. At least 1 character from [$#@]
4. Minimum length of transaction password: 6
5. Maximum length of transaction password: 12
Your program should accept a sequence of comma separated passwords and will check them
according to the above criteria. Passwords that match the criteria are to be printed, each separated by a comma.
Example
If the following passwords are given as input to the program:
ABd1234@1,a F1#,2w3E*,2We3345
Then, the output of the program should be:
ABd1234@1

Solution 1

```
import math

C = 50 H = 30

values = input("Enter comma separated values of D: ") d_list = values.split(",")

results = [] for d in d_list: q = round(math.sqrt((2 * C * int(d)) / H)) results.append(str(q))

print(",".join(results))
```

Solution 2

```
x, y = map(int, input("Enter comma separated values of X and Y: ").split(","))

array = [[i*j for j in range(y)] for i in range(x)]

print(array)
```

Solution 3

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

```
words.sort()

print(",".join(words))
```

Solution 4

```
words = input("Enter whitespace separated words: ").split()

words = list(set(words))

words.sort()

print(" ".join(words))
```

Solution 5

```
sentence = input("Enter a sentence: ")

letter_count = 0 digit_count = 0

for char in sentence: if char.isalpha(): letter_count += 1 elif char.isdigit(): digit_count += 1

print("LETTERS", letter_count) print("DIGITS", digit_count)
```

Solution 6

```
import re

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

valid_passwords = [] for password in passwords: if len(password) < 6 or len(password) > 12:
continue if not re.search("[a-z]", password): continue if not re.search("[A-Z]", password):
continue if not re.search("[0-9]", password): continue if not re.search("[$#@]", password):
continue valid_passwords.append(password)

print(",".join(valid_passwords))
```