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

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| --- |
| 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. | |
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| Note: i=0,1.., X-1; j=0,1,¡­Y-1. |
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| Example |
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| Suppose the following inputs are given to the program: |
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|  |
| --- |
| 3,5 |
|  |

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| --- |
| Then, the output of the program should be: |
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| --- |
| [[0, 0, 0, 0, 0], [0, 1, 2, 3, 4], [0, 2, 4, 6, 8]] |
|  |

Question 3:

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| 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. |
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| Suppose the following input is supplied to the program: |
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| --- |
| without,hello,bag,world |
|  |

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| Then, the output should be: |
|  |

bag,hello,without,world

Question 4:

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| 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. |
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| Suppose the following input is supplied to the program: |
|  |

|  |
| --- |
| hello world and practice makes perfect and hello world again |
|  |

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| --- |
| Then, the output should be: |
|  |

again and hello makes perfect practice world

Question 5:

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| --- |
| Write a program that accepts a sentence and calculate the number of letters and digits. |
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| Suppose the following input is supplied to the program: |
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| --- |
| hello world! 123 |
|  |

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| --- |
| Then, the output should be: |
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|  |
| --- |
| LETTERS 10 |
|  |

DIGITS 3

Question 6:

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| A website requires the users to input username and password to register. Write a program to check the validity of password input by users. |
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| Following are the criteria for checking the password: |
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| --- |
| 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 |
|  |

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| 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. |
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| --- |
| Example |
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| --- |
| If the following passwords are given as input to the program: |
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|  |
| --- |
| ABd1234@1,a F1#,2w3E\*,2We3345 |
|  |

|  |
| --- |
| Then, the output of the program should be: |
|  |

ABd1234@1

Anwers:

Sure! Here are the solutions to the programming questions:

Question 1:

```python

import math

def calculate\_values(sequence):

C = 50

H = 30

result = []

values = sequence.split(',')

for value in values:

D = int(value)

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

result.append(str(int(Q)))

return ','.join(result)

input\_sequence = input("Enter comma-separated values for D: ")

output = calculate\_values(input\_sequence)

print("Output:", output)

```

Question 2:

```python

def generate\_array(X, Y):

array = []

for i in range(X):

row = []

for j in range(Y):

row.append(i \* j)

array.append(row)

return array

input\_values = input("Enter two digits (X, Y): ")

X, Y = map(int, input\_values.split(','))

output\_array = generate\_array(X, Y)

print("Output:")

for row in output\_array:

print(row)

```

Question 3:

```python

def sort\_words(words):

sorted\_words = sorted(words.split(','))

return ','.join(sorted\_words)

input\_words = input("Enter comma-separated words: ")

output = sort\_words(input\_words)

print("Output:", output)

```

Question 4:

```python

def remove\_duplicates\_and\_sort(words):

unique\_words = sorted(set(words.split()))

return ' '.join(unique\_words)

input\_words = input("Enter whitespace-separated words: ")

output = remove\_duplicates\_and\_sort(input\_words)

print("Output:", output)

```

Question 5:

```python

def count\_letters\_and\_digits(sentence):

letters = 0

digits = 0

for char in sentence:

if char.isalpha():

letters += 1

elif char.isdigit():

digits += 1

return letters, digits

input\_sentence = input("Enter a sentence: ")

letter\_count, digit\_count = count\_letters\_and\_digits(input\_sentence)

print("LETTERS", letter\_count)

print("DIGITS", digit\_count)

```

Question 6:

```python

import re

def validate\_passwords(passwords):

valid\_passwords = []

for password in passwords:

if re.match(r"^(?=.\*[a-z])(?=.\*[A-Z])(?=.\*\d)(?=.\*[$#@])[A-Za-z\d$#@]{6,12}$", password):

valid\_passwords.append(password)

return valid\_passwords

input\_passwords = input("Enter comma-separated passwords: ")

password\_list = input\_passwords.split(',')

valid\_passwords = validate\_passwords(password\_list)

print("Valid passwords:", ','.join(valid\_passwords))

```

Note: In Question 6, the program uses regular expressions to validate the passwords based on the given criteria.