Python Programming Basic Assignment 13

Karan Shah

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

```
import math

# Fixed values of C and H
C = 50
H = 30

# Read the input values of D as a comma-separated string
D_input = '3,3'

# Split the string into a list of integers
D_values = [int(x) for x in D_input.split(',')]

# Calculate and print the value of Q for each value of D
for D in D_values:
    Q = int(math.sqrt((2 * C * D) / H))
    print(Q, end=',')
```

```
3,3,
```

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.

```
# Read the input values X and Y
X, Y = map(int, input().split())

# Create an empty 2-dimensional array
array = []

# Generate the array using a nested loop
for i in range(X):
    row = []
    for j in range(Y):
        row.append(i * j)
    array.append(row)

# Print the array
print(array)
```

```
3 3
[[0, 0, 0], [0, 1, 2], [0, 2, 4]]
```

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.

```
# Read the input string
words = 'hello world hello goodbye world'

# Split the string into a list of words
word_list = words.split(',')

# Sort the list of words alphabetically
sorted_words = sorted(word_list)

# Join the sorted list of words into a single string
output_string = ','.join(sorted_words)

# Print the output string
print(output_string)
```

```
hello world hello goodbye world
```

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.

```
# Read the input string
words = 'hello world hello goodbye world'

# Split the string into a list of words
word_list = words.split()

# Remove the duplicate words from the list
unique_words = set(word_list)

# Sort the list of words alphabetically
sorted_words = sorted(unique_words)

# Join the sorted list of words into a single string
output_string = ' '.join(sorted_words)

# Print the output string
print(output_string)
```

```
goodbye hello world
```

5. Write a program that accepts a sentence and calculate the number of letters and digits.

```
# Read the input string
sentence = 'Hello world! 123'

# Initialize the counters for letters and digits
num_letters = 0
num_digits = 0

# Loop through each character in the string
for ch in sentence:
  # Check if the character is a letter
  if ch.isalpha():
    num_letters += 1
  # Check if the character is a digit
  elif ch.isdigit():
    num_digits += 1

# Print the results
print("LETTERS:", num_letters)
print("DIGITS:", num_digits)
```

```
LETTERS: 10
DIGITS: 3
```

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.

```
# Read the password from the user
password = 'HelloWorld123'

# Set the minimum length of the password
```

```
min_length = 8

# Initialize the counters for lowercase letters, uppercase letters, and digits
num_lower = 0
num_upper = 0
num_digits = 0

# Loop through each character in the password
for ch in password:
  # Check if the character is a lowercase letter
  if ch.islower():
    num_lower += 1
  # Check if the character is an uppercase letter
  elif ch.isupper():
    num_upper += 1
  # Check if the character is a digit
  elif ch.isdigit():
    num_digits += 1

# Check if the password is at least 8 characters long
if len(password) < min_length:
  print("Invalid password")
# Check if the password contains at least one lowercase letter, one uppercase letter, and one digit
elif num_lower == 0 or num_upper == 0 or num_digits == 0:
  print("Invalid password")
else:
  print("Valid password")
```

```
Valid password
```

✓ 0s completed at 2:19 AM