Rajalakshmi Engineering College

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 6_CY

Attempt : 1
Total Mark : 40
Marks Obtained : 36.5

Section 1 : Coding

1. Problem Statement

In the enchanted realm of Academia, you, the Academic Alchemist, are bestowed with a magical quill and a parchment to weave the grades of aspiring students into a tapestry of academic brilliance.

The mission is to craft a Python program that empowers faculty members to enter student grades for any two subjects, stores these magical grades in a mystical file, and then, with a wave of your virtual wand, calculates the GPA to unveil the true essence of academic achievement.

Input Format

The input format is a string representing the student's name, any two subjects, and corresponding grades.

After entering grades, they can type 'done' when prompted for the student's name.

Output Format

The output should display the (average of grades) calculated GPA with a precision of two decimal places.

The magical grades will be saved in a mystical file named "magical_grades.txt".

Refer to the sample output for format specifications.

Sample Test Case

Input: Alice
Math
95
English
88
done

Output: 91.50

Answer

```
# You are using Python
with open("magical_grades.txt", "w") as file:
    while True:
        name = input()
        if name.lower() == 'done':
            break
        sub1 = input()
        grade1 = int(input())
        sub2 = input()
        grade2 = int(input())
        file.write(f"{name},{sub1},{grade1},{sub2},{grade2}\n")
        gpa = (grade1 + grade2) / 2
        print(f"{gpa:.2f}")
```

Status : Correct ***Marks : 10/10***

2. Problem Statement

Implement a program that checks whether a set of three input values can form the sides of a valid triangle. The program defines a function is_valid_triangle that takes three side lengths as arguments and raises a ValueError if any side length is not a positive value. It then checks whether the sum of any two sides is greater than the third side to determine the validity of the triangle.

Input Format

The first line of input consists of an integer A, representing side1.

The second line of input consists of an integer B, representing side2.

The third line of input consists of an integer C, representing side3.

Output Format

The output prints either "It's a valid triangle" if the input side lengths form a valid triangle,

or "It's not a valid triangle" if they do not.

If there is a ValueError, it should print "ValueError: <error_message>".

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 3
4
5
Output: It's a valid triangle

Answer

```
# You are using Python
def is_valid_triangle(a, b, c):
    if a <= 0 or b <= 0 or c <= 0:
        raise ValueError("Side lengths must be positive")
    if (a + b > c) and (a + c > b) and (b + c > a):
        return True
```

```
    else:
        return False
try:
    a = int(input())
    b = int(input())
    c = int(input())
    if is_valid_triangle(a, b, c):
        print("It's a valid triangle")
    else:
        print("It's not a valid triangle")
except ValueError as ve:
    print(f"ValueError: {ve}")
```

Status : Correct **Marks : 10/10**

3. Problem Statement

Bob, a data analyst, requires a program to automate the process of analyzing character frequency in a given text. This program should allow the user to input a string, calculate the frequency of each character within the text, save these character frequencies to a file named "char_frequency.txt," and display the results.

Input Format

The input consists of the string.

Output Format

The first line prints "Character Frequencies:".

The following lines print the character frequency in the format: "X: Y" where X is the character and Y is the count.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: aaabbbccc
Output: Character Frequencies:

a: 3
b: 3
c: 3

Answer

```
# You are using Python
text = input()
freq = {}
for ch in text:
    freq[ch] = freq.get(ch, 0) + 1
with open("char_frequency.txt", "w") as f:
    f.write("Character Frequencies:\n")
    for ch, count in freq.items():
        f.write(f"{ch}: {count}\n")
print("Character Frequencies:")
for ch, count in freq.items():
    print(f"{ch}: {count}")
```

Status : Correct ***Marks : 10/10***

4. Problem Statement

Alex is creating an account and needs to set up a password. The program prompts Alex to enter their name, mobile number, chosen username, and desired password. Password validation criteria include:

Length between 10 and 20 characters.At least one digit.At least one special character from !@#$%^&* set. Display "Valid Password" if criteria are met; otherwise, raise an exception with an appropriate error message.

Input Format

The first line of the input consists of the name as a string.

The second line of the input consists of the mobile number as a string.

The third line of the input consists of the username as a string.

The fourth line of the input consists of the password as a string.

Output Format

If the password is valid (meets all the criteria), it will print "Valid Password"

If the password is weak (fails any one or more criteria), it will print an error message accordingly.

Refer to the sample outputs for the formatting specifications.

Sample Test Case

Input: John
9874563210
john
john1#nhoj
Output: Valid Password

Answer

```
name = input()
mobile = input()
username = input()
password = input().strip()

special_chars = set("!@#$%^&*")

if not any(ch.isdigit() for ch in password):
    print("Should contain at least one digit")
elif not any(ch in special_chars for ch in password):
    print("It should contain at least one special character")
elif len(password) < 10 or len(password) > 20:
    print("Should be a minimum of 10 characters and a maximum of 20
characters")
else:
    print("Valid Password")
```

Status : Partially correct ***Marks : 6.5/10***