Rajalakshmi Engineering College

Name: Soameshwaran D
Email: 240701520@rajalakshmi.edu.in
Roll no: 240701520
Phone: 7358671540
Branch: REC
Department: I CSE FE
Batch: 2028
Degree: B.E - CSE

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NeoColab_REC_CS23221_Python Programming

REC_Python_Week 6_CY

Attempt : 1
Total Mark : 40
Marks Obtained : 40

Section 1 : Coding

1. 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:
    side1 = int(input())
    side2 = int(input())
    side3 = int(input())

    if is_valid_triangle(side1, side2, side3):
        print("It's a valid triangle")
    else:
        print("It's not a valid triangle")

except ValueError as e:
```

```
    print(f"ValueError: {e}")
```

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

2. Problem Statement

Alice is developing a program called "Name Sorter" that helps users organize and sort names alphabetically.

The program takes names as input from the user, saves them in a file, and then displays the names in sorted order.

File Name: sorted_names.txt.

Input Format

The input consists of multiple lines, each containing a name represented as a string.

To end the input and proceed with sorting, the user can enter 'q'.

Output Format

The output displays the names in alphabetical order, each name on a new line.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: Alice Smith
John Doe
Emma Johnson
q
Output: Alice Smith
Emma Johnson
John Doe

Answer

```
# You are using Python
```

```
names = []

while True:
    name = input()
    if name == 'q':
        break
    names.append(name)

with open("sorted_names.txt", "w") as file:
    for n in names:
        file.write(n + "\n")

with open("sorted_names.txt", "r") as file:
    sorted_names = sorted(line.strip() for line in file)

for name in sorted_names:
    print(name)
```

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

3. Problem Statement

Write a program to read the Register Number and Mobile Number of a student. Create user-defined exception and handle the following:

If the Register Number does not contain exactly 9 characters in the specified format(2 numbers followed by 3 characters followed by 4 numbers) or if the Mobile Number does not contain exactly 10 characters, throw an IllegalArgumentException. If the Mobile Number contains any character other than a digit, raise a NumberFormatException.If the Register Number contains any character other than digits and alphabets, throw a NoSuchElementException.If they are valid, print the message ‘valid’ or else print an Invalid message.

Input Format

The first line of the input consists of a string representing the Register number.

The second line of the input consists of a string representing the Mobile number.

Output Format

The output should display any one of the following messages:

If both numbers are valid, print "Valid".

If an exception is raised, print "Invalid with exception message: ", followed by the specific exception message.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 19ABC1001
9949596920
Output: Valid

Answer

```
# You are using Python
class IllegalArgumentException(Exception):
    pass

class NoSuchElementException(Exception):
    pass

class NumberFormatException(Exception):
    pass

def validate_register_number(reg_num):
    if len(reg_num) != 9:
        raise IllegalArgumentException("Register Number should have exactly 9 characters.")

    if not (reg_num[:2].isdigit() and reg_num[2:5].isalpha() and reg_num[5:].isdigit()):
        raise IllegalArgumentException("Register Number should have the format: 2 numbers, 3 characters, and 4 numbers.")

    if not reg_num.isalnum():
        raise NoSuchElementException("Register Number should only contain alphabets and digits.")
```

```
def validate_mobile_number(mobile_num):
    if len(mobile_num) != 10:
        raise IllegalArgumentException("Mobile Number should have exactly 10
characters.")

    if not mobile_num.isdigit():
        raise NumberFormatException("Mobile Number should only contain digits.")

try:
    reg_num = input().strip()
    mobile_num = input().strip()

    validate_register_number(reg_num)
    validate_mobile_number(mobile_num)

    print("Valid")

except (IllegalArgumentException, NoSuchElementException,
NumberFormatException) as e:
    print(f"Invalid with exception message: {e}")
```

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

4. 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
from collections import OrderedDict

text = input()

freq = OrderedDict()
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***