

Rajalakshmi Engineering College

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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

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
```

```
def analyze_char_frequency(text):
    frequency = OrderedDict()
    for char in text:
        frequency[char] = frequency.get(char, 0) + 1

    with open("char_frequency.txt", "w", encoding="utf-8") as file:
        file.write("Character Frequencies:\n")
        for char, count in frequency.items():
            file.write(f"{char}: {count} ")

    print("Character Frequencies:")
    for char, count in frequency.items():
        print(f"{char}: {count}", end=" ")
```

```
if __name__ == "__main__":
    user_input = input()
    analyze_char_frequency(user_input)
```

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

if __name__ == "__main__":
    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 e:
        print(f"ValueError: {e}")

```

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

```
class IllegalArgumentException(Exception):  
    pass
```

```
class NumberFormatException(Exception):  
    pass
```

```
class NoSuchElementException(Exception):  
    pass
```

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

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

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

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

```

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

def main():
    try:
        register_number = input().strip()
        mobile_number = input().strip()

        validate_register_number(register_number)
        validate_mobile_number(mobile_number)

        print("Valid")
    except (IllegalArgumentException, NumberFormatException,
            NoSuchElementException) as e:
        print("Invalid with exception message:", e)

main()

```

Status : Correct

Marks : 10/10

4. Problem Statement

Write a program to obtain the start time and end time for the stage event show. If the user enters a different format other than specified, an exception occurs and the program is interrupted. To avoid that, handle the exception and prompt the user to enter the right format as specified.

Start time and end time should be in the format 'YYYY-MM-DD HH:MM:SS'. If the input is in the above format, print the start time and end time. If the input does not follow the above format, print "Event time is not in the format "

Input Format

The first line of input consists of the start time of the event.

The second line of the input consists of the end time of the event.

Output Format

If the input is in the given format, print the start time and end time.

If the input does not follow the given format, print "Event time is not in the format".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 2022-01-12 06:10:00

2022-02-12 10:10:12

Output: 2022-01-12 06:10:00

2022-02-12 10:10:12

Answer

```
# You are using Python
from datetime import datetime
```

```
def main():
    try:
        start_time = input().strip()
        end_time = input().strip()
        start_dt = datetime.strptime(start_time, '%Y-%m-%d %H:%M:%S')
        end_dt = datetime.strptime(end_time, '%Y-%m-%d %H:%M:%S')
        print(start_time, end_time)
    except ValueError:
        print("Event time is not in the format")
```

```
main()
```

Status : Correct

Marks : 10/10