Operating Systems

Assignment 3

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(BS CS 01 SEC B)

Date: 04.01.2023

TASK:

You have to create four threads other than main thread.

1. **Input thread**
2. **Reverse thread**
3. **Capital thread**
4. **Shift thread**

Input thread will take string input from user, reverse thread will reverse the string and output it, capital thread will capitalize the characters of string and output it and shift thread will shift each characters of the string two time (e.g. a will become c) and output it. All the threads wait for input thread when input thread finishes his task all the waiting thread start their work simultaneously. You also have to handle the exceptions of input thread. Also take care the state of each thread. Do not waste your memory resources.

Code:

```
import threading

def input_func():
    global input_string
    try:
        input_string = str(input("Enter a string: "))
        print("\t ____________________________________\n")
    except ValueError:
        input_string = ""
        print("\tThe string is empty. Try again.")
        input_string = str(input("Enter a valid string: "))
    return input_string

def reverse_func():
    print("\t=> Reversed Input String: ", input_string[::-1])

def capitalize_func():
    print("\t=> Capitalized Input String: ", input_string.upper())

def shift_func():
    shifted_string = ""
    for letter in input_string:
        if letter == " ":
            shifted_string += " "
        elif ord(letter) + 2 > ord("9") and letter.isdigit():
            shifted_string += chr(ord(letter) + 2 - 10)
```

```
            elif ord(letter) + 2 > ord("z") and letter.islower():
                shifted_string += chr(ord(letter) + 2 - 26)
            elif ord(letter) + 2 > ord("Z"):
                shifted_string += chr(ord(letter) + 2 - 26)
        print("\t=> +2 Character Shifted Input String: ", shifted_string,
)
        print("\t  _____\n")
if __name__ == "__main__":
    Input_Thread = threading.Thread(target=input_func)
    Reverse_Thread = threading.Thread(target=reverse_func)
    Capital_Thread = threading.Thread(target=capitalize_func)
    Shift_Thread = threading.Thread(target=shift_func)

    Input_Thread.start()
    Input_Thread.join()

    Reverse_Thread.start()
    Reverse_Thread.join()

    Capital_Thread.start()
    Capital_Thread.join()

    Shift_Thread.start()
    Shift_Thread.join()
```

Screenshot of the output: