

### Client-Server Communication Assignment

Your task is to modify your Java application from Lab 6, in a server-client scenario, using the TCP protocol. The communication between the server and the client is detailed in the steps below:

1. The server starts listening to a TCP port.
2. The client connects to the port.
3. Once the connection has been established, the server sends the URL where the file resides to the client. The URL is: <https://homes.izmirekonomi.edu.tr/eokur/sample0.txt>.
4. The client reads the file located at the given URL, and asks the user for the transformation preferences:
  - a. U for upper case, L for lower case
  - b. An integer between 1-3 (inclusive) for the shift amount
  - c. R for red, Y for yellow.
5. The client then sends the following to the server:
  - a. The length of the data in the file
  - b. The user preferences specified in the step above.
6. The client now starts sending each character in the string, to the server. The server, after receiving the character, transforms it in 3 different ways (case, shift, color), based on user preferences. Finally, the server sends the transformed strings back to the client. No thread mechanisms necessary!
7. The client forms a `HashMap` using the transformed strings received from the server. Finally, the client displays the contents of the `HashMap` onto the console screen.

See the example output log below for the illustration of the communication between the two sides.

```
1 Waiting for connection...
2 Connection established with: /127.0.0.1
3 Sending URL: https://homes.izmirkonomi.edu.tr/eokur/sample@.txt
5 Data length received: 20

5 User choices received: U, 1, R

6 Received char: S
6 Received char: y
6 Received char: s
6 Received char: t
6 Received char: e
6 Received char: m
6 Received char: P
6 Received char: r
6 Received char: o
6 Received char: g
6 Received char: r
6 Received char: a
6 Received char: m
6 Received char: m
6 Received char: i
6 Received char: n
6 Received char: g
6 Received char: L
6 Received char: a
6 Received char: b

Process finished with exit code 0
```

SERVER-SIDE

```
2 Attempting connection to the server...
3 Received https://homes.izmirkonomi.edu.tr/eokur/sample@.txt
4 Data: SystemProgrammingLab
4 Please state your choice.. UPPER case or lower case (U or L): U
4 Please state your choice.. How many characters to shift (number between 1-3): 1
4 Please state your choice.. Color of characters (R or Y): R
5 Sending data length to server: 20
5 Sending user choices to server: U, 1, R
7 Original
7 SystemProgrammingLab
7 After Case Change
7 SYSTEMPROGRAMMINGLAB
7 After Shift
7 TztufnQspsbnnjohMbc
7 After Color
7 SystemProgrammingLab
```

CLIENT-SIDE

Process finished with exit code 0