National University of Computer and Emerging Sciences

# Computer Networks Lab

Date: October 18th 2024

**Lab Instructor(s)**

Ms. Saira Arif

# Sessional-I Exam

**Total Time: 90 mins**

**Total Marks: 20**

**Total Questions: 01**

**Semester:** Fall-2024

**Campus:** Lahore

**Dept:** Data Science

| Student Name | Roll No | Section | Student Signature |
|---|---|---|---|

**"String Manipulation Adventure: Encrypt, Decrypt, and Communicate!"**

***Question Statement*** **(20)**

You are required to implement a server-client application using Python. The task involves manipulating a string based on user input and performing encryption and decryption using custom logic. Special characters should be **ignored** during the shifts. Follow the instructions below carefully:

**Task Overview:**

- The **server** will always be running and will accept connections from only **one client at a time**.

**Steps to Follow:**

1. **Client Input**:
   - The client will prompt the user to input a string with **at least 30 characters**.
   - If the string has fewer than 30 characters, the program should display an error message and ask for input again.
2. **String Splitting**:
   - Once a valid string is entered, the client will send it to the server and print the message that string has even/odd length.
   - The server will split the string into two halves:

- If the length of the string is **odd**, the first half will contain one more character than the second half.
- If the length is **even**, both halves will be of equal length.

3. **Encryption and Decryption**:
   - The server will encrypt the first half by shifting each character **right by 5 positions**.
   - The server will decrypt the second half (which is already encrypted) by shifting each character **left by 4 positions**.
   - Both resulting strings should be printed by the server on **separate lines**.
   - **Special characters** should remain unchanged during the shift.
4. **Error Handling**:
   - Ensure that the string input is validated at the client side (at least 30 characters).

***Note:***

- You **cannot** use built-in functions like translate() or maketrans() for this task. Implement your own logic to handle character manipulation.

***Examples:***

- ***Input***: If the client enters the string **"Exploring new ideas can be rewardingPievrmrk Tcxlsr mw jyr erh ibgmxmrk! ".**
  - The first half after encryption will be "Jcuqtwnsl sjb nijfx hfs gj wjbfwinsl".
  - The second half after decryption will be "Learning Python is fun and exciting!"