**Assignment 02**

**Build an application that tests network connectivity with TcpListener and TcpClient**

# Assignment Objectives

In this assignment, you will:

# Reliable TCP Connection: Ensure stable and secure connections between client and server.

# Efficient Messaging Feature: Enable quick and accurate sending and receiving of messages.

# High Data Security: Encrypt exchanged information to protect data from security threats.

# User-Friendly Interface: Provide an easy-to-use and intuitive interface for users.

# Scalable and Flexible Functionality: The application should support a range of features like group chat, file transfer, and connection statistics.

# Main Functions

# TCP Connection: Establishes TCP connection between client and server.

# Send Message: Clients can send messages to the server.

# Receive Message: Server receives and processes messages from clients.

# Display Connection Status: Both server and client show the current connection status.

# Login/Logout: Authenticates user on the client before connecting.

# Data Encryption: Encrypts information sent between client and server.

# Logging: Logs activities and errors into a log file.

# Connection Configuration: Allows users to configure connection settings like IP address and port.

# File Transfer: Enables users to send and receive files through TCP.

# Connection Statistics: Collects statistics of incoming and outgoing connections, including time and data volume.