Packet Loss (Client)

Description:

Write a Python program that simulates UDP-based communication between a client and a server. The client sends a string one character at a time, with each character sent in a separate UDP packet.

The server listens on IP address 127.0.0.1 and port 9876, and receives each character and rebuilds the original string until it receives the special end-of-message character ('\0'). For simulation purposes, the server intentionally drops every 10th packet to mimic packet loss.

Once the full message is received, the server sends the reconstructed string back to the client. The client must then compare this received message to the original string and detect which characters were lost during transmission.

Message sent by the client:
K^sXjF@WeuQ{=nZrGMdVYtc#]Pk|a?o>Rb&Lq(ASz$Tw}iC+MJ*<!gHEhBfNUOdy

Input:

None (all parameters are hard-coded or passed in run mode)

Output (without unit test):

Connected to server on port 9876

Received from server:

^sXjF@Weu{=nZrGMdVtc#]Pk|a?>Rb&Lq(AS$Tw}iC+MJ<!gHEhBfNOdy

Lost characters:

KQYoz*U

Connection closed.

Output (with unit test):

✅ Used UDP socket

✅ All sendto() calls used correct server address

✅ Output matched expected lost characters

✅ test_send_packet_udp passed all checks