How to write a chat program with UDP?

Each client has two variables with initial value 0. One variable records its own sequence number which means the id of the current sent message. The other records the sequence number of the other client which means the id of the just received messages. When sending messages, each client adds its own sequence number before the message and inceases its own sequence number by 1. When receiving messages, each client should receive message with ascending sequence numbers. However, in real cases, due to bad network connections and UDP protocals, the client may receive messages with disordered sequence numbers. If the client displays the message once the message is received, the messages may be displayed in wrong order. A solution to this is to set up a buffer. When receiving messages, client puts messages in the buffer. If the sequence number of the received message is larger than the correlating variable by 1, display the message to the user. If not, stop displaying the received messages to the user. The client keeps not displaying messages to users until the message with the wanted sequence number is received or the waiting time exceeds a limit. If the wanted message is received, display the messages in the buffer to the user in the order where the sequence numbers increase by one. If the waiting time exceeds the limit (the message is considered to be lost via transmission), ignore the message or send a re-send request to the other client. Then display the messages in the buffer to the user in the order where the sequence numbers increase by one.(If some sequence numbers miss, repeat the above process)

Can we use the UDP to transfer a file?

Yes, we can. Two important factors in file transfer are sequence and loss. We can use sequence number to label file packages. If some file packages are lost via transmission, the correlating sequence number is not received as well. Thus we can send a re-sent request to the server. After receiving all packages, we can join the file packages in a correct order using sequence number.