Implementation of a Sliding Window ARQ protocol in C/C++

1. Implement an application layer reliable protocol using Sliding Window ARQ (Selective Repeat) in C/C++. Use the underlying UDP transport protocol for sending the application layer messages. (10 Points)
    - Use the following segment format for your protocol implementation. You can refer to the FSM for the GbackN protocol as a reference and implement the functionalities of Selective Repeat.

```
packetType::DataPack
{     packetType.
      sequenceNum,
      packetChecksum,
      payloadLength,
      payload.
} \\*payload of this packet contains the file content.
packetType::Ack
{     packetType,
      RecSequenceNum,
      packetChecksum,
} \\*ACK packet send by the client
```

    a. Split the file into fixed size segments (except the last one) and append the header before sending.
    b. Handle the packet loss and time out according to the protocol

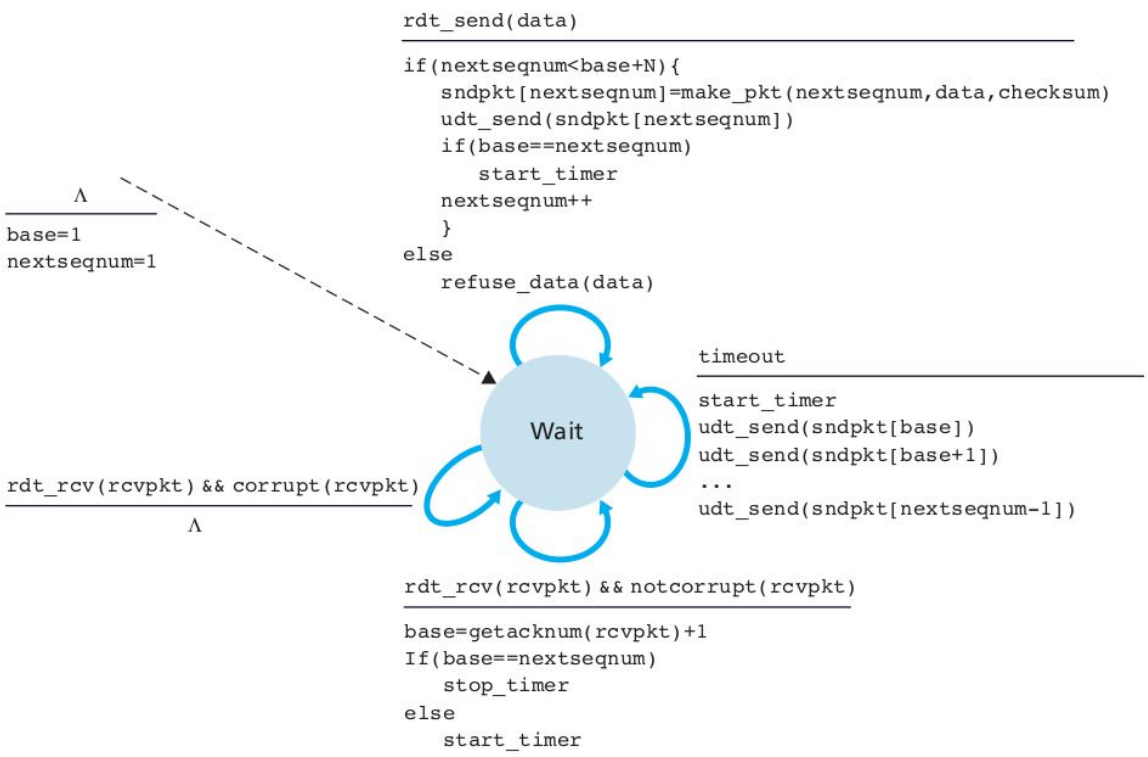

Figure 3.20 ♦ Extended FSM description of GBN sender

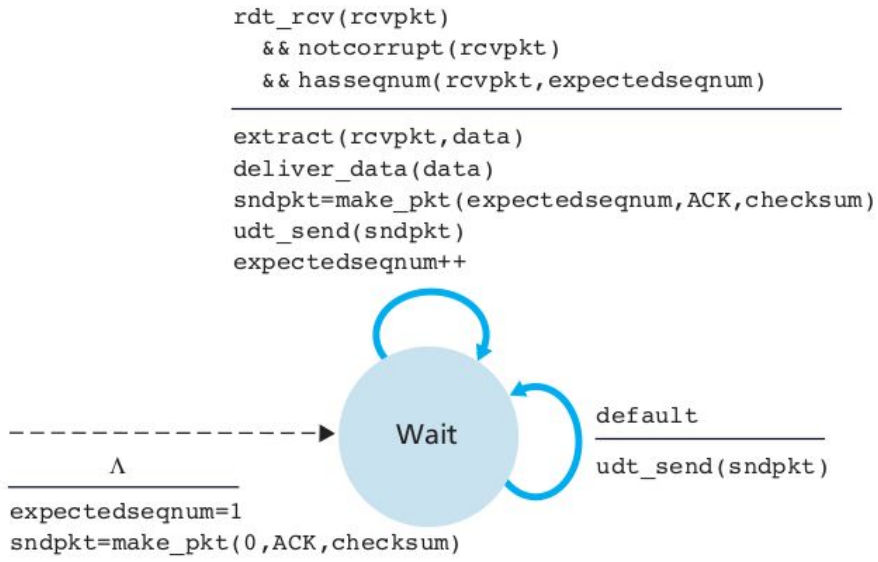

Figure 3.21 ♦ Extended FSM description of GBN receiver

*Image source - "Computer Networking : A Top-Down Approach, 6th edition"

2. Test your protocol by transfering a large file using the developed protocol. (5 Points)
    a. Study the effect of window size on the achieved throughput for different RTT (20ms, 50ms, 100ms).
    b. What is the %improvement on throughput (for various window size) compared to stop and wait protocol (window size of 1 will give the throughput for stop and wait)

Important Note:

- **Complete the assignment in the lab and get it evaluated by a TA. The assignment should be done individually. You can discuss with the TAs in case you need some help. Do not copy any code from Internet or from other students. In case, you could not complete, get it evaluated for the part you have completed.**
- **The submissions will be checked for plagiarism against current and previous year batch's submissions. Refer to the Anti-Plagiarism Policy given below. (https://cse.iith.ac.in/academics/plagiarism-policy.html).**