

GoBack N Program:

```
import random

a = list(map(int,input("\nEnter the numbers in the frame in a sequence with blank spaces between
two numbers: ").strip().split()))

n = int(input("Enter window size: "))

count = int(len(a) / 4)

i = 0

while i < len(a):

    j = 0

    for _ in range(n) :

        if i < len(a):

            print("Sent frame " + str(a[i]))

            i,j = i + 1,j+1

        i = i - j

    for _ in range(n) :

        x = random.randint(0,1)

        if x == 0 and count != 0 and i < len(a):

            print("Frame " + str(a[i]) + " not recieved.Transmit the frame again")

            count = count - 1

            break

        elif i < len(a) :

            print ("Acknowledgment recieved for Frame " + str(a[i]))

            i = i + 1
```

Output:

Enter the numbers in the frame in a sequence with blank spaces between two numbers: 1 2 3 4 5 6 7
8 9

Enter window size: 4

Sent frame 1

Sent frame 2

Sent frame 3

Sent frame 4

Frame 1 not recieved.Transmit the frame again

Sent frame 1

Sent frame 2

Sent frame 3

Sent frame 4

Acknowledgment recieved for Frame 1

Acknowledgment recieved for Frame 2

Frame 3 not recieved.Transmit the frame again

Sent frame 3

Sent frame 4

Sent frame 5

Sent frame 6

Acknowledgment recieved for Frame 3

Acknowledgment recieved for Frame 4

Acknowledgment recieved for Frame 5

Acknowledgment recieved for Frame 6

Sent frame 7

Sent frame 8

Sent frame 9

Acknowledgment recieved for Frame 7

Acknowledgment recieved for Frame 8

Acknowledgment recieved for Frame 9

Selective Repeat Program:

```
import random

a = list(map(int,input("\nEnter the numbers in the frame in a sequence with blank spaces between
two numbers: ").strip().split()))

n = int(input("Enter window size: "))

count = int(len(a) / 2)

i = 0

while i < len(a):

    j = 0

    for _ in range(n) :

        if i < len(a):

            print("Sent frame " + str(a[i]))

            i,j = i + 1,j+1

    i = i - j

    for _ in range(n) :

        x = random.randint(0,1)

        if x == 0 and count != 0 and i < len(a):

            print("Frame " + str(a[i]) + " not recieved.Transmit the frame again")

            count = count - 1

            a.insert(i+n,a[i])

            i = i + 1

    elif i < len(a) :

        print ("Acknowledgment recieved for Frame " + str(a[i]))

        i = i + 1
```

Output:

Enter the numbers in the frame in a sequence with blank spaces between two numbers: 1 2 3 4 5 6 7 8

Enter window size: 4

Sent frame 1

Sent frame 2

Sent frame 3

Sent frame 4

Frame 1 not recieved.Transmit the frame again

Frame 2 not recieved.Transmit the frame again

Frame 3 not recieved.Transmit the frame again

Acknowledgment recieved for Frame 4

Sent frame 1

Sent frame 2

Sent frame 3

Sent frame 5

Frame 1 not recieved.Transmit the frame again

Acknowledgment recieved for Frame 2

Acknowledgment recieved for Frame 3

Acknowledgment recieved for Frame 5

Sent frame 1

Sent frame 6

Sent frame 7

Sent frame 8

Acknowledgment recieved for Frame 1

Acknowledgment recieved for Frame 6

Acknowledgment recieved for Frame 7

Acknowledgment recieved for Frame 8

Assignment 3

Q1 write a note on flow control and error control.

Ans Flow Control:

Co-ordinates the amount of data that can be sent before receiving an acknowledgement

- Important duty of data link layer.
- It makes sender wait for some sort of an acknowledgement before continuing to send data.

Error Control:

It's based on automatic repeat request.

- Refers to methods of error detection and retransmission.
- When error is detected, specified frame are retransmitted.

Q2 What is sliding window protocol?

Ans Sliding window protocol are data link layer protocols for reliable and sequential delivery of data frames. Multiple frames can be sent by the sender at a time before receiving an ACK from receiver. Sliding window refers to imaginary boxes to hold frames.

There are two types of sliding window protocol

- 1] Go Back N ARQ
- 2] Selective Repeat ARQ.

Q3 Explain in brief selective repeat and go back N

Ans Selective Repeat ARQ:

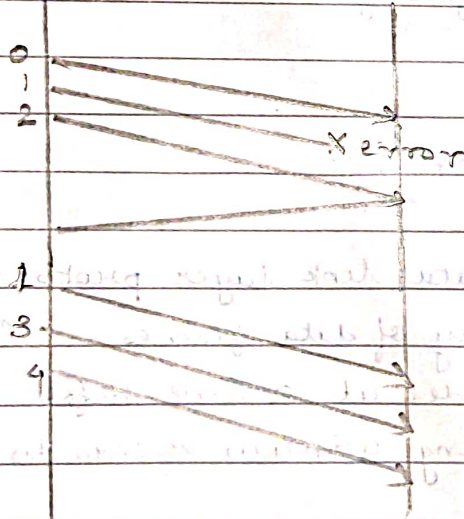
It is data link layer protocol that uses a sliding window method. In this if any frame is corrupted or lost, ~~all~~ only the lost frames are retransmitted. If the receiver receives a corrupt frame, it does not directly discard it. It sends a negative acknowledgement to the sender. The sender sends the frame again on receiving the acknowledgement.

Go Back N ARQ:

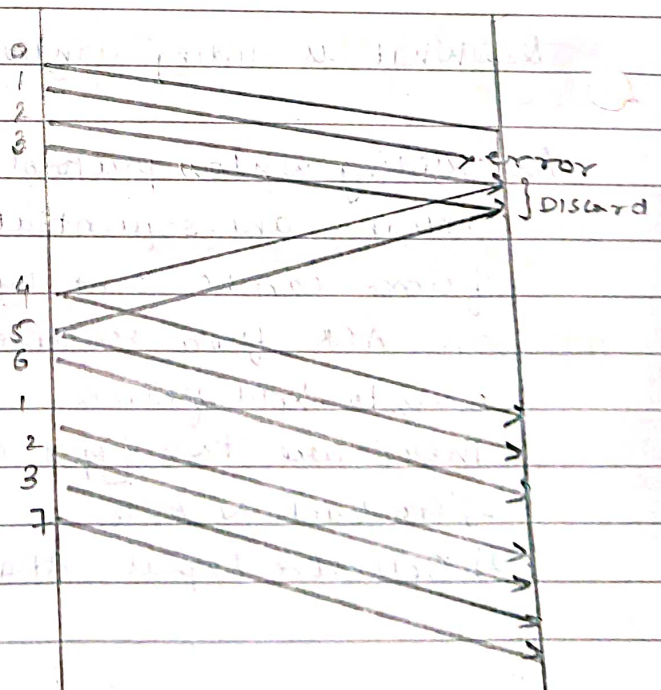
It is a data link layer protocol that uses a sliding window protocol. In this any frame is corrupted or lost, all subsequent frames have to sent again.

Sender

Receiver



Selective Repeat



Go Back N