Sender side

import socket

import random

import time

s = socket.socket()

s.bind(("localhost",8020))

s.listen(5)

c, adr = s.accept()

print(str(adr))

n  = int(input("Enter number of frames:"))

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

seq = 1

frame = 1  # frame to send starts with 1

# send first N window size frames

for i in range(N):

    print('Frames sent ->',frame)

    c.send(str(frame).encode())

    frame += 1

    time.sleep(3)

timer = 5

# will start with acknowledgement frame of 1

while frame < n :

    t = random.randint(1,7)

    msg = c.recv(1).decode()

    msg = int(msg)

    print("received -->",msg)

    if(msg == seq and timer > t):

        print("acknowledged")

        print('Frames sent ->',str(frame))

        c.send(str(frame).encode())

        seq += 1

        frame += 1

    else:

        print('failed to receive acknowledgement')

        frame = seq

        for i in range(N):

            print('Frames sent ->',frame)

            c.send(str(frame).encode())

            frame += 1

    time.sleep(3)

receiver side

import socket

import time

s=socket.socket()

s.connect(("localhost", 8020))

while 1:

    msg=s.recv(1).decode()

    print("Received --> ",int(msg))

    s.send(str(msg).encode())