



## HKUSTx: ELEC1200.3x A System View of Communications: From Signals to Packets (Part 3)



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**LAB 3 - TASK 4 (EXTERNAL RESOURCE)** (1.0 points possible)


## 6.1 Stop-and-Wait Protocol

Week 3 Quiz due Feb 15, 2016 at 15:30 UTC 


## 6.2 Throughput of Stop-and-Wait

Week 3 Quiz due Feb 15, 2016 at 15:30 UTC 

## 6.3 Sliding Window Protocol

Week 3 Quiz due Feb 15, 2016 at 15:30 UTC 

## 6.4 Lab 3: Transport Layer

Lab due Feb 15, 2016 at 15:30 UTC 

► MATLAB download and tutorials

# Lab 3 - Task 4

In this task, you will implement the sender function of the stop-and-wait protocol.

## INSTRUCTIONS

The MATLAB code in the window below is similar to that in Task 1, but you will implement the function **sender\_stopwait()**. As described in Task 1, this function sends the packets contained in the variable **send\_packet\_list** to the receiver using the stop-and-wait protocol.

In order to implement this protocol, the sender maintains several variables:

1. **num\_packets** stores the total number of packets to be sent
2. **send\_packet\_num** indicates the sequence number of the packet that is to be sent or be acknowledged
3. if an acknowledgment has been received, **ack\_num** indicates the sequence number of that has been acknowledged
4. **send** is a boolean flag indicating whether to send a packet or not.

In each iteration, the sender should first check whether to send a packet or not. There are two conditions that may trigger a transmission/retransmission:

(1) The timeout expires while the sender is waiting for the acknowledgement of the current packet back. The sender checks whether the timeout has expired using the command **timeoutExpired()**, true if the timeout has expired, and false otherwise. If the timeout has expired, the sender should retransmit packet number **send\_packet\_num**, by setting **send** equal to true.

(2) An acknowledgement comes back. The sender checks for an acknowledgement using the command **send\_ack = sender\_get\_ack()**. If an acknowledgement has arrived, then **send\_ack** contains the acknowledgement packet, otherwise it is empty. The acknowledgement packet contains the 8 bit sequence number of the acknowledged packet. This can be converted into a decimal sequence number **ack\_num** using the command **binvec2dec(send\_ack)**. If the acknowledgement packet's sequence number (**ack\_num**) is the same as the sequence number of the acknowledgement that the sender is waiting for (**send\_packet\_num**), then the sender should increment **send\_packet\_num** to indicate that the next packet should be sent. If **send** is false, then set **send** equal to true to trigger a send. However, if **ack\_num** is equal to **num\_packets**, then there are no more packets to send, and the sender should trigger the simulation to stop by setting **run** equal to false.

If a packet should be sent (**send** = true), then the sender should get packet number **send\_packet\_num** from the matrix **send\_packet\_list** and transmit it using the command **sender\_send\_packet(packet)**. Then reset the timeout timer to wait for **time\_out** iterations with the command **resetTimeout(time\_out)**.

Your task is to revise the code to implement the sender. Specifically, you will implement the code to

%%% Revise the following code %%%


and

%%% Do not change the code below %%%

Please do not change other parts of the code.

## Your Solution

 Reset

 MATLAB Documentation (<https://www.mathworks.com>)

```

38 if isempty(send_ack)
39     ack_num = binvec2dec(send_ack);
40     if ack_num == send_packet_num,
41         % successful package reception, send next packet
42         send_packet_num = send_packet_num + 1;
43         send = true;
44     end
45     if ack_num == num_packets;
46         % stop because all packets received

```



## Assessment Tests: Passed

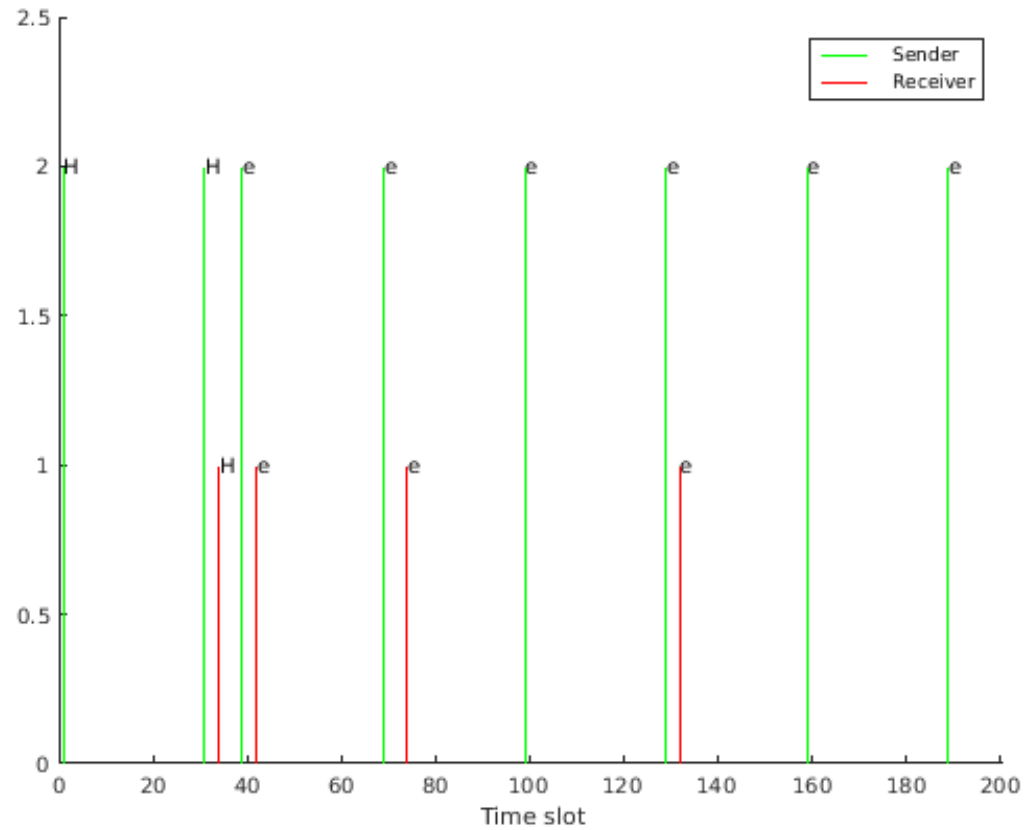
✓ Is the problem unchanged?

✓ Is the sender correct?

## Output

```
rx_msg =
```

```
Heeeelllloo!
```















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