TEAM POTATO Milestone 2

In this milestone, we were asked to model acknowledgements from the receiver after a packet has been sent. If the transfer was successful, an ACK acknowledgement is sent. If the transfer was not successful, a NAK acknowledgement is sent, and the previous packet is resent.

Below is the trace for successfully transferring 6 packets in 8 states (i.e. there is one NAK), and another trace where the data is not successfully transferred because it runs out of states.

State 0 ACK Data0 Data1 Data2 Data3 Data4 Data5 NAK (action) (senderBuffer) (senderBuffer) (senderBuffer) (senderBuffer) (senderBuffer) (senderBuffer) State 1 ACK Data0 Data2 Data3 Data4 Data5 Data1 NAK (action) (senderBuffer) (senderBuffer) (senderBuffer) (senderBuffer) (senderBuffer) (receiverBuffer) State 2 ACK Data0 Data1 Data2 Data3 Data4 Data5 NAK (action) (senderBuffer) (senderBuffer) (senderBuffer) (senderBuffer) (receiverBuffer) (receiverBuffer) State 3 ACK Data0 Data1 Data2 Data3 Data4 Data5 NAK (receiverBuffer) (senderBuffer) (receiverBuffer) (action) (senderBuffer) (senderBuffer) (receiverBuffer) State 4 Data3 NAK Data0 Data1 Data2 Data4 Data5 ACK (senderBuffer) (senderBuffer) (receiverBuffer) (receiverBuffer) (receiverBuffer) (receiverBuffer) (action) State 5 ACK Data1 Data2 Data3 Data4 Data0 Data5 NAK (senderBuffer) (receiverBuffer) (receiverBuffer) (action) (senderBuffer) (receiverBuffer) (receiverBuffer) State 6 Data2 ACK Data0 Data1 Data3 Data4 Data5 NAK (senderBuffer) (receiverBuffer) (receiverBuffer) (receiverBuffer) (receiverBuffer) (receiverBuffer) (action)

State 7

| ACK (action) | | Data0 (receiverBuffer) | | Data1 (receiverBuffer) | | Data2 (receiverBuffer) | | Data3 (receiverBuffer) | | Data4 (receiverBuffer) | | Data5 (receiverBuffer) | NA | AK | |
|-----------------|--|---------------------------|--|---------------------------|--|---------------------------|--|---------------------------|--|---------------------------|--|---------------------------|----|----|--|
|-----------------|--|---------------------------|--|---------------------------|--|---------------------------|--|---------------------------|--|---------------------------|--|---------------------------|----|----|--|

| State | Send Buffer | Receiver Buffer | Acknowledgement |
|-------|-------------|-----------------|-----------------|
| 0 | 0,1,2,3,4,5 | - | ACK |
| 1 | 0,1,2,3,4 | 5 | ACK |
| 2 | 0,1,2,3 | 4,5 | ACK |
| 3 | 0,1,2 | 3,4,5 | ACK |
| 4 | 0,1 | 2,3,4,5 | NAK |
| 5 | 0,1 | 2,3,4,5 | ACK |
| 6 | 0 | 1,2,3,4,5 | ACK |
| 7 | - | 0,1,2,3,4,5 | ACK |

Now we move on to the trace where the data is not successfully transferred.



| State 0 | |
|--|----------|
| ACK (action) Data0 (senderBuffer) Data1 (senderBuffer) Data2 (senderBuffer) Data3 (senderBuffer) Data4 (senderBuffer) NAK | (|
| State 1 Data0 (senderBuffer) | |
| State 2 ACK Data0 Data1 Data2 Data3 Data4 Data5 (senderBuffer) (senderBuffer) (senderBuffer) (senderBuffer) (senderBuffer) (senderBuffer) | <u> </u> |
| State 3 ACK Data0 Data1 Data2 Data3 Data4 Data5 (senderBuffer) (s | _ |
| State 4 Data: Dat | |
| ACK (senderBuffer) (senderBuffer) (senderBuffer) (senderBuffer) (receiverBuffer) (receiverBuffer) (action) | , |

State 5

| ACK | Data0 | Data1 | Data2 | Data3 | Data4 | Data5 | NAK |
|-----|----------------|----------------|----------------|----------------|------------------|------------------|----------|
| | (senderBuffer) | (senderBuffer) | (senderBuffer) | (senderBuffer) | (receiverBuffer) | (receiverBuffer) | (action) |
| | | | S | tate 6 | | | |
| ACK | Data0 | Data1 | Data2 | Data3 | Data4 | Data5 | NAK |
| | (senderBuffer) | (senderBuffer) | (senderBuffer) | (senderBuffer) | (receiverBuffer) | (receiverBuffer) | (action) |
| | | | s | tate 7 | | | |
| ACK | Data0 | Data1 | Data2 | Data3 | Data4 | Data5 | NAK |
| | (senderBuffer) | (senderBuffer) | (senderBuffer) | (senderBuffer) | (receiverBuffer) | (receiverBuffer) | (action) |

| State | Send Buffer | Receiver Buffer | Acknowledgement |
|-------|-------------|-----------------|-----------------|
| 0 | 0,1,2,3,4,5 | - | ACK |
| 1 | 0,1,2,3,4 | 5 | NAK |
| 2 | 0,1,2,3,4 | 5 | ACK |
| 3 | 0,1,2,3 | 4,5 | NAK |
| 4 | 0,1,2,3 | 4,5 | NAK |
| 5 | 0,1,2,3 | 4,5 | NAK |
| 6 | 0,1,2,3 | 4,5 | NAK |
| 7 | 0,1,2,3 | 4,5 | NAK |

With this model of data transfer, all data will be successfully transferred if it is given enough time to do so. However, if there is some timeout mechanism (i.e. after 4 NAK's the sender stops attempting to send data), then data transfer may fail.