

Lab #4: Network Layer

Networked Systems – ENSF 462, Lab B02

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Sender Output:

The screenshot shows a VS Code editor with a dark theme. The Explorer sidebar on the left displays a project structure under 'PROJECTS_ETC' with folders 'hack-4-health-hackathon', 'NetworkedSystems', and 'Lab4'. Inside 'Lab4', there are files '_pycache_', 'Network.py', 'Receiver.py', 'Sender.py', and 'SWRDT.py'. 'Receiver.py' is selected and highlighted. The main editor area shows the content of 'Receiver.py', which is a Python script for a network receiver. The script includes comments and logic for receiving and processing messages. The bottom of the script shows the file path: `C:\Projects_etc\NetworkedSystems\Lab4\`. The Output window at the bottom displays the terminal output of the script, showing a sequence of messages sent and received, including acknowledgments (ACK) and timeouts. The output is as follows:

```
C:\Projects_etc\NetworkedSystems\Lab4>python Sender.py localhost 5678
Network: role is sender
Sent Message: sending message - 1
Send message 1
Receive ACK 1. Message successfully sent!
Receive message 1. Send ACK 1
Received Message: sending message - 1

Sent Message: sending message - 2
Send message 2
Receive out-of-order message 1. Send ACK 1
Receive ACK 2. Message successfully sent!
Receive message 2. Send ACK 2
Received Message: sending message - 2

Sent Message: sending message - 3
Send message 3
Receive ACK 2. Resend message 3 Ignored
Timeout! Resend message 3
Receive out-of-order message 2. Send ACK 2
Receive message 3. Send ACK 3
Timeout! Resend message 3
Receive ACK 3. Message successfully sent!
Received Message: sending message - 3

Sent Message: sending message - 4
Send message 4
Receive message 4. Send ACK 4
Receive ACK 4. Message successfully sent!
Received Message: sending message - 4

Sent Message: sending message - 5
Send message 5
Receive message 5. Send ACK 5
Receive ACK 5. Message successfully sent!
Received Message: sending message - 5

Sent Message: sending message - 6
Send message 6
Timeout! Resend message 6
Receive message 6. Send ACK 6
Receive ACK 6. Message successfully sent!
Received Message: sending message - 6

Sent Message: sending message - 7
Send message 7
Receive message 7. Send ACK 7
Receive ACK 7. Message successfully sent!
Received Message: sending message - 7

Sent Message: sending message - 8
Send message 8
Receive message 8. Send ACK 8
Receive ACK 8. Message successfully sent!
Received Message: sending message - 8

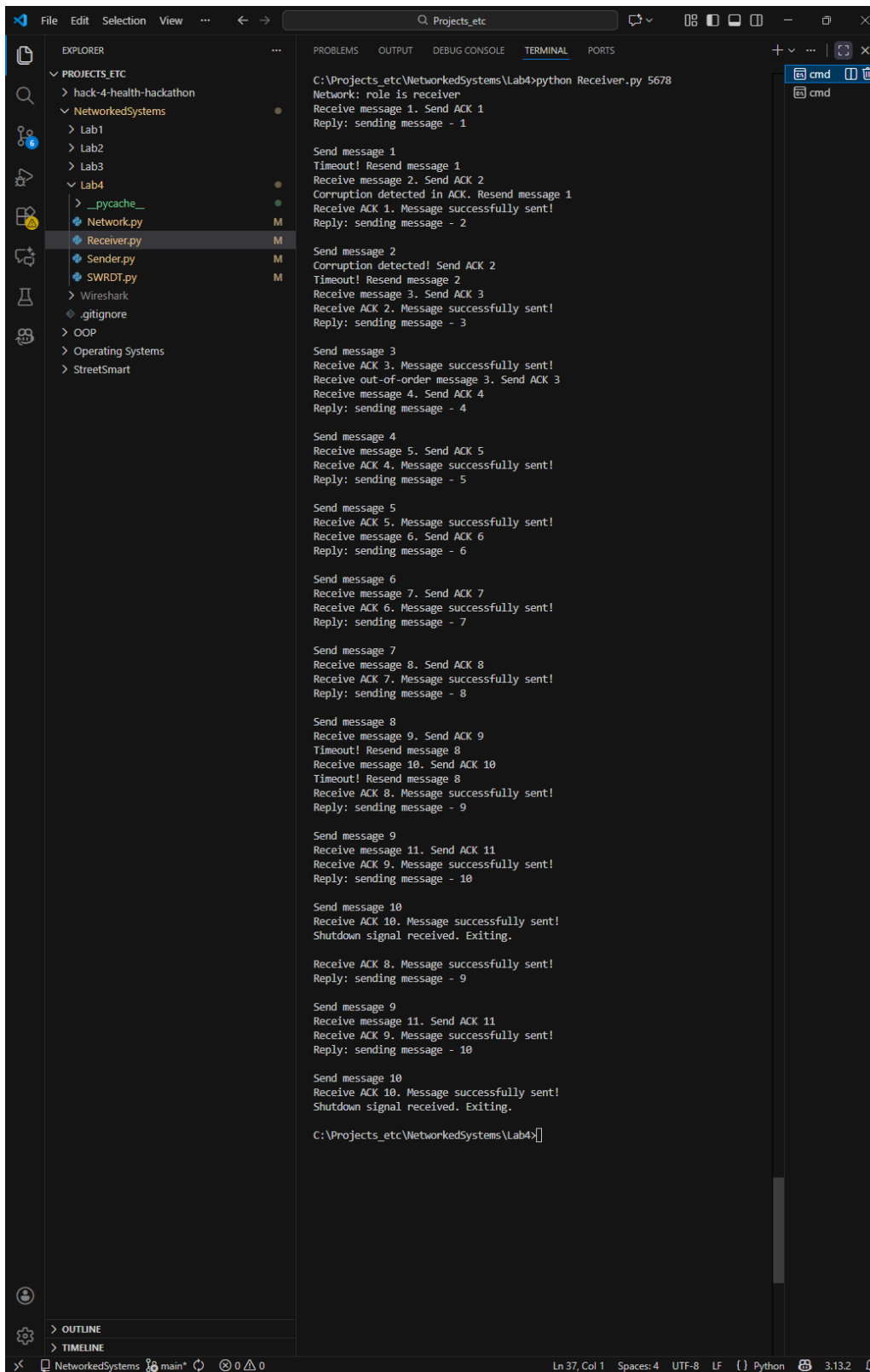
Sent Message: sending message - 9
Send message 9
Receive ACK 9. Message successfully sent!
NO ECHO RECEIVED (receiver timeout)

Sent Message: sending message - 10
Send message 10
Receive ACK 10. Message successfully sent!
Receive out-of-order message 8. Send ACK 8
Receive message 9. Send ACK 9
Received Message: sending message - 9

Send message 11
Receive message 10. Send ACK 10
Receive ACK 11. Message successfully sent!

C:\Projects_etc\NetworkedSystems\Lab4>
```

Receiver Output:



```
C:\Projects_etc\NetworkedSystems\Lab4>python Receiver.py 5678
Network: role is receiver
Receive message 1. Send ACK 1
Reply: sending message - 1

Send message 1
Timeout! Resend message 1
Receive message 2. Send ACK 2
Corruption detected in ACK. Resend message 1
Receive ACK 1. Message successfully sent!
Reply: sending message - 2

Send message 2
Corruption detected! Send ACK 2
Timeout! Resend message 2
Receive message 3. Send ACK 3
Receive ACK 2. Message successfully sent!
Reply: sending message - 3

Send message 3
Receive ACK 3. Message successfully sent!
Receive out-of-order message 3. Send ACK 3
Receive message 4. Send ACK 4
Reply: sending message - 4

Send message 4
Receive message 5. Send ACK 5
Receive ACK 4. Message successfully sent!
Reply: sending message - 5

Send message 5
Receive ACK 5. Message successfully sent!
Receive message 6. Send ACK 6
Reply: sending message - 6

Send message 6
Receive message 7. Send ACK 7
Receive ACK 6. Message successfully sent!
Reply: sending message - 7

Send message 7
Receive message 8. Send ACK 8
Receive ACK 7. Message successfully sent!
Reply: sending message - 8

Send message 8
Receive message 9. Send ACK 9
Timeout! Resend message 8
Receive message 10. Send ACK 10
Timeout! Resend message 8
Receive ACK 8. Message successfully sent!
Reply: sending message - 9

Send message 9
Receive message 11. Send ACK 11
Receive ACK 9. Message successfully sent!
Reply: sending message - 10

Send message 10
Receive ACK 10. Message successfully sent!
Shutdown signal received. Exiting.

Receive ACK 8. Message successfully sent!
Reply: sending message - 9

Send message 9
Receive message 11. Send ACK 11
Receive ACK 9. Message successfully sent!
Reply: sending message - 10

Send message 10
Receive ACK 10. Message successfully sent!
Shutdown signal received. Exiting.

C:\Projects_etc\NetworkedSystems\Lab4>
```