Sample outputs of the client/server program of Part 3 (with W set to 5 and PACKET DROP RATE and PACKET ERROR RATE set to 0.0) in transferring a small file.


```
atctam@atctamws: ~/Desktop/Dropbox/c3234/Project-2017/Part3
atctam@atctamws:~/Desktop/Dropbox/c3234/Project-2017/Part3$ python3 test-client3
.py localhost slidingW.png 0.0 0.0 5
Open file successfully
File bytes are  9205
Drop rate: 0.0  Error rate: 0.0        Window size: 5
rdt_send: Received the ACK with seqNo.: 0
rdt_send: Sent 1 message(s) of total size 4
rdt_send: Received the ACK with seqNo.: 1
rdt_send: Sent 1 message(s) of total size 12
rdt_recv: Got an expected packet - seqNo.:  0
rdt_recv: Received a message of size 10
Received server positive response
Start the file transfer . . .
rdt_send: Received the ACK with seqNo.: 2
rdt_send: Received the ACK with seqNo.: 3
rdt_send: Received the ACK with seqNo.: 4
rdt_send: Received the ACK with seqNo.: 5
rdt_send: Received the ACK with seqNo.: 6
rdt_send: Sent 5 message(s) of total size 5000
rdt_send: Received the ACK with seqNo.: 7
rdt_send: Received the ACK with seqNo.: 8
rdt_send: Received the ACK with seqNo.: 9
rdt_send: Received the ACK with seqNo.: 10
rdt_send: Received the ACK with seqNo.: 11
rdt_send: Sent 5 message(s) of total size 4205
Completed the file transfer.
Total elapse time: 0.021 s        Throughtput: 443.47 KB/s
rdt_close: Nothing happened for 0.500 second
rdt_close: Release the socket
Client program terminated
atctam@atctamws:~/Desktop/Dropbox/c3234/Project-2017/Part3$
```

```
atctam@atctamws: ~/Desktop/Dropbox/c3234/Project-2017/Part3
atctam@atctamws:~/Desktop/Dropbox/c3234/Project-2017/Part3$ python3 test-server3
.py localhost 0.0 0.0 5
Drop rate: 0.0  Error rate: 0.0        Window size: 5
rdt_recv: Got an expected packet - seqNo.:  0
rdt_recv: Received a message of size 10
Received client request: file size = 9205
rdt_recv: Got an expected packet - seqNo.:  1
rdt_recv: Received a message of size 18
Open file ./Store/slidingW.png for writing successfully
rdt_send: Received the ACK with seqNo.: 0
rdt_send: Sent 1 message(s) of total size 4
Start receiving the file . . .
rdt_recv: Got an expected packet - seqNo.:  2
rdt_recv: Received a message of size 1006
rdt_recv: Got an expected packet - seqNo.:  3
rdt_recv: Received a message of size 1006
rdt_recv: Got an expected packet - seqNo.:  4
rdt_recv: Received a message of size 1006
rdt_recv: Got an expected packet - seqNo.:  5
rdt_recv: Received a message of size 1006
rdt_recv: Got an expected packet - seqNo.:  6
rdt_recv: Received a message of size 1006
rdt_recv: Got an expected packet - seqNo.:  7
rdt_recv: Received a message of size 1006
rdt_recv: Got an expected packet - seqNo.:  8
rdt_recv: Received a message of size 1006
rdt_recv: Got an expected packet - seqNo.:  9
rdt_recv: Received a message of size 1006
rdt_recv: Got an expected packet - seqNo.:  10
rdt_recv: Received a message of size 1006
rdt_recv: Got an expected packet - seqNo.:  11
rdt_recv: Received a message of size 211
rdt_close: Nothing happened for 0.500 second
rdt_close: Release the socket
Completed the file transfer.
Server program terminated
atctam@atctamws:~/Desktop/Dropbox/c3234/Project-2017/Part3$
```

Part of the sample outputs of the client/server program of Part 3 (with W set to **5** and with PACKET DROP RATE and PACKET ERROR RATE set to **0.1**) in transferring a small file.

Left terminal — atctam@atctamws: ~/Desktop/Dropbox/c3234/Project-2017/Part3

```
atctam@atctamws:~/Desktop/Dropbox/c3234/Project-2017/Part3$ python3 test-client
3.py localhost slidingW.png 0.1 0.1 5
Open file successfully
File bytes are  9205
Drop rate: 0.1   Error rate: 0.1        Window size: 5
WARNING: udt_send: Packet lost in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 0 again
rdt_send: Received the ACK with seqNo.: 0
rdt_send: Sent 1 message(s) of total size 4
rdt_send: Received the ACK with seqNo.: 1
rdt_send: Sent 1 message(s) of total size 12
rdt_recv: Got an expected packet - seqNo.:  0
rdt_recv: Received a message of size 10
Received server positive response
Start the file transfer . . .
rdt_send: Received the ACK with seqNo.: 2
rdt_send: Received the ACK with seqNo.: 3
rdt_send: Received the ACK with seqNo.: 4
rdt_send: Received the ACK with seqNo.: 5
rdt_send: Timeout!! Retransmit the packet 6 again
rdt_send: Received the ACK with seqNo.: 6
rdt_send: Sent 5 message(s) of total size 5000
WARNING: udt_send: Packet corrupted in unreliable layer!!
WARNING: udt_send: Packet lost in unreliable layer!!
rdt_send: Received an ACK in previous window: 6
rdt_send: Received an ACK in previous window: 6
rdt_send: Received an ACK in previous window: 6
rdt_send: Timeout!! Retransmit the packet 7 again
WARNING: udt_send: Packet corrupted in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 8 again
rdt_send: Timeout!! Retransmit the packet 9 again
rdt_send: Timeout!! Retransmit the packet 10 again
WARNING: udt_send: Packet lost in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 11 again
rdt_send: Received the ACK with seqNo.: 7
rdt_send: Received an ACK in previous window: 7
rdt_send: Timeout!! Retransmit the packet 8 again
rdt_send: Timeout!! Retransmit the packet 9 again
rdt_send: Timeout!! Retransmit the packet 10 again
rdt_send: Timeout!! Retransmit the packet 11 again
rdt_send: Received the ACK with seqNo.: 8
rdt_send: Received the ACK with seqNo.: 9
rdt_send: Received the ACK with seqNo.: 10
rdt_send: Received the ACK with seqNo.: 11
rdt_send: Sent 5 message(s) of total size 4205
Completed the file transfer.
Total elapse time: 0.162 s     Throughtput: 56.77 KB/s
rdt_close: Nothing happened for 0.500 second
rdt_close: Release the socket
Client program terminated
atctam@atctamws:~/Desktop/Dropbox/c3234/Project-2017/Part3$
```

Right terminal — atctam@atctamws: ~/Desktop/Dropbox/c3234/Project-2017/Part3

```
rdt_recv: Got an expected packet - seqNo.:  1
rdt_recv: Received a message of size 18
Open file ./Store/slidingW.png for writing successfully
rdt_send: Received the ACK with seqNo.: 0
rdt_send: Sent 1 message(s) of total size 4
Start receiving the file . . .
rdt_recv: Got an expected packet - seqNo.:  2
rdt_recv: Received a message of size 1006
rdt_recv: Got an expected packet - seqNo.:  3
rdt_recv: Received a message of size 1006
rdt_recv: Got an expected packet - seqNo.:  4
rdt_recv: Received a message of size 1006
rdt_recv: Got an expected packet - seqNo.:  5
rdt_recv: Received a message of size 1006
rdt_recv: Got an expected packet - seqNo.:  6
WARNING: udt_send: Packet lost in unreliable layer!!
rdt_recv: Received a message of size 1006
rdt_recv: Received a retransmission DATA packet -seqNo.: 6 (expected: 7)
rdt_recv: Drop the packet
rdt_recv: Retransmit the ACK packet
rdt_recv: Received a corrupted packet: Type = DATA, Length = 1006
rdt_recv: Drop the packet
rdt_recv: Received an out-of-order DATA packet -seqNo.: 8 (expected: 7)
rdt_recv: Drop the packet
rdt_recv: Retransmit the ACK packet
rdt_recv: Received an out-of-order DATA packet -seqNo.: 9 (expected: 7)
rdt_recv: Drop the packet
rdt_recv: Retransmit the ACK packet
rdt_recv: Received an out-of-order DATA packet -seqNo.: 11 (expected: 7)
rdt_recv: Drop the packet
rdt_recv: Retransmit the ACK packet
rdt_recv: Got an expected packet - seqNo.:  7
rdt_recv: Received a message of size 1006
rdt_recv: Received a corrupted packet: Type = DATA, Length = 1006
rdt_recv: Drop the packet
rdt_recv: Received an out-of-order DATA packet -seqNo.: 9 (expected: 8)
rdt_recv: Drop the packet
rdt_recv: Retransmit the ACK packet
WARNING: udt_send: Packet lost in unreliable layer!!
rdt_recv: Received an out-of-order DATA packet -seqNo.: 10 (expected: 8)
rdt_recv: Drop the packet
rdt_recv: Retransmit the ACK packet
rdt_recv: Got an expected packet - seqNo.:  8
rdt_recv: Received a message of size 1006
rdt_recv: Got an expected packet - seqNo.:  9
rdt_recv: Received a message of size 1006
rdt_recv: Got an expected packet - seqNo.:  10
rdt_recv: Received a message of size 1006
rdt_recv: Got an expected packet - seqNo.:  11
rdt_recv: Received a message of size 211
rdt_close: Nothing happened for 0.500 second
rdt_close: Release the socket
Completed the file transfer.
Server program terminated
atctam@atctamws:~/Desktop/Dropbox/c3234/Project-2017/Part3$
```

Part of the sample outputs of the client/server program of Part 3 (with W set to 5 and with PACKET DROP RATE and PACKET ERROR RATE set to 0.3) in transferring a small file.

Left terminal (client):

```
atctam@atctamws: ~/Desktop/Dropbox/c3234/Project-2017/Part3
WARNING: udt_send: Packet lost in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 11 again
WARNING: udt_send: Packet corrupted in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 8 again
WARNING: udt_send: Packet lost in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 9 again
WARNING: udt_send: Packet corrupted in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 10 again
rdt_send: Timeout!! Retransmit the packet 11 again
rdt_send: Received a corrupted packet: Type = ACK, Length = 6
rdt_send: Drop the packet
WARNING: udt_send: Packet corrupted in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 8 again
WARNING: udt_send: Packet corrupted in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 9 again
WARNING: udt_send: Packet corrupted in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 10 again
WARNING: udt_send: Packet corrupted in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 11 again
rdt_send: Timeout!! Retransmit the packet 8 again
rdt_send: Timeout!! Retransmit the packet 9 again
WARNING: udt_send: Packet lost in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 10 again
rdt_send: Timeout!! Retransmit the packet 11 again
rdt_send: Received the ACK with seqNo.: 8
rdt_send: Received the ACK with seqNo.: 9
WARNING: udt_send: Packet corrupted in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 10 again
rdt_send: Timeout!! Retransmit the packet 11 again
rdt_send: Received an ACK in previous window: 9
WARNING: udt_send: Packet corrupted in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 10 again
WARNING: udt_send: Packet lost in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 11 again
rdt_send: Timeout!! Retransmit the packet 10 again
WARNING: udt_send: Packet lost in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 11 again
rdt_send: Received the ACK with seqNo.: 10
rdt_send: Timeout!! Retransmit the packet 11 again
WARNING: udt_send: Packet lost in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 11 again
WARNING: udt_send: Packet lost in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 11 again
WARNING: udt_send: Packet corrupted in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 11 again
rdt_send: Timeout!! Retransmit the packet 11 again
rdt_send: Timeout!! Retransmit the packet 11 again
rdt_send: Received the ACK with seqNo.: 11
rdt_send: Sent 5 message(s) of total size 4205
Completed the file transfer.
Total elapse time: 1.499 s      Throughput: 6.14 KB/s
rdt_close: Nothing happened for 0.500 second
rdt_close: Release the socket
Client program terminated
atctam@atctamws:~/Desktop/Dropbox/c3234/Project-2017/Part3$
```

Right terminal (server):

```
atctam@atctamws: ~/Desktop/Dropbox/c3234/Project-2017/Part3
rdt_recv: Retransmit the ACK packet
WARNING: udt_send: Packet corrupted in unreliable layer!!
rdt_recv: Received a corrupted packet: Type = DATA, Length = 1006
rdt_recv: Drop the packet
rdt_recv: Received a corrupted packet: Type = DATA, Length = 1006
rdt_recv: Drop the packet
rdt_recv: Received a corrupted packet: Type = DATA, Length = 1006
rdt_recv: Drop the packet
rdt_recv: Received a corrupted packet: Type = DATA, Length = 1006
rdt_recv: Drop the packet
rdt_recv: Received an out-of-order DATA packet -seqNo.: 11 (expected: 9)
rdt_recv: Drop the packet
rdt_recv: Retransmit the ACK packet
WARNING: udt_send: Packet corrupted in unreliable layer!!
rdt_recv: Received a corrupted packet: Type = DATA, Length = 1006
rdt_recv: Drop the packet
rdt_recv: Received a corrupted packet: Type = DATA, Length = 1006
rdt_recv: Drop the packet
rdt_recv: Received a corrupted packet: Type = DATA, Length = 1006
rdt_recv: Drop the packet
rdt_recv: Received a corrupted packet: Type = DATA, Length = 211
rdt_recv: Drop the packet
rdt_recv: Received a retransmission DATA packet -seqNo.: 8 (expected: 9)
rdt_recv: Drop the packet
rdt_recv: Retransmit the ACK packet
rdt_recv: Got an expected packet - seqNo.: 9
rdt_recv: Received a message of size 1006
rdt_recv: Received an out-of-order DATA packet -seqNo.: 11 (expected: 10)
rdt_recv: Drop the packet
rdt_recv: Retransmit the ACK packet
WARNING: udt_send: Packet lost in unreliable layer!!
rdt_recv: Received a corrupted packet: Type = DATA, Length = 1006
rdt_recv: Drop the packet
rdt_recv: Received an out-of-order DATA packet -seqNo.: 11 (expected: 10)
rdt_recv: Drop the packet
rdt_recv: Retransmit the ACK packet
rdt_recv: Received a corrupted packet: Type = DATA, Length = 1006
rdt_recv: Drop the packet
rdt_recv: Got an expected packet - seqNo.: 10
rdt_recv: Received a message of size 1006
rdt_recv: Got an expected packet - seqNo.: 11
WARNING: udt_send: Packet lost in unreliable layer!!
rdt_recv: Received a message of size 211
rdt_close: Received a corrupted packet: Type = DATA, Length = 211
rdt_close: Drop the packet
rdt_close: Received a retransmission DATA packet from peer!!
rdt_close: Retransmit the ACK packet
WARNING: udt_send: Packet lost in unreliable layer!!
rdt_close: Received a retransmission DATA packet from peer!!
rdt_close: Retransmit the ACK packet
rdt_close: Nothing happened for 0.500 second
rdt_close: Release the socket
Completed the file transfer.
Server program terminated
atctam@atctamws:~/Desktop/Dropbox/c3234/Project-2017/Part3$
```