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.

```
● ● ●                    Part3 — -zsh — 80×31
Last login: Wed Mar  3 16:41:24 on ttys002
[atctam@atctamnb 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: 0.004 s      Throughtput: 2245.30 KB/s
rdt_close: Nothing happened for 0.500 second
rdt_close: Release the socket
Client program terminated
atctam@atctamnb Part3 %
```

```
● ● ●                    Part3 — -zsh — 80×36
[atctam@atctamnb 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@atctamnb 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.

```
Part3 — -zsh — 80×47
Received server positive response
Start the file transfer . . .
WARNING: udt_send: Packet corrupted in unreliable layer!!
WARNING: udt_send: Packet lost in unreliable layer!!
WARNING: udt_send: Packet lost in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 2 again
WARNING: udt_send: Packet lost in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 3 again
rdt_send: Timeout!! Retransmit the packet 4 again
rdt_send: Timeout!! Retransmit the packet 5 again
rdt_send: Timeout!! Retransmit the packet 6 again
rdt_send: Received a retransmission DATA packet from peer!!
rdt_send: Retransmit the ACK packet
rdt_send: Timeout!! Retransmit the packet 2 again
rdt_send: Timeout!! Retransmit the packet 3 again
rdt_send: Timeout!! Retransmit the packet 4 again
rdt_send: Timeout!! Retransmit the packet 5 again
rdt_send: Timeout!! Retransmit the packet 6 again
rdt_send: Received a corrupted packet: Type = ACK, Length = 6
rdt_send: Drop the packet
rdt_send: Received the ACK with seqNo.: 3
rdt_send: All segments from 2 to 3 are acknowledged
rdt_send: Received the ACK with seqNo.: 5
rdt_send: All segments from 4 to 5 are acknowledged
rdt_send: Received a corrupted packet: Type = ACK, Length = 6
rdt_send: Drop the packet
rdt_send: Timeout!! Retransmit the packet 6 again
rdt_send: Received a corrupted packet: Type = ACK, Length = 6
rdt_send: Drop the packet
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 lost in unreliable layer!!
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: Timeout!! Retransmit the packet 10 again
rdt_send: Timeout!! Retransmit the packet 11 again
rdt_send: Received the ACK with seqNo.: 11
rdt_send: All segments from 10 to 11 are acknowledged
rdt_send: Sent 5 message(s) of total size 4205
Completed the file transfer.
Total elapse time: 0.292 s        Throughtput: 31.52 KB/s
rdt_close: Nothing happened for 0.500 second
rdt_close: Release the socket
Client program terminated
atctam@atctamnb Part3 %
```

```
Part3 — -zsh — 80×47
rdt_send: Peer sent me a new DATA packet!!
rdt_send: Drop the packet as I cannot accept it at this point
rdt_send: Peer sent me a new DATA packet!!
rdt_send: Drop the packet as I cannot accept it at this point
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
WARNING: udt_send: Packet corrupted in unreliable layer!!
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
WARNING: udt_send: Packet lost in unreliable layer!!
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 corrupted 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
WARNING: udt_send: Packet corrupted in unreliable layer!!
rdt_recv: Received a retransmission DATA packet –seqNo.: 6 (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: 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
WARNING: udt_send: Packet lost in unreliable layer!!
rdt_recv: Received a message of size 1006
rdt_recv: Received a retransmission DATA packet –seqNo.: 10 (expected: 11)
rdt_recv: Drop the packet
rdt_recv: Retransmit the ACK packet
WARNING: udt_send: Packet lost in unreliable layer!!
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@atctamnb 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.

```
●●●                    Part3 — -zsh — 80×47
rdt_send: Timeout!! Retransmit the packet 6 again
rdt_send: Received the ACK with seqNo.: 3
rdt_send: Timeout!! Retransmit the packet 4 again
WARNING: udt_send: Packet lost in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 5 again
rdt_send: Timeout!! Retransmit the packet 6 again
rdt_send: Timeout!! Retransmit the packet 4 again
rdt_send: Timeout!! Retransmit the packet 5 again
rdt_send: Timeout!! Retransmit the packet 6 again
rdt_send: Received the ACK with seqNo.: 4
rdt_send: Received a corrupted packet: Type = ACK, Length = 6
rdt_send: Drop the packet
rdt_send: Received a corrupted packet: Type = DATA, Length = 6
rdt_send: Drop the packet
WARNING: udt_send: Packet corrupted in unreliable layer!!
rdt_send: Timeout!! Retransmit the packet 5 again
rdt_send: Timeout!! Retransmit the packet 6 again
rdt_send: Received the ACK with seqNo.: 6
rdt_send: All segments from 5 to 6 are acknowledged
rdt_send: Sent 5 message(s) of total size 5000
WARNING: udt_send: Packet lost in unreliable layer!!
WARNING: udt_send: Packet lost in unreliable layer!!
rdt_send: Received a corrupted packet: Type = ACK, Length = 6
rdt_send: Drop the packet
rdt_send: Received a corrupted packet: Type = ACK, Length = 6
rdt_send: Drop the packet
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 7 again
WARNING: udt_send: Packet lost 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
rdt_send: Timeout!! Retransmit the packet 10 again
rdt_send: Timeout!! Retransmit the packet 11 again
rdt_send: Received a corrupted packet: Type = DATA, Length = 6
rdt_send: Drop the packet
rdt_send: Received the ACK with seqNo.: 11
rdt_send: All segments from 7 to 11 are acknowledged
rdt_send: Sent 5 message(s) of total size 4205
Completed the file transfer.
Total elapse time: 0.513 s        Throughtput: 17.96 KB/s
rdt_close: Nothing happened for 0.500 second
rdt_close: Release the socket
Client program terminated
atctam@atctamnb Part3 %
```

```
●●●                    Part3 — -zsh — 80×47
rdt_recv: Drop the packet
rdt_recv: Got an expected packet - seqNo.:  3
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: Got an expected packet - seqNo.:  4
WARNING: udt_send: Packet lost in unreliable layer!!
rdt_recv: Received a message of size 1006
rdt_recv: Received an out-of-order DATA packet -seqNo.: 6 (expected: 5)
rdt_recv: Drop the packet
rdt_recv: Retransmit the ACK packet
WARNING: udt_send: Packet lost in unreliable layer!!
rdt_recv: Received a retransmission DATA packet -seqNo.: 4 (expected: 5)
rdt_recv: Drop the packet
rdt_recv: Retransmit the ACK packet
rdt_recv: Got an expected packet - seqNo.:  5
WARNING: udt_send: Packet corrupted in unreliable layer!!
rdt_recv: Received a message of size 1006
rdt_recv: Got an expected packet - seqNo.:  6
WARNING: udt_send: Packet corrupted in unreliable layer!!
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 a retransmission DATA packet -seqNo.: 6 (expected: 7)
rdt_recv: Drop the packet
rdt_recv: Retransmit the ACK packet
rdt_recv: Got an expected packet - seqNo.:  7
WARNING: udt_send: Packet corrupted in unreliable layer!!
rdt_recv: Received a message of size 1006
rdt_recv: Got an expected packet - seqNo.:  8
WARNING: udt_send: Packet corrupted in unreliable layer!!
rdt_recv: Received a message of size 1006
rdt_recv: Got an expected packet - seqNo.:  9
WARNING: udt_send: Packet corrupted in unreliable layer!!
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: Got an expected packet - seqNo.:  10
WARNING: udt_send: Packet corrupted in unreliable layer!!
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@atctamnb Part3 %
```