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Course Section: 001

Lab #6-2

Total in points (100 points total): \_\_\_\_\_

Professor's Comments:

Affirmation of my Independent Effort: Eeshan Mundhe  
(Sign here)

There are three files namely tcp\_fsm.py which contains the main() function, fsm.py and test\_tcp\_fsm.py which contains the test cases.

```
1 The main() function is present in the tcp_fsm.py file
2
3 To run the files use the following commands,
4 python3 filename.py (should be in the folder directory)
5
6 To use commands inside the files,
7 Use -
8 PASSIVE
9 ACTIVE
10 SYN
11 ACK
12 SDATA
13 RDATA
14 FIN
15 CLOSE
16 TIMEOUT
```

PROBLEMS   OUTPUT   TERMINAL   DEBUG CONSOLE

PS C:\Users\Eeshan\Desktop\EESHAN\_DCN\_lab\_6-2> █

1. Running the tcp\_fsm.py file to read all the states and show the state transitions.

```
PASSIVE
Event PASSIVE received, current State is LISTEN
SYN
Event SYN received, current State is SYN_RCVD
ACK
Event ACK received, current State is ESTABLISHED
SDATA
DATA sent 1
SDATA
DATA sent 2
RDATA
DATA received 1
RATA
Error: unexpected Event: RATA
RDATA
DATA received 2
FIN
Event FIN received, current State is CLOSE_WAIT
CLOSE
Event CLOSE received, current State is LAST_ACK
SYN
FSMException: Cannot transition from this state "LAST_ACK" on event "SYN"
ACK
Event ACK received, current State is CLOSED
```

```

ACTIVE
Event ACTIVE received, current State is SYN_SENT
SYN
Event SYN received, current State is SYN_RCVD
RDATA
FSMException: Cannot transition from this state "SYN_RCVD" on event "RDATA"
ACK
Event ACK received, current State is ESTABLISHED
RDATA
DATA received 1
RDATA
DATA received 2
RDATA
DATA received 3
SDATA
DATA sent 1
SDATA
DATA sent 2
SDATA
DATA sent 3
ACK
FSMException: Cannot transition from this state "ESTABLISHED" on event "ACK"
CLOSE
Event CLOSE received, current State is FIN_WAIT_1
FIN
Event FIN received, current State is CLOSING
ACK
Event ACK received, current State is TIME_WAIT
TIMEOUT
Event TIMEOUT received, current State is CLOSED

```

2. Here, we can see that SDATA sends an event to the FSM and RDATA shows data received.

```

SDATA
DATA sent 1
SDATA
DATA sent 2
RDATA
DATA received 1
RATA
Error: unexpected Event: RATA
RDATA
DATA received 2

```

3. Any unexpected event when typed in yields an output 'Unexpected Event: Event Name' as shown.

```

RATA
Error: unexpected Event: RATA

```

4. A FsmException is raised whenever an Event is given that is not specified for a current state.

```

SDATA
DATA sent 3
ACK
FSMException: Cannot transition from this state "ESTABLISHED" on event "ACK"
CLOSE
Event CLOSE received, current State is FIN_WAIT_1
FIN
Event FIN received, current State is CLOSING
ACK
Event ACK received, current State is TIME_WAIT
TIMEOUT
Event TIMEOUT received, current State is CLOSED

```

5. After you execute a command, just press Enter to exit.

```

ACTIVE
Event ACTIVE received, current State is SYN_SENT
SYN
Event SYN received, current State is SYN_RCVD
RDATA
FSMException: Cannot transition from this state "SYN_RCVD" on event "RDATA"
ACK
Event ACK received, current State is ESTABLISHED
RDATA
DATA received 1
RDATA
DATA received 2
RDATA
DATA received 3
SDATA
DATA sent 1
SDATA
DATA sent 2
SDATA
DATA sent 3
ACK
FSMException: Cannot transition from this state "ESTABLISHED" on event "ACK"
CLOSE
Event CLOSE received, current State is FIN_WAIT_1
FIN
Event FIN received, current State is CLOSING
ACK
Event ACK received, current State is TIME_WAIT
TIMEOUT
Event TIMEOUT received, current State is CLOSED

```

6. Test cases also run via the test\_tcp\_fsm.py file.

```
language: x86_64-linux-gnu
collected 25 items

test_tcp_fsm.py::test_tcp_fsm[transitions0-CLOSE_WAIT] PASSED [ 40%]
test_tcp_fsm.py::test_tcp_fsm[transitions1-ESTABLISHED] PASSED [ 80%]
test_tcp_fsm.py::test_tcp_fsm[transitions2-LISTEN] PASSED [ 120%]
test_tcp_fsm.py::test_tcp_fsm[transitions3-SYN_SENT] PASSED [ 160%]
test_tcp_fsm.py::test_tcp_fsm[transitions4-SYN_RECV] PASSED [ 200%]
test_tcp_fsm.py::test_tcp_fsm[transitions5-FIN_WAIT_1] PASSED [ 240%]
test_tcp_fsm.py::test_tcp_fsm[transitions6-ESTABLISHED] PASSED [ 280%]
test_tcp_fsm.py::test_tcp_fsm[transitions7-SYN_RECV] PASSED [ 320%]
test_tcp_fsm.py::test_tcp_fsm[transitions8-LISTEN] PASSED [ 360%]
test_tcp_fsm.py::test_tcp_fsm[transitions9-CLOSED] PASSED [ 400%]
test_tcp_fsm.py::test_tcp_fsm[transitions10-TIME_WAIT] PASSED [ 440%]
test_tcp_fsm.py::test_tcp_fsm[transitions11-CLOSED] PASSED [ 480%]
test_tcp_fsm.py::test_tcp_fsm[transitions12-SYN_RECV] PASSED [ 520%]
test_tcp_fsm.py::test_tcp_fsm[transitions13-FIN_WAIT_2] PASSED [ 560%]
test_tcp_fsm.py::test_tcp_fsm[transitions14-CLOSE_WAIT] PASSED [ 600%]
test_tcp_fsm.py::test_tcp_fsm[transitions15-LAST_ACK] PASSED [ 640%]
test_tcp_fsm.py::test_tcp_fsm[transitions16-SYN_SENT] PASSED [ 680%]
test_tcp_fsm.py::test_tcp_fsm[transitions17-CLOSED] PASSED [ 720%]
test_tcp_fsm.py::test_tcp_fsm[transitions18-FIN_WAIT_1] PASSED [ 760%]
test_tcp_fsm.py::test_tcp_fsm[transitions19-SYN_RECV] PASSED [ 800%]
test_tcp_fsm.py::test_tcp_fsm[transitions20-TIME_WAIT] PASSED [ 840%]
test_tcp_fsm.py::test_tcp_fsm[transitions21-SYN_RECV] PASSED [ 880%]
test_tcp_fsm.py::test_tcp_fsm[transitions22-SYN_RECV] PASSED [ 920%]
test_tcp_fsm.py::test_tcp_fsm[transitions23-FIN_WAIT_1] PASSED [ 960%]
test_tcp_fsm.py::test_tcp_fsm[transitions24-CLOSING] PASSED [1000%]

25 passed in 0.01s
```