

# Assignment 2

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## PART II

### Stream Reassembler test case results.

```
shubham21099@DESKTOP-IP0PV11:~/CN/assignment2/build$ ctest -R '^fsm_stream_reassembler'
Test project /home/shubham21099/CN/assignment2/build
  Start 16: fsm_stream_reassembler_cap
1/8 Test #16: fsm_stream_reassembler_cap ..... Passed    0.13 sec
  Start 17: fsm_stream_reassembler_single
2/8 Test #17: fsm_stream_reassembler_single ..... Passed    0.00 sec
  Start 18: fsm_stream_reassembler_seq
3/8 Test #18: fsm_stream_reassembler_seq ..... Passed    0.00 sec
  Start 19: fsm_stream_reassembler_dup
4/8 Test #19: fsm_stream_reassembler_dup ..... Passed    0.01 sec
  Start 20: fsm_stream_reassembler_holes
5/8 Test #20: fsm_stream_reassembler_holes ..... Passed    0.00 sec
  Start 21: fsm_stream_reassembler_many
6/8 Test #21: fsm_stream_reassembler_many ..... Passed    9.89 sec
  Start 22: fsm_stream_reassembler_overlapping
7/8 Test #22: fsm_stream_reassembler_overlapping ... Passed    0.00 sec
  Start 23: fsm_stream_reassembler_win
8/8 Test #23: fsm_stream_reassembler_win ..... Passed   11.85 sec

100% tests passed, 0 tests failed out of 8

Total Test time (real) = 21.89 sec
```

## PART III

### Wrapping Integers test case results.

```
shubham21099@DESKTOP-IP0PV11:~/CN/assignment2/build$ ctest -R '^wrapping_integers'
Test project /home/shubham21099/CN/assignment2/build
  Start 1: wrapping_integers_cmp
1/4 Test #1: wrapping_integers_cmp ..... Passed    0.01 sec
  Start 2: wrapping_integers_unwrap
2/4 Test #2: wrapping_integers_unwrap ..... Passed    0.01 sec
  Start 3: wrapping_integers_wrap
3/4 Test #3: wrapping_integers_wrap ..... Passed    0.01 sec
  Start 4: wrapping_integers_roundtrip
4/4 Test #4: wrapping_integers_roundtrip ..... Passed    3.84 sec

100% tests passed, 0 tests failed out of 4

Total Test time (real) = 3.91 sec
```

## TCP Receiver test case results.

```
shubham21099@DESKTOP-IP0PV11:~/CN/assignment2/build$ ctest -R '^recv'
Test project /home/shubham21099/CN/assignment2/build
Test project /home/shubham21099/CN/assignment2/build
  Start 10: recv_connect
1/6 Test #10: recv_connect ..... Passed    0.01 sec
  Start 11: recv_transmit
2/6 Test #11: recv_transmit ..... Passed    0.76 sec
  Start 12: recv_window
3/6 Test #12: recv_window ..... Passed    0.01 sec
  Start 13: recv_reorder
4/6 Test #13: recv_reorder ..... Passed    0.01 sec
  Start 14: recv_close
5/6 Test #14: recv_close ..... Passed    0.01 sec
  Start 15: recv_special
6/6 Test #15: recv_special ..... Passed    0.01 sec

100% tests passed, 0 tests failed out of 6

Total Test time (real) =  0.83 sec
```

## Unique Implementations:-

- I used `map<size_t, pair<char, bool>>` to represent the reassembler's buffer; it will store a pair of index, data, eof.
- To Calculate the unassembled bytes, I just returned the size of my buffer because my buffer stores the characters of unassembled data. It is better than carrying and updating a separate variable to keep track of unassembled bytes.

## All Test cases

```

shubham21099@DESKTOP-IP0PV11:~/CN/assignment2/build$ ctest
Test project /home/shubham21099/CN/assignment2/build
    Start 1: wrapping_integers_cmp
1/23 Test #1: wrapping_integers_cmp ..... Passed    0.00 sec
    Start 2: wrapping_integers_unwrap
2/23 Test #2: wrapping_integers_unwrap ..... Passed    0.00 sec
    Start 3: wrapping_integers_wrap
3/23 Test #3: wrapping_integers_wrap ..... Passed    0.00 sec
    Start 4: wrapping_integers_roundtrip
4/23 Test #4: wrapping_integers_roundtrip ..... Passed    0.56 sec
    Start 5: byte_stream_construction
5/23 Test #5: byte_stream_construction ..... Passed    0.00 sec
    Start 6: byte_stream_one_write
6/23 Test #6: byte_stream_one_write ..... Passed    0.00 sec
    Start 7: byte_stream_two_writes
7/23 Test #7: byte_stream_two_writes ..... Passed    0.00 sec
    Start 8: byte_stream_capacity
8/23 Test #8: byte_stream_capacity ..... Passed    1.13 sec
    Start 9: byte_stream_many_writes
9/23 Test #9: byte_stream_many_writes ..... Passed    0.00 sec
    Start 10: recv_connect
10/23 Test #10: recv_connect ..... Passed    0.00 sec
    Start 11: recv_transmit
11/23 Test #11: recv_transmit ..... Passed    0.12 sec
    Start 12: recv_window
12/23 Test #12: recv_window ..... Passed    0.00 sec
    Start 13: recv_reorder
13/23 Test #13: recv_reorder ..... Passed    0.00 sec
    Start 14: recv_close
14/23 Test #14: recv_close ..... Passed    0.00 sec
    Start 15: recv_special
15/23 Test #15: recv_special ..... Passed    0.00 sec
    Start 16: fsm_stream_reassembler_cap
16/23 Test #16: fsm_stream_reassembler_cap ..... Passed    0.18 sec
    Start 17: fsm_stream_reassembler_single
17/23 Test #17: fsm_stream_reassembler_single ..... Passed    0.00 sec
    Start 18: fsm_stream_reassembler_seq
18/23 Test #18: fsm_stream_reassembler_seq ..... Passed    0.00 sec
    Start 19: fsm_stream_reassembler_dup
19/23 Test #19: fsm_stream_reassembler_dup ..... Passed    0.01 sec
    Start 20: fsm_stream_reassembler_holes
20/23 Test #20: fsm_stream_reassembler_holes ..... Passed    0.00 sec
    Start 21: fsm_stream_reassembler_many
21/23 Test #21: fsm_stream_reassembler_many ..... Passed   11.41 sec
    Start 22: fsm_stream_reassembler_overlapping
22/23 Test #22: fsm_stream_reassembler_overlapping ... Passed    0.00 sec
    Start 23: fsm_stream_reassembler_win
23/23 Test #23: fsm_stream_reassembler_win ..... Passed   11.85 sec

100% tests passed, 0 tests failed out of 23

Total Test time (real) = 25.32 sec

```