**CMPEN/EE 362 HW 3 Rubric**

**Total number of points:** 15

**Problem 1: (2 points)**

1. (1 point)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Source IP | Destination IP | source port# | destination port# |
| P1P2 | A | S | a | s |
| P3P2 | B | S | b1 | s |
| P4P2 | B | S | b2 | s |
| P2P4 | S | B | s | b2 |

* -0.0 points if all rows of the table are correct.
* -0.25 points if 1st row of the table is incorrect.
* -0.25 points if 2nd row of the table is incorrect.
* -0.25 points if 3rd row of the table is incorrect.
* -0.25 points if 4th row of the table is incorrect.
* -1.0 point if totally wrong or no attempt was made.

1. Yes, a and b1 could be the same. (0.25 points)

* -0.0 points if correct.
* -0.25 points if incorrect or no attempt was made.

1. No, b2 and b1 cannot be the same. (0.25 points)

* Same as (b).

1. Server needs to create 3 TCP sockets, one for each client process. (0.5 points)

* -0.0 points if correct.
* -0.25 points if incorrect number of sockets mentioned.
* -0.25 points if mentioned incorrect socket type.

**Problem 2: (2.5 points)**

1. The checksum is: 1000 1110 0001 0000 (1.75 points)

* -0.0 points if correct and proper steps are shown (including wrapping around the overflow bit).
* -0.5 points if incorrect but proper steps are shown.
* -1.0 points if correct but steps are not properly shown.
* -1.75 points if incorrect and no steps are shown, or no attempt was made.

1. No. As long as there is a 1-bit error, it’ll be detected. (0.25 points)

* -0.0 points if correct.
* -0.25 points if incorrect.

1. Yes, a 2-bit error could be undetected. (0.5 points)

* -0.0 points if correct and an example is shown.
* -0.25 points if correct but no example is shown.
* -0.5 points if incorrect.

**Problem 3: (1 point)**

This situation will result in a deadlock.

* -0.0 points if correct and a proper explanation is given.
* -0.5 points if correct but no explanation.
* -1.0 points if incorrect or no attempt was made.

**Problem 4: (1 point)**

* + -0.0 points if fully correct.
  + -0.25 points if mostly correct (made a small error).
  + -0.5 points if partially correct (the event-action lists for some of the edges are incorrect).
  + -0.75 points if an incorrect attempt was made.
  + -1.0 point if no attempt was made.

**Problem 5: (1 point)**

* + Same as 4.

**Problem 6: (2 points)**

1. (0.5 points)

In-order and successful:

Sequence number: 201, 301, 361;

ACK number: 301, 361, 481.

* + -0.0 points if fully correct.
  + -0.1 points if mostly correct (made a small error).
  + -0.25 points if sequence numbers are incorrect.
  + -0.25 points if ACK numbers are incorrect.

1. (0.5 points)

The first segment sent by A is lost:

Sequence number: 201, 301, 361, 201;

ACK number: 201, 201, 481.

* + Same as (a).

1. (0.5 points)

The first acknowledgement sent by B is lost:

Sequence number: 201, 301, 361, 201;

ACK number: 361, 481, 481.

* + Same as (a).

1. (0.5 points)

The second segment sent by A arrives after the third segment:

Sequence number: 201, 301, 361;

ACK number: 301, 301, 481.

* + Same as (a).

**Problem 7: (3 points)**

1. SampleRTT (ms) = 70, 110, 102, 90, 115

EstimatedRTT (ms) = 78.8, 82.5, 84.9, 85.5, 89 (1 point)

* + -0.0 points if fully correct.
  + -0.25 points if mostly correct (up to 2 miscalculated values).
  + -0.5 points if correct approach but wrong values (more than 2).
  + -1.0 points if fully incorrect or no attempt was made.

1. If EstimatedRTT is updated first (upon receiving each SampleRTT),

SampleRTT (ms) = 70, 110, 102, 90, 115

DevRTT (ms) = 17.4, 19.7, 19.1, 15.8, 18.1 (1 point)

If DevRTT is updated first,

SampleRTT (ms) = 70, 110, 102, 90, 115

DevRTT (ms) = 17.7, 20.8, 20.5, 17.0, 19.8 (1 point)

* + Same as (a).

1. If EstimatedRTT is updated first,

SampleRTT (ms) = 70, 110, 102, 90, 115

TimeoutInterval (ms) = 148.5, 161.5, 161.4, 148.6, 161.5 (1 point)

If DevRTT is updated first,

SampleRTT (ms) = 70, 110, 102, 90, 115

TimeoutInterval (ms) = 149.6, 165.8, 166.9, 153.3, 168.4 (1 point)

* + Same as (a).

**Problem 8: (2.5 points)**

1. GBN: 12 segments, 11 ACKs.

SR: 7 segments, 6 ACKs.

TCP: 7 segments ,6 ACKs (1 point)

* + -0.0 points if fully correct.
  + -0.25 points if mostly correct (wrong answer for one protocol).
  + -0.5 points if mostly incorrect (wrong answer for two protocols).
  + -1.0 points fully incorrect or no attempt is made.

1. GBN: sequence number (1,2,3,4,5,6,1,2,3,4,5,6), ACK number (0,0,0,0,0,1,2,3,4,5,6)

SR: sequence number (1,2,3,4,5,6,1), ACK number (2,3,4,5,6,1)

TCP: sequence number (1,2,3,4,5,6,1), ACK number (1,1,1,1,1,7) (1 point)

* + Same as (a).

1. TCP. This is because TCP uses fast retransmit without waiting until time out. (0.5 points)
   * -0.0 points correct answer and explanation is given (mentions fast retransmission).
   * -0.25 points if correct but no explanation (doesn’t mention fast retransmission).
   * -0.5 points if incorrect or no attempt was made.