Put your name on the back in the upper right-hand corner and fold your quiz lengthwise - Thanks.

CS 440
Quiz 12

1. **Why does TCP need a *PUSH* flag?**

   Because TCP sends segments at its pleasure. If an application needs something to be sent immediately, or to define its own message boundaries, it needs to tell TCP to send using PUSH.

2. **Why does TCP use the three–way handshake – be specific?**

   To ensure that the sequence numbers and advertised window sizes for the two sides are properly synchronized.

3. **What does TCP do to avoid the Silly Window Problem?**

   The receiver doesn't advertise window sizes less than 1 MSS (Maximum Segment Size).

4. **A TCP connection is using smoothing with $\alpha = 0.7$, Karn-Partridge and Jacobsen-Karels. The current ERTT is 200 ms.**

   (a) **What is the next timeout value if the SRTT is 100 ms?**

   ERTT = 0.7 * 200 + 0.3 * 100 = 170
   timeout = 2 * 170 = 340

   (b) **What is the next timeout value if current packet timesout and has to be duplicated twice?**

   For each timeout double the ERTT to 340 (or 400) and then to 680 (or 800). Then double again to get the timeout of 1360 (or 1600).