For these problems the Jacobson/Karels Algorithm uses delta = 1/8, μ = 1.0 and Φ = 4.0.

1) (10 pts) Modified Chapter 5 Text Book Problem 26. Use matlab, excel (works great) or a program to perform the analysis on this problem. The initial iteration information is shown below.
a) Perform two separate calculations one using a starting deviation value of 0.5 and one using 1.5. How sensitive is the algorithm to these choices of deviation?
b) Perform a third calculation using a starting deviation of 0.5 and a delta of 1/4. How do the results for these parameters compare to results from using a deviation of 0.5 and a delta of 1/8.

Iteration #	Sample RTT	Estimated RTT	Deviation*	Difference	Timeout
0 – start point	1.0000	4.0000	0.5000	-	-
1	1.0000	3.6250	0.8125	-3.0000	6.8750

*Starting Deviation will be 0.5 or 1.5 to start each of the three calculations. Iteration #1 shows result for when the starting deviation value is 0.5. It will be different for a deviation of 1.5

In the formulas for the Jacobson/Karels algorithm, you need to figure out which numbers are used from the previous iteration and which ones are used from the current iteration to come up with the calculated values for the current iteration. **You are looking to run the calculations until the Timeout time drops below 4 seconds. Show your numbers with 4 decimal places**

2) (10 pts) Modified Chapter 5 Text Book Problem 28. Excel works well for this problem since you will need to modify the Sample RTT at various points when the calculated timeout drops below 4.0. **Run the simulation initially using 1.0 for all of the sample RTTs**. Then for the entries where the timeout drops below 4.0, change the sample RTT for that run to 4.0. You are trying to find out how many sample RTTs arrive before a 4.0 sample time is needed to keep the timeout time above 4.0.

Run the simulation for this problem with 35 iterations and make note of how many iterations it takes before the sample RTT is bumped from 1.0 to 4.0. Your table should have several Sample RTT of 1.0 followed by one of 4.0 followed by several more of 1.0, etc. **For the provided start data**, the first calculation drops the timeout time below 4.0, so change the sample RTT to 4.0 and recalculate and obtain the values shown.

Iteration #	Sample RTT	Estimated RTT	Deviation*	Difference	Timeout
0 – start point	1.0000	1.25	0.7500	-0.25	4.25
1	4.0000	1.5938	1.0000	2.75	5.5938

3) (5 pts) Use the Estimated RTT and timeout formulas on page 418 to determine the TCP timeout value (These are the original timeout algorithm formulas). *Perform the analysis for 30 sample RTTs using five sample RTTs of 1.000 followed by one RTT of 5.000 (then repeat this pattern, so RTT is 5.0 for iteration 6, 12, 18, 24, etc). The starting (current) estimated RTT is 1.50*
a) Perform the analysis using α = 0.8
b) Perform the analysis using α = 0.9

The following problems are extra problems that you should consider working.
Chapter 5 Text Book Problem 10, 13 and 27