Networks Assignment 3-TCP Control Protocol

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Algorithm

We pass various parameters to the simulation function i.e. initial congestion window size,exponential and linear growth rate,time out multiplier,probability of acknowledgment.I have used 2000 as the total number of segments to be passed.We plot different sizes of congestion windows against number of segments passed.

Parameters used

(a) Ki: Initial Congestion Window Size (1 or 4)
(b) Km: Multiplier, during the exponential growth phase (1 or 1.15)
(c) Kn: Multiplier, during the linear growth phase (0.5 or 1.0)
(d) Kf: Multiplier, during timeout (0.1 or 0.3)
(e) Ps: Probability of successful ACK packet received:(0.99 or 0.9999)

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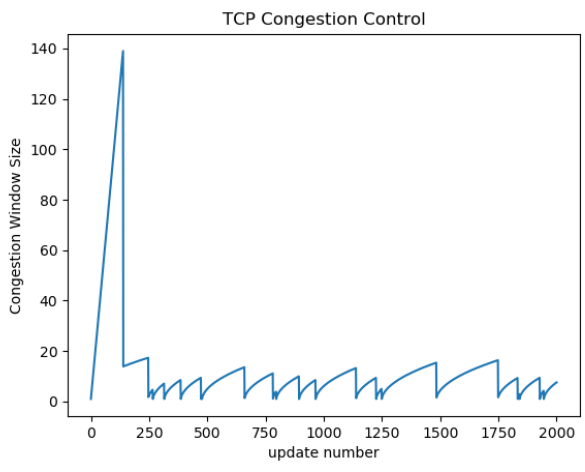
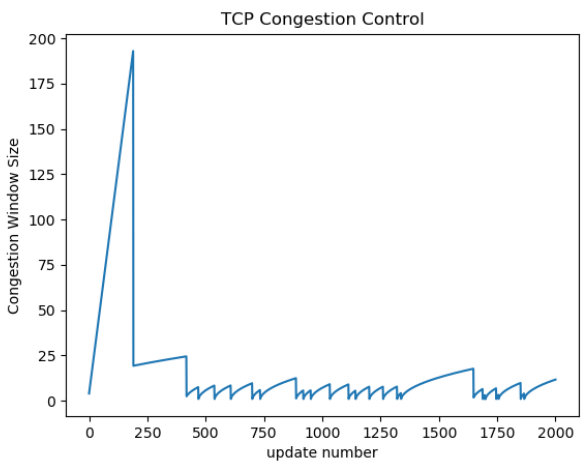
a)Ki

	
Ki=1 Km=1 Kn=0.5 Kf =0.1 Ps=0.99	Ki=4 Km=1 Kn=0.5 Kf =0.1 Ps=0.99

The left plot starts with contention window size 1 and right side with contention window size 4 and all other parameters are kept same.We can see the plots are quite similar as growth during the exponential phase is independent of the initial window size. As we have used random timeouts we can see the variance in the size of linear subplots.

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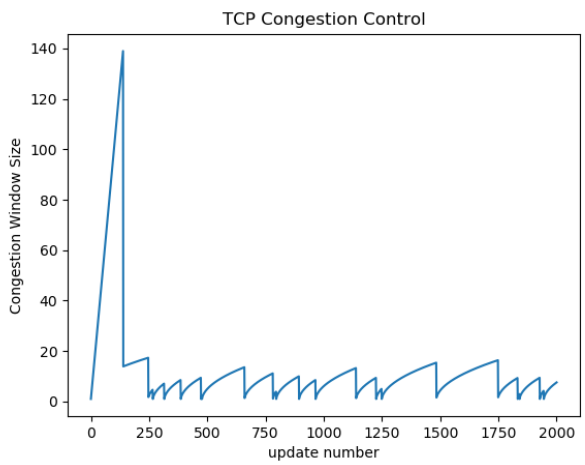
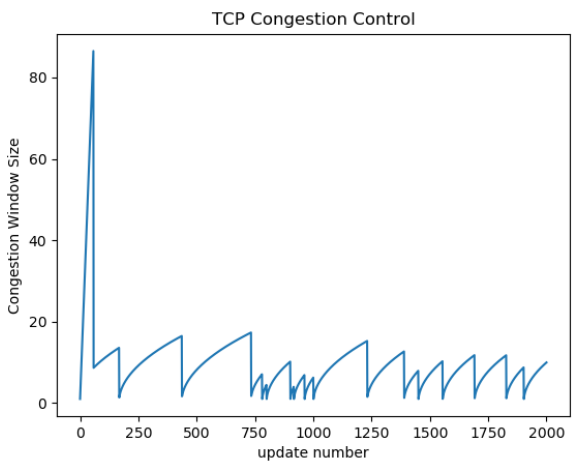
b)Km

	
Ki=1 Km=1 Kn=0.5 Kf =0.1 Ps=0.99	Ki=1 Km=1.5 Kn=0.5 Kf =0.1 Ps=0.99

Km impacts the slope during the exponential growth phase.The slope is much steeper in right graph as compared to left with lower value of Km.Also we can see lower Km leads to many peaks between segments 250 to 500.On other hand in right graph there is only one peak between 250 to 500.

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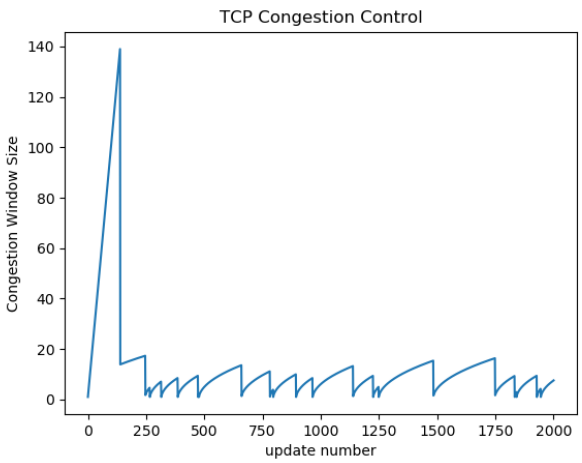
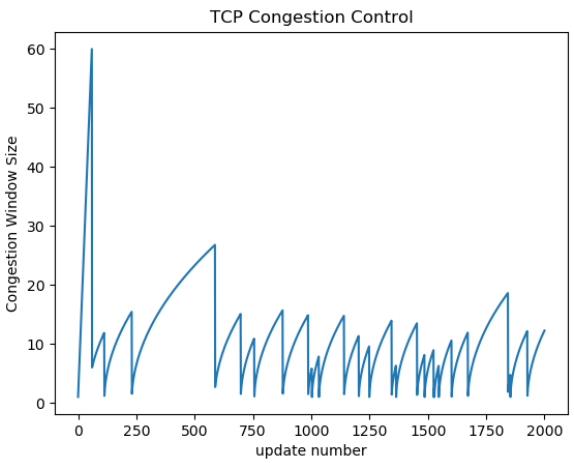
c)Kn

	
Ki=1 Km=1 Kn=0.5 Kf =0.1 Ps=0.99	Ki=1 Km=1 Kn=1.0 Kf =0.1 Ps=0.99

Kn impacts the slope during the linear growth phase.As the slope is higher in the second plot CW grows more rapidly and thus we can see a larger number of peaks in the right graph compared to left. Also, we can see a very high CW value in the left plot which makes the slopes even lesser compared to the right plot which has a lower value of initial CW i.e. 60.

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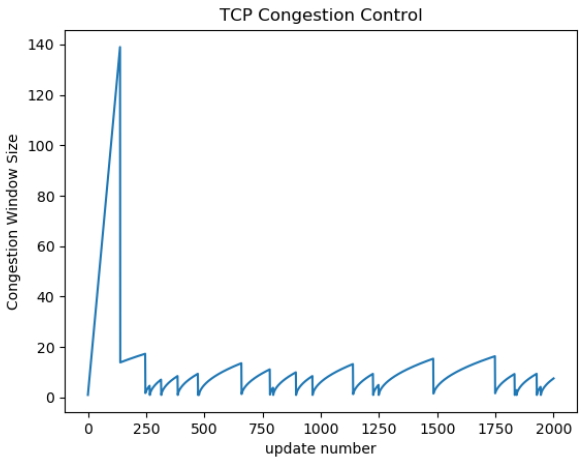
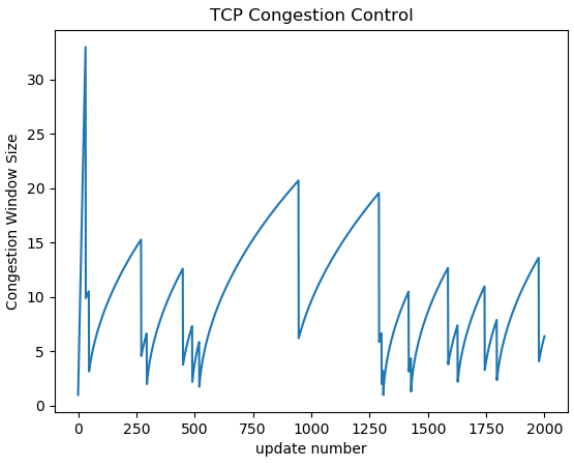
d)Kf

	
Ki=1 Km=1 Kn=0.5 Kf =0.1 Ps=0.99	Ki=1 Km=1.5 Kn=0.5 Kf =0.3 Ps=0.99

As we are using a random timeout mechanism the graphs may not be very uniform.But we can cleary see that after the first peak as we use larger values of Kf to upgrade the CW we can see larger values of CW in upcoming peaks in right plot as compared to the left.

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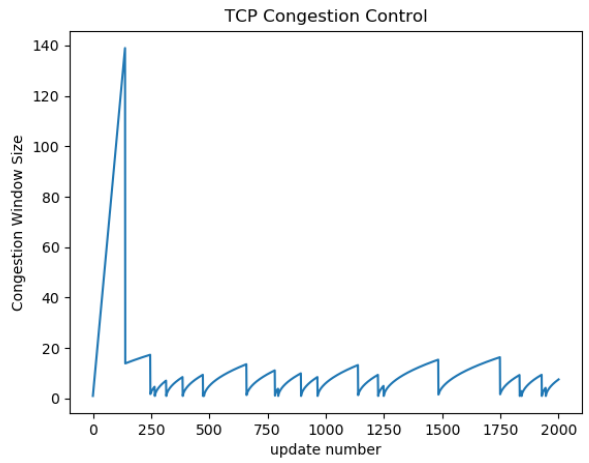
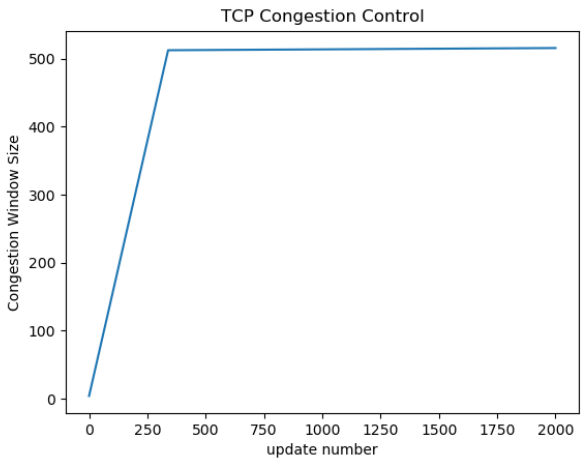
e)Ps

	
Ki=1 Km=1 Kn=0.5 Kf =0.1 Ps=0.99	Ki=1 Km=1.5 Kn=0.5 Kf =0.1 Ps=0.9999

Since the probability of acknowledgment is very high we can rarely see timeouts in the right plot and thus there is constant growth till threshold value is reached.