Homework 1 STAT5376
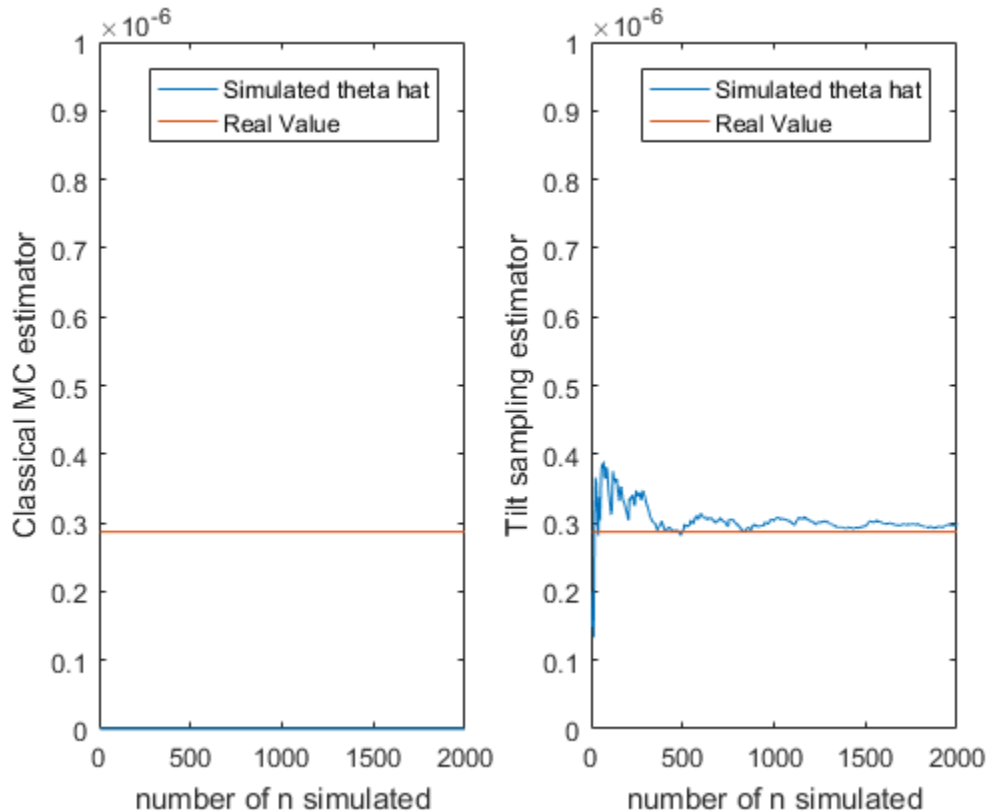
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1.Use the technique of classical MC and importance sampling via tilted densities to estimate the quantity $\theta = Pr(X > 5)$ where X is standard normal random variable. Generate estimates and plot convergence of both methods.

The result is as followed:

As you can see, classical MC failed even the n is 2000. This is because the probability of getting some random number bigger than 5 from standard normal distribution is very very unlikely. However, the tilted sampling works very fine and converge quickly after n is 500. So this proves the concept that the tilted sampling is better in estimating rare event.

All code please see 'https://github.com/rikku1983/STAT5376/blob/master/hw1.m'

Thanks!