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Stochastics CA 6 Redo







Code:

%StochCA6

K=[10, 10e3, 10e6];

for q=3:3

 %Declare Variables

 f=linspace(1,10);

 N=linspace(1, K(q),10e3);

 v=linspace(1, K(q),10e3);

 MSE=linspace(1, 100,100);

 VarErr=linspace(1, K(q),10e3);

 MeanErr=linspace(1, K(q),10e3);

 G=linspace(1,100,100);

 x= rand(K(q),1);

 Mean=mean(x);

 Variance= var(x);

 for i=1:length(x)

 curMean= (1/i)\*sum(x);

 x=x-0.5;

 x=x.^2;

 curVar=(1/i)\*sum(x);

 MeanErr(i)=curMean-Mean;

 VarErr(i)=curVar-Variance;

 end

 %Plot

 figure(1)

 semilogx(N,VarErr);

 title('Variance Error');

 xlabel('Sample Size');

 ylabel('Magnitude of Error');

 figure(2)

 semilogx(N,MeanErr);

 title('Mean Error');

 xlabel('Sample Size');

 ylabel('Magnitude of Error');

 %2

 figure(3)

 histogram(x, 100, 'Normalization', 'pdf');

 str1=sprintf('PDF of x[N] when N= %.0f', K(q));

 title(str1);

 [N,edge]=histcounts(x,100);

 for i=1:length(N)

 g=N-0.01;

 g=g.^2;

 MSE(i)=(1/i)\*sum(g);

 end

 p=(1:100);

 figure(4)

 semilogx(p, MSE);

 str2=sprintf('Mean Square Error when N= %.0f', K(q));

 title(str2);

 xlabel('Sample Size');

 ylabel('MSE');

 end