

In ques5a.m I have considered the uniform distribution and in ques5b.m , I have considered the gaussian distribution with mean = 0 and variance = 1

To generate random numbers from uniform distribution , I considered the rand function and to generate the random numbers from gaussian distribution , I considered the randn function.

$N1 = \text{rand}(100,5)$ means to consider 5 values from the uniform distribution repeated 100 times .

Similarly I have considered $N2, N3, \dots$ to consider different no of values as given in question

I created a 100×10 mean_value matrix to stored the mean for each repetition

$\text{mean_value}(:,1) = \text{mean}(N1,2);$

means to calculate the mean over each of the 100 rows of $N1$ and to store them in the 1st column of mean_value matrix

And then i used boxplot to plot the data

2nd part is same just I used $\text{randn}(\cdot)$ instead of $\text{rand}(\cdot)$ to generate data from Gaussian distribution instead of the Uniform distribution

In 1st part actual mean should be 0.5 and in 2nd part actual mean should be 0

So in part 1 , error = |calculated mean - 0.5|

And in part 2 , error = |calculated mean - 0.0|

boxplot_5a.png stores the plot for 1st part with uniform distribution

boxplot_5b.png stores the plot for 2nd part with gaussian distribution

Interpretation of box and whisker plot

The bottom boundary of each rectangle shows the minimum error in each set of 100 repetitions

The upper boundary of each rectangle shows the maximum error in each set of 100 repetitions

And the red line in each rectangle shows the median value in each set of 100 repetitions

The red plus signs are the data which are the outliers.

We can clearly see that as the no of data points increases, the median value of error decreases as well as the spread of absolute error also decreases i.e there is less difference in max value of error and min value of error which shows the error minimizes as the data keeps on increasing