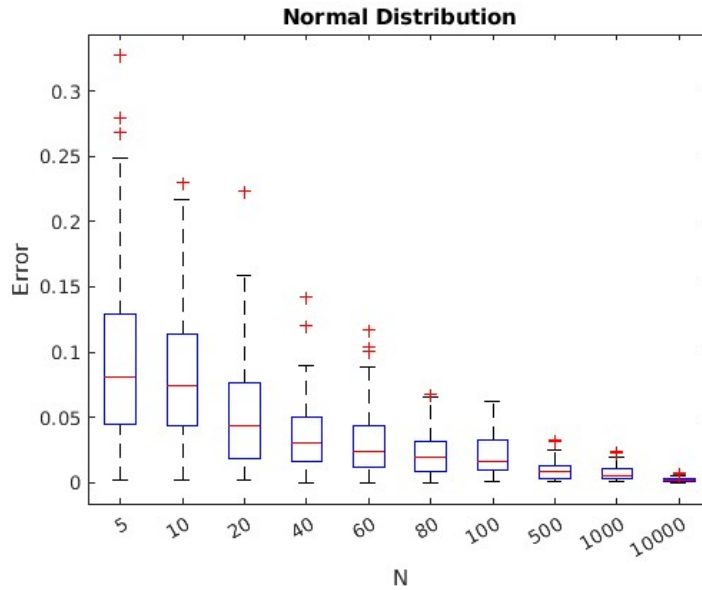


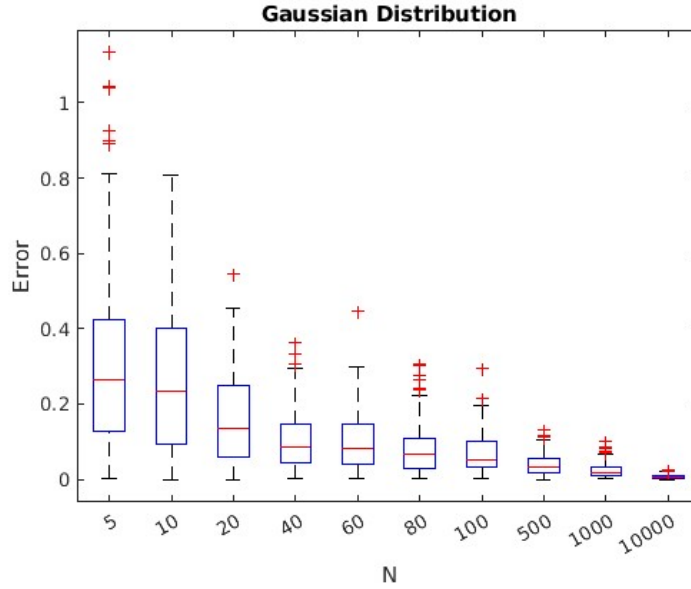
# Question 5 - Report

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Above box and whisker plot shows distribution of error with varying  $N$  in an uniform distribution. We have use `rand(.)` function in matlab to generate uniform random numbers from 0 to 1.



Above box and whisker plot shows distribution of error with varying  $N$  in an gaussian distribution. We have use `normrnd(.)` function in matlab to generate gaussian random numbers.

#### Idea::

We had to conduct 100 experiments for each  $N$  in both parts. In the first part we used `rand(.)` function in matlab to provide uniform random numbers from 0 to 1. In the second part we used `normrnd(.)` function in matlab to get gaussian random variables. Errors of each experiment were stored in a 2-D array, column-wise for each  $N$ . Then we plotted these errors in a box plot using `boxplot(.)` function in matlab.

#### Conclusion::

We can observe that as  $N$  increases, height of each box decreases and also the position of boxes shift towards 0. This denotes that as number of samples  $N$  increase, the average error of experiments lies more and more near zero. Also outliers become far and few. These plots also show Law of Large Numbers beautifully, as number of trials tend to infinity, their mean tends to the true mean.