

1. Use the Box-Muller method and Marsaglia and Bray method to do the following:
 - (a) Generate a sample of 100 and 10000 values from $N(0, 1)$. Hence, find the sample mean and variance.
 - (b) Now plot histogram (please see <https://plotly.com/python/2D-Histogram/>) of generated random numbers for both the cases, namely, 100 and 10000 samples.
 - (c) Now use the above generated values to generate samples from $N(0, 5)$ and $N(5, 5)$. Hence plot the density function from the formula and also plot histogram of generated sample in the same plot in both the cases. How do these two plots compare in both the cases?
 2. Keep a track of the computational time required for both the methods. Which method is faster?
 3. For the Marsaglia and Bray method keep track of the proportion of values rejected. How does it compare with $1 - \frac{\pi}{4}$?
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Submission Deadline: August 27, 2022, 11:50 AM