Lab-4 Report

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1)
(a)

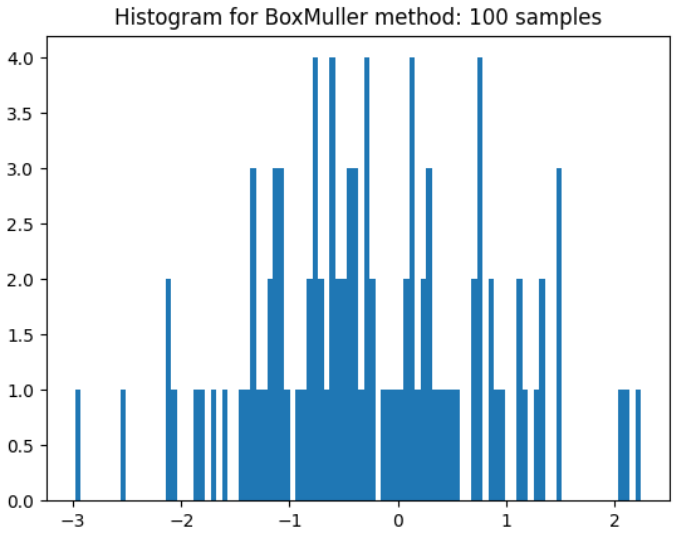
Box Muller:

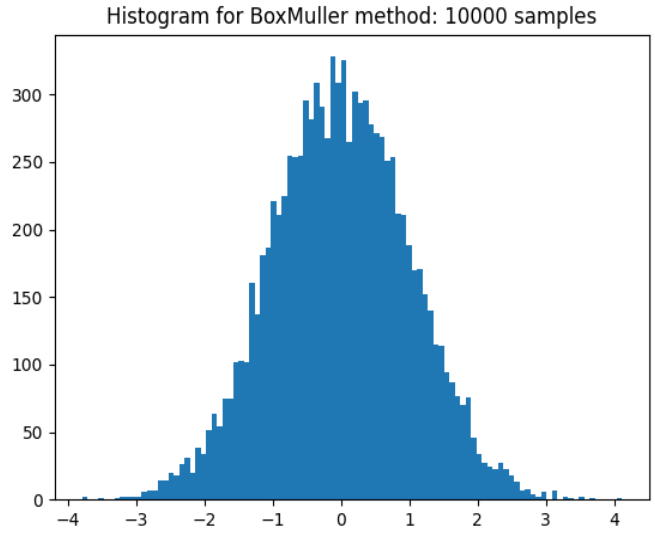
Samples	Mean	Variance
100	-0.2501	1.0638
10000	-0.0028	1.0178

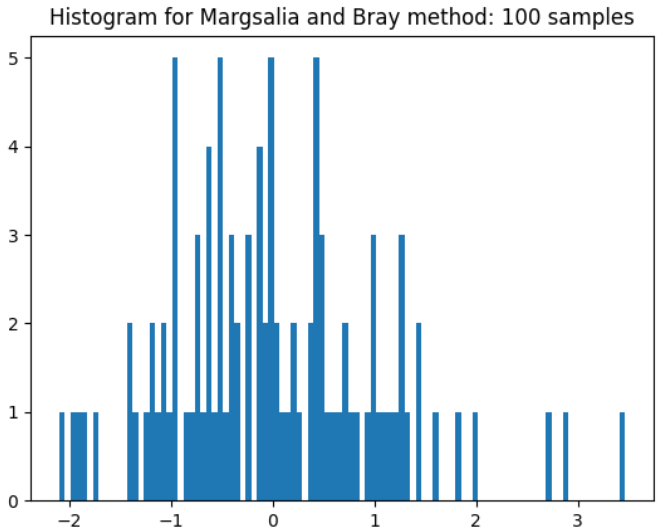
Margsalia and Bray:

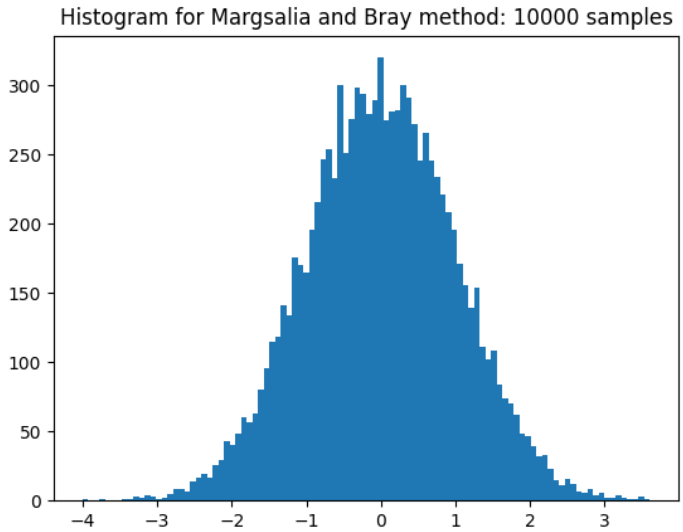
Samples	Mean	Variance
100	0.0091	1.0821
10000	0.0055	1.0074

(b)



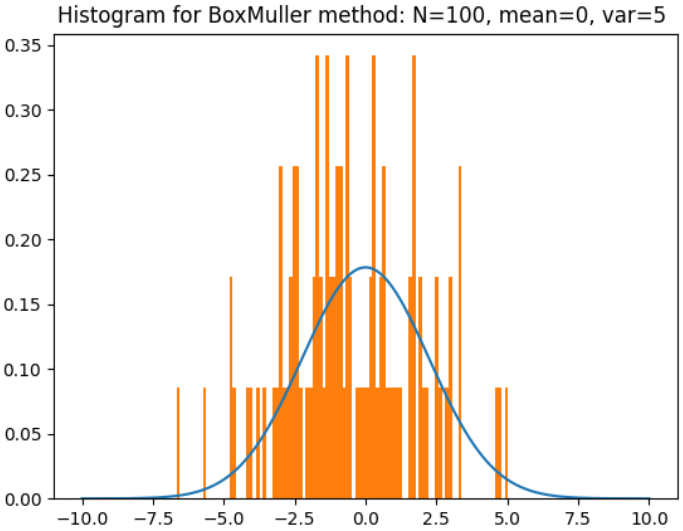


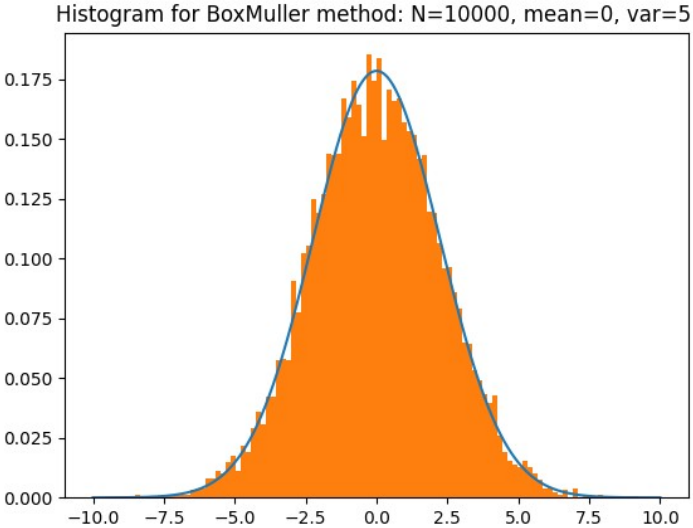


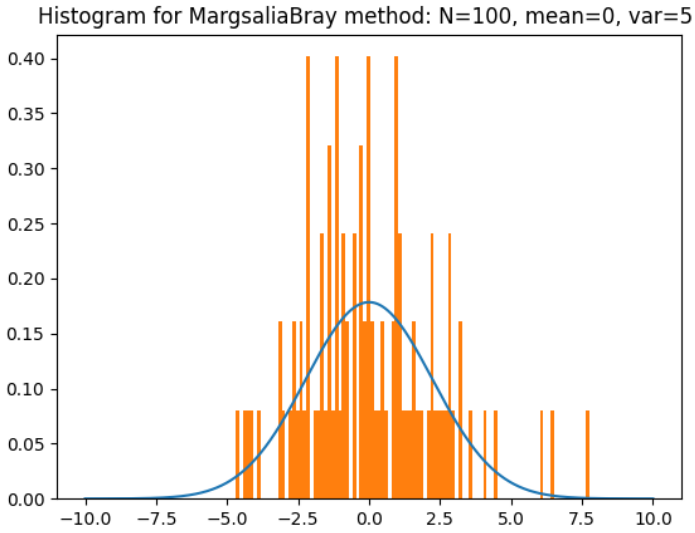


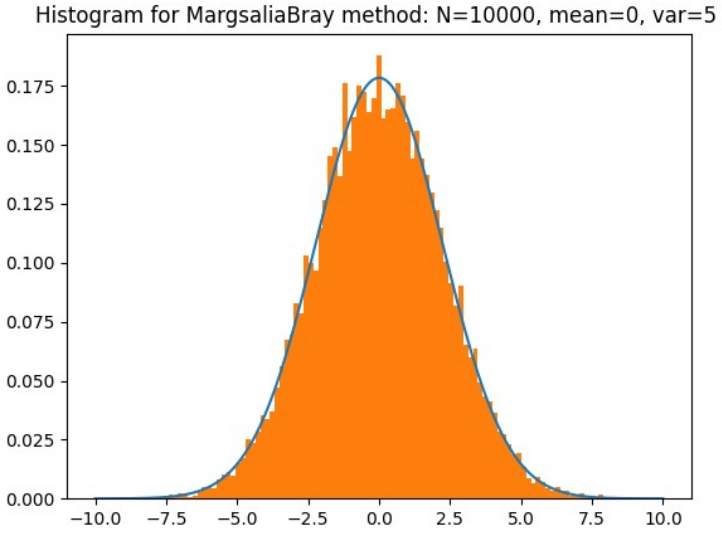
(c)

Mean = 0 and Variance = 5

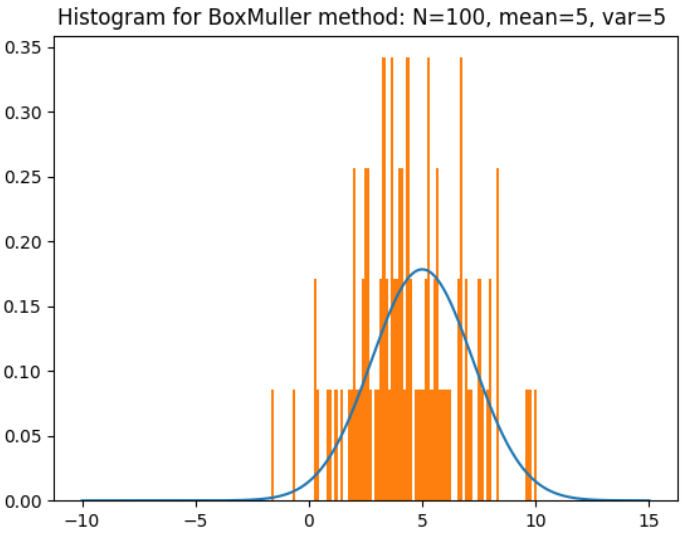


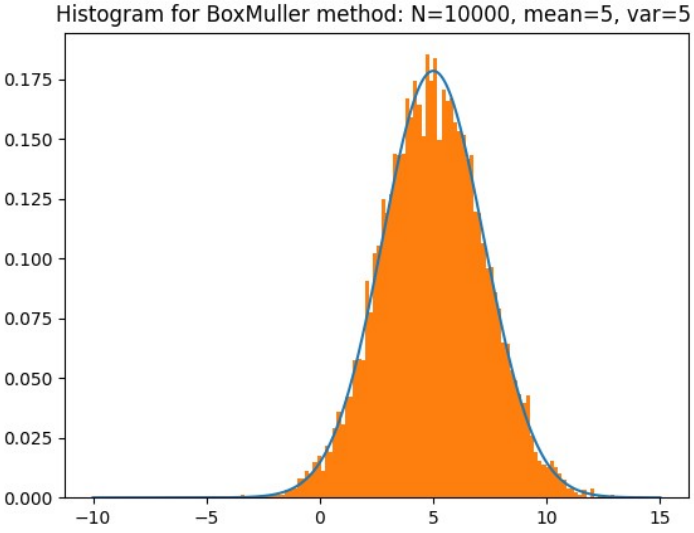


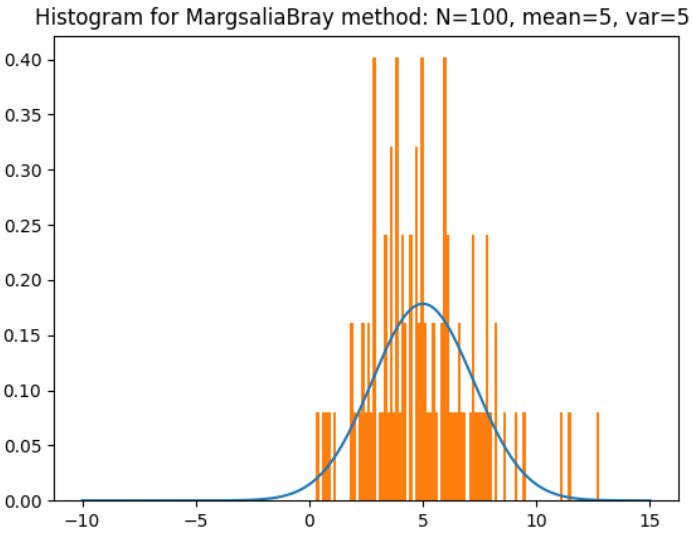


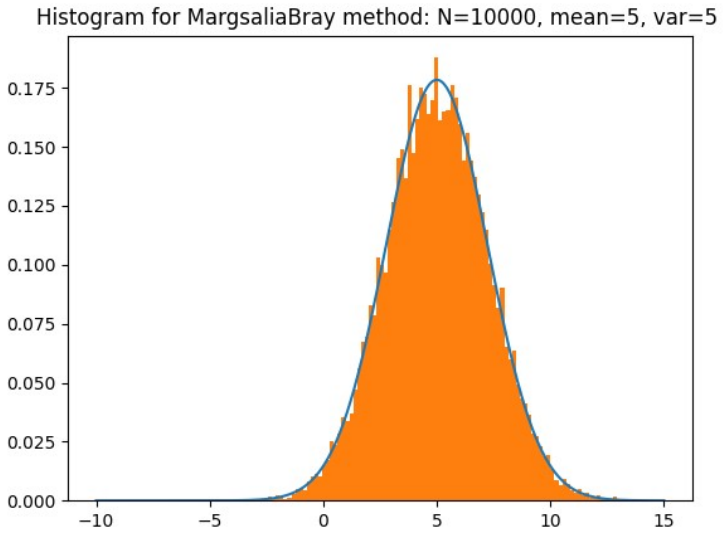


Mean = 5 and Variance = 5









Observations:

The distribution of the samples generated becomes closer to the actual distribution as the number of samples generated increases.

2)

Method	Samples	Time
Box Miller	100	0.000687s
Margsalia and Bray	100	0.000239s
Box Miller	10000	0.060631s
Margsalia and Bray	10000	0.019995s

Observations:

Margsalia and Bray method is faster because it does not use any complex functions, whereas in Box Miller method the sin and cos operations are very expensive and thus make it slower.

3)

For 100 samples, portion of values rejected = 0.166667
For 10000 samples, portion of values rejected = 0.214947

1-π/4 = 0.214601

Oberservations:

The value of the rejected portion matches with the value of 1- π/4