Assignment 7

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Question 1

Formula Used-

= = , where

where n = M/2.

95% confidence interval = ( , ) where n = M/2 and santi as defined above.

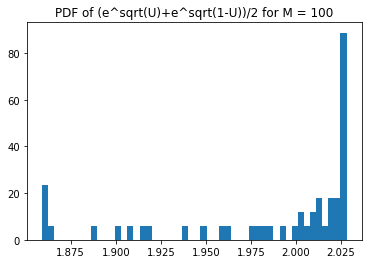
For different values of M, IM and 95% confidence interval obtained from the generated sample are as below –

i) M = 100

IM = 1.9835514858163157

95% confidence interval =

(1.9680162496788438, 1.9990867219537876)

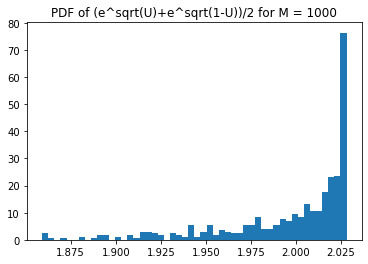


ii) M = 1000

IM = 1.9970388257694407

95% confidence interval =

(1.993776847093539, 2.0003008044453425)

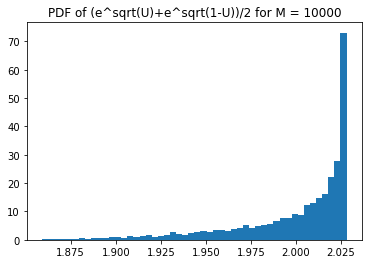


iii) M = 10000

IM = 1.9993787032361658,

95% confidence interval =

(1.998451217156572, 2.0003061893157597)

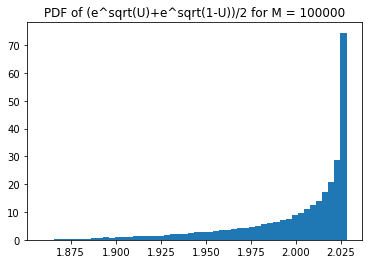


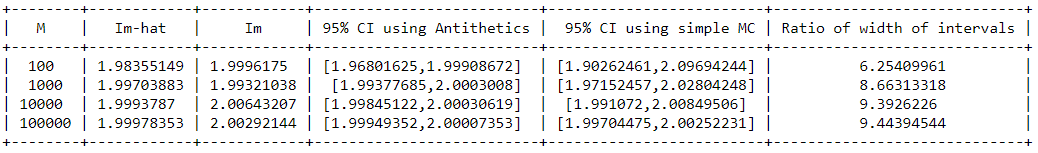
iv) M = 100000

IM = 1.9997835287779493,

95% confidence interval =

(1.9994935248575483, 2.0000735326983503)



Question 2

Ratio of width of interval =

Actual value of I =

As value of M increases, and both gets closer to actual value of I.

For same value of M, is closer to I than for all M except for M = 100. For M = 100, it is just luck due to small sample space.

Width of confidence intervals in antithetic method are smaller as compared to simple monte carlo and this ratio increases with increase in M.