PSet5 Report

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1 Generating Uniform Random Numbers

As we expected the amount of numbers generated for each digit is about $\frac{N}{10}$. Fig1 I plotted the

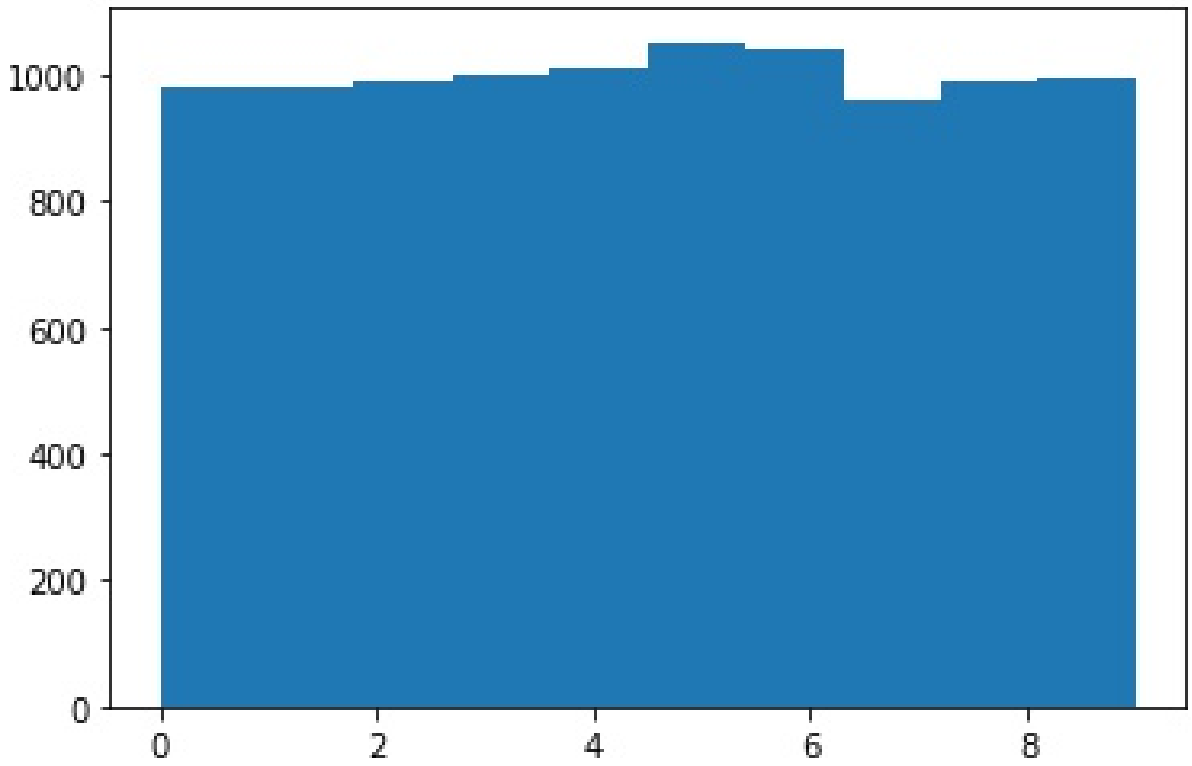

Figure 1: Hist plot of N numbers generated uniformly from 0 to 9

equation and as expected we see that the equation holds for this generator.

This is very similar to the Random walk –random generation– in which both express the cenetral limit property. Fig1

2 Entanglement

Did what the question asked me to do and got the uniform distribution histogram again, meaning that there are no entanglements. Fig2

3 Central Limit Theorem

I generated rands with the length of N and summed them to get to the central limit theorem. The hist plots are available in Fig3 In all these exercises we witness that the higher the size N, the nearer the distribution is to a gaussian function.

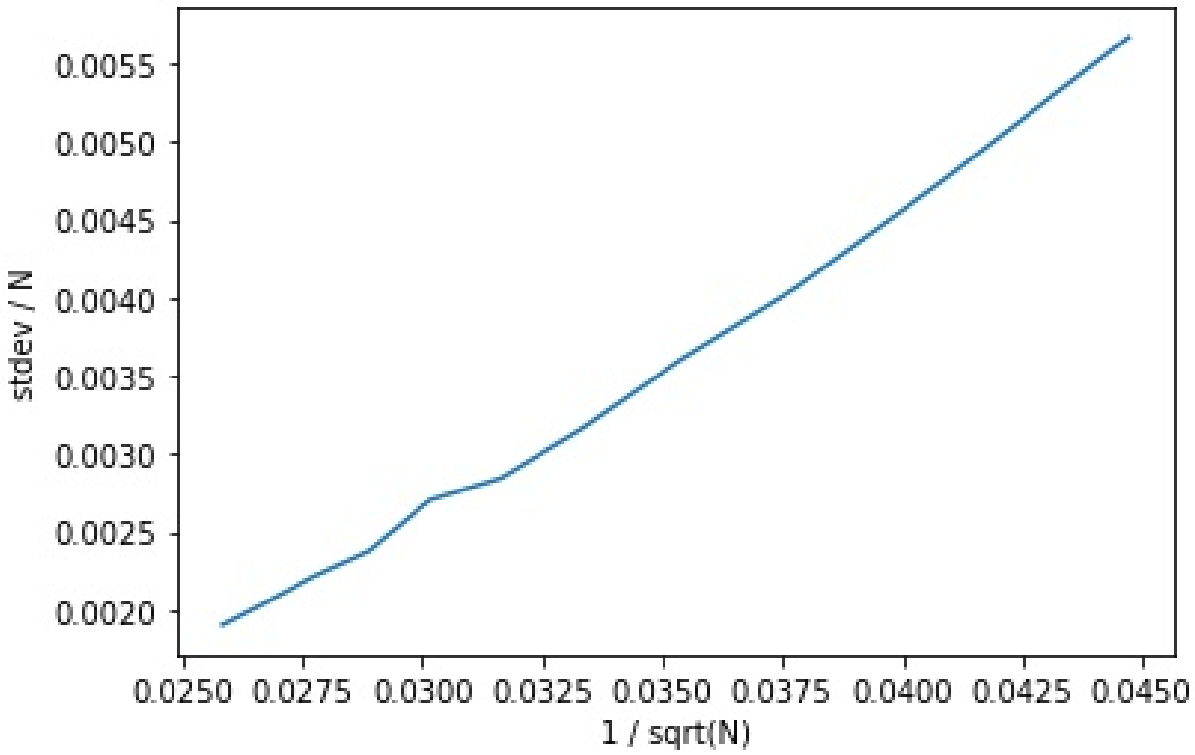

Figure 2: plot to show the expression of central limit phenomena

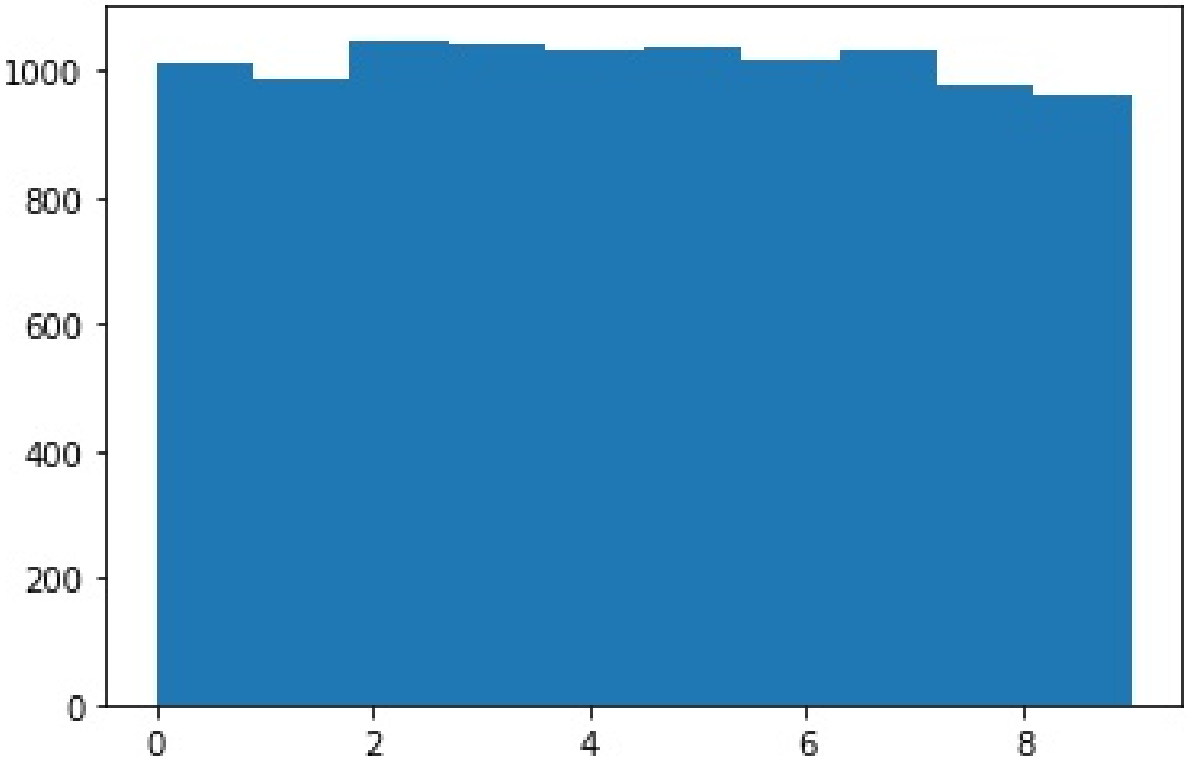

Figure 3: The uniform plot after plotting the histogram for numbers generated after every 4

4 Transforming the Distribution Function

I used the method seen in the code to generate the gaussian distribution in 2 dimentions. Here are the results for different numbers. Fig4

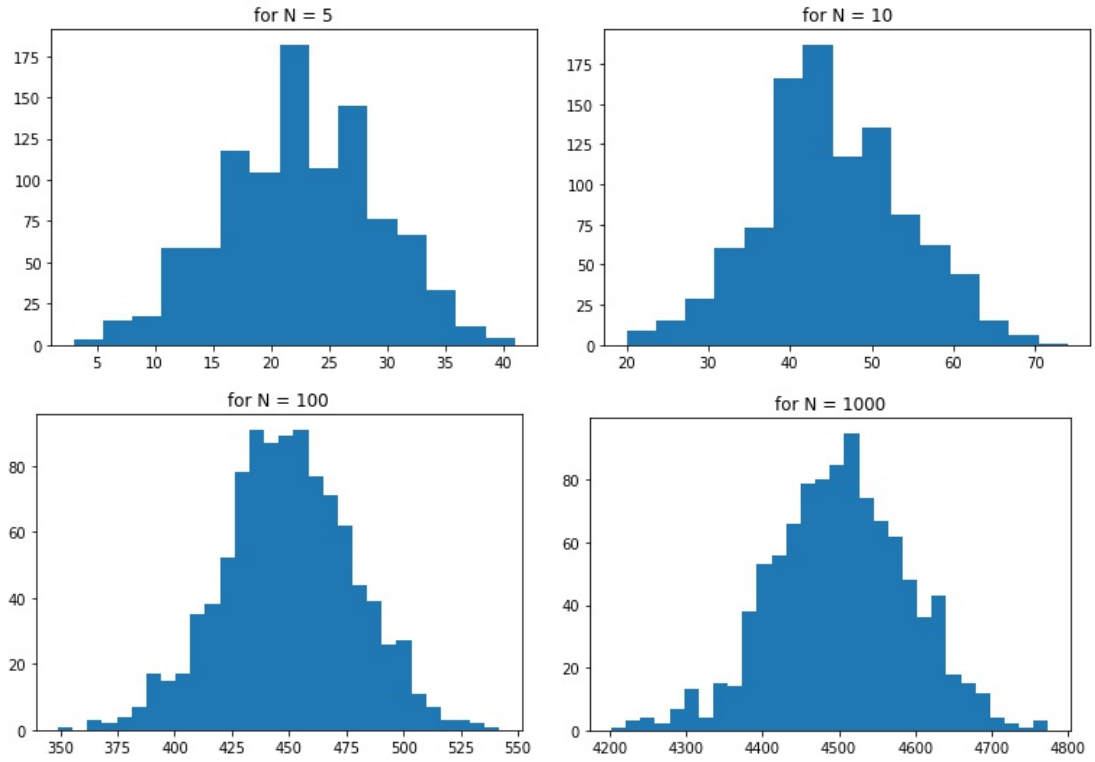

Figure 4: Central limit for lengths of 5, 10, 100, 1000

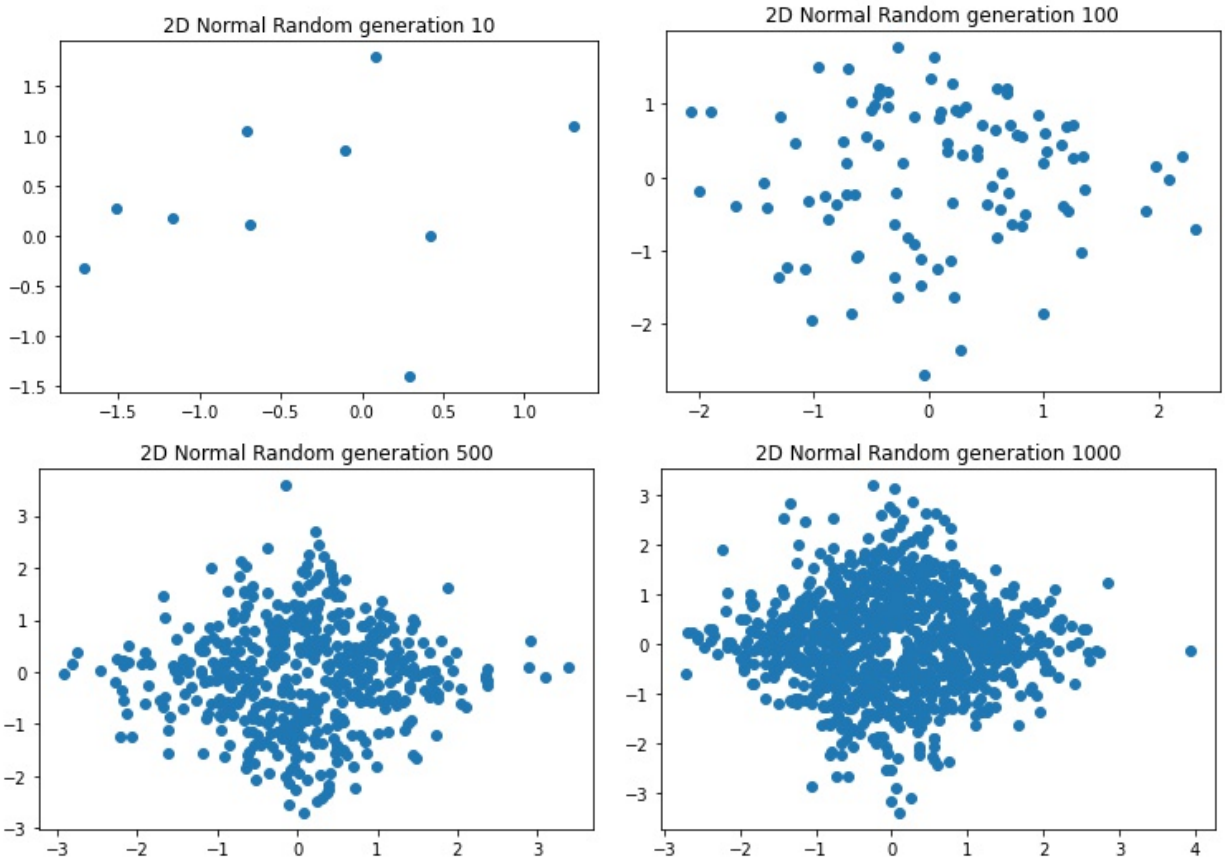

Figure 5: 2 dimentional normal distribution for sizes 10, 100, 500, 1000