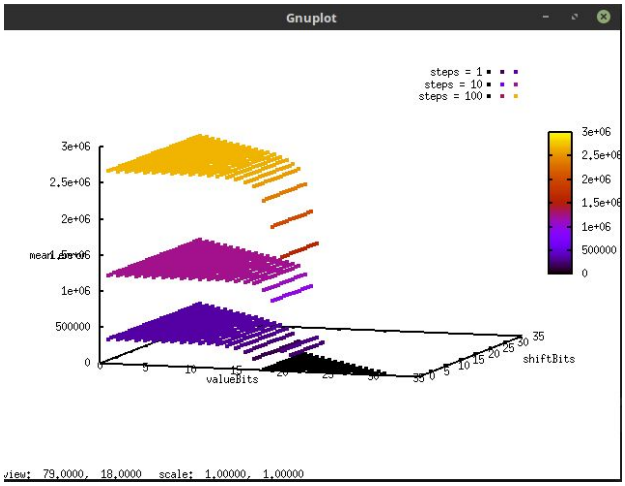
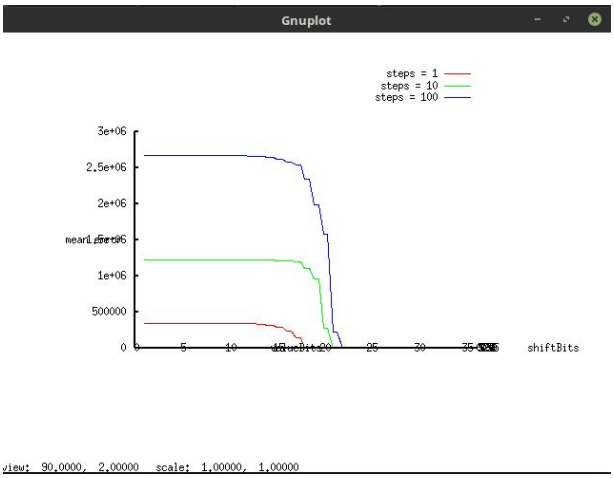
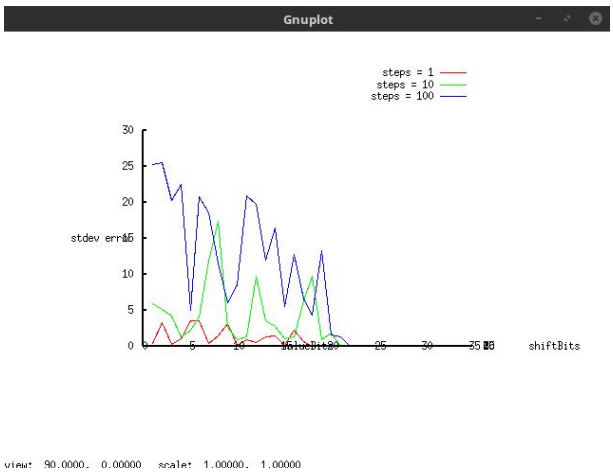
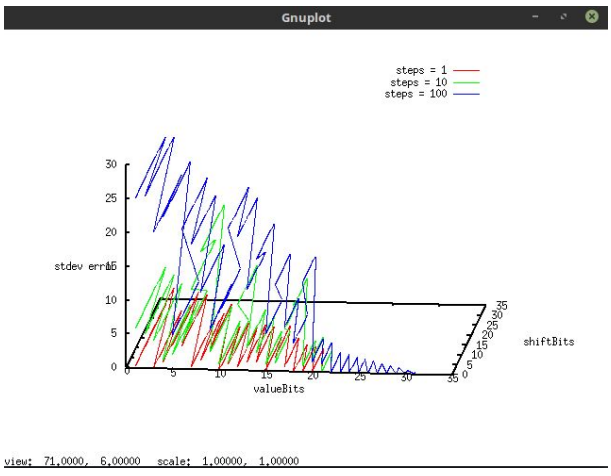




A 3D plot of average error, value bits, and shift bits for 1, 10 and 100 steps. The error value is at maximum until it approaches 20 value bits, which is the minimum required to store 1,000,000 (which was the maximum step size). Once there were enough value bits to store a little over a million, error quickly dropped to zero. Adding in extra shift bits helped, but only marginally. I think this is because of the way I get random floats usually only producing a few decimals. And anything more than 3 shift bits being enough to store the maximum shift needed by the program.

Running the simulation with different numbers wouldn't make much of a difference. The error on each axis would be the same on average, but the errors wouldn't be as pronounced, since calculating the distance amplifies any underlying errors





The 3D plots of standard deviation were much harder to interpret. Its a chaotic mess, that trends to less error the more value bits you allow. I am not sure why, for example, 5 value bits had such a low standard deviation compared to 6 value bits. I was unable to get a clean and clear graph out of the data for stdev