MA-423 : Matrix Computation Lab

Lab Assignment – 01

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Mathematics and Computing

Question - (12)

(a) Number of days the hacker would take to become a millionaire assuming the illegal account begins with a balance of zero is approximately equal to **3189.**

(b) Average balance in an account initially (using the fact that the numbers are uniformly generated):

$$(100000 + 100)/2 = 50050$$

On an account with initial balance equals to the average balance, interest on 1st day = $(0.05/365) * 50050$ = 6.8561643835

Amount Added to illegal account from this account = 0.006164.

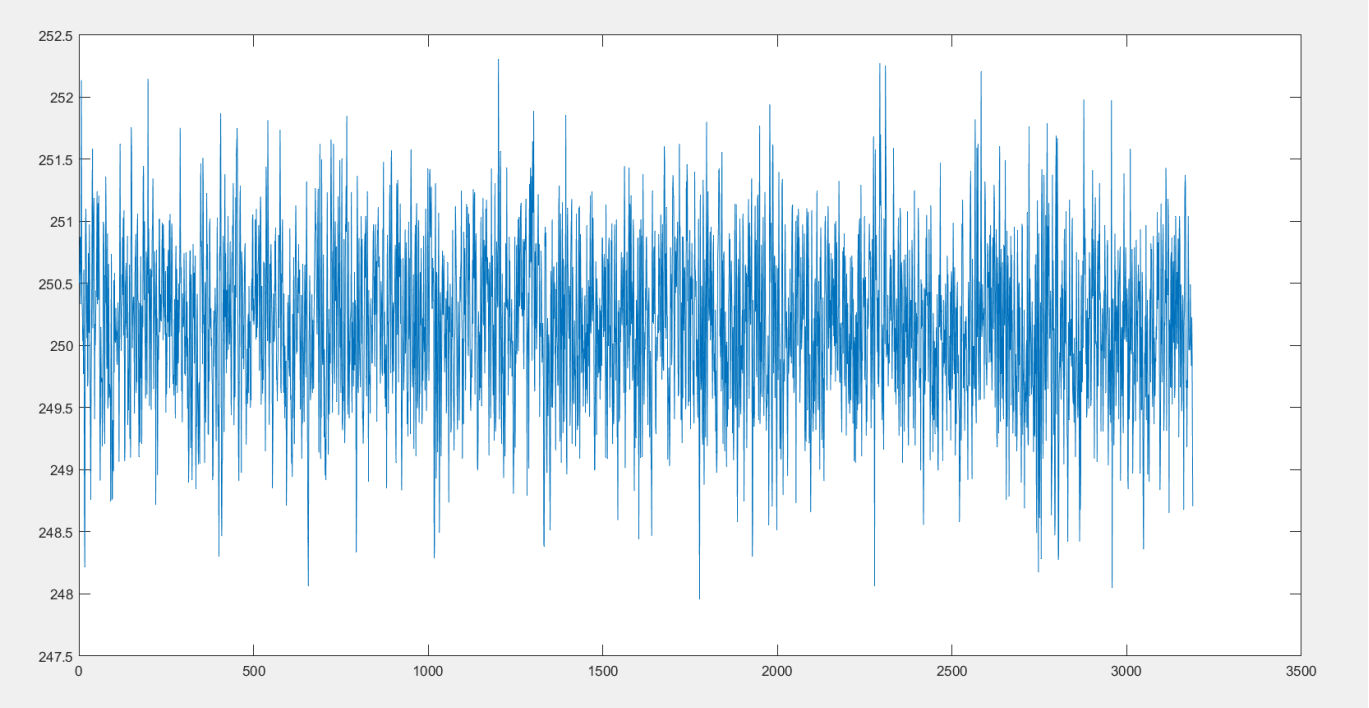
This amount will always lie in the range [0, 0.01).

So, average amount added to illegal account can be taken as 0.005, considering uniform distribution of 1/100th of the cent).

Therefore amount added each day = 50000 * 0.005$ = 250$

So, days required for the hacker to become millionaire = 1000000/250 = 4000 days approximately.

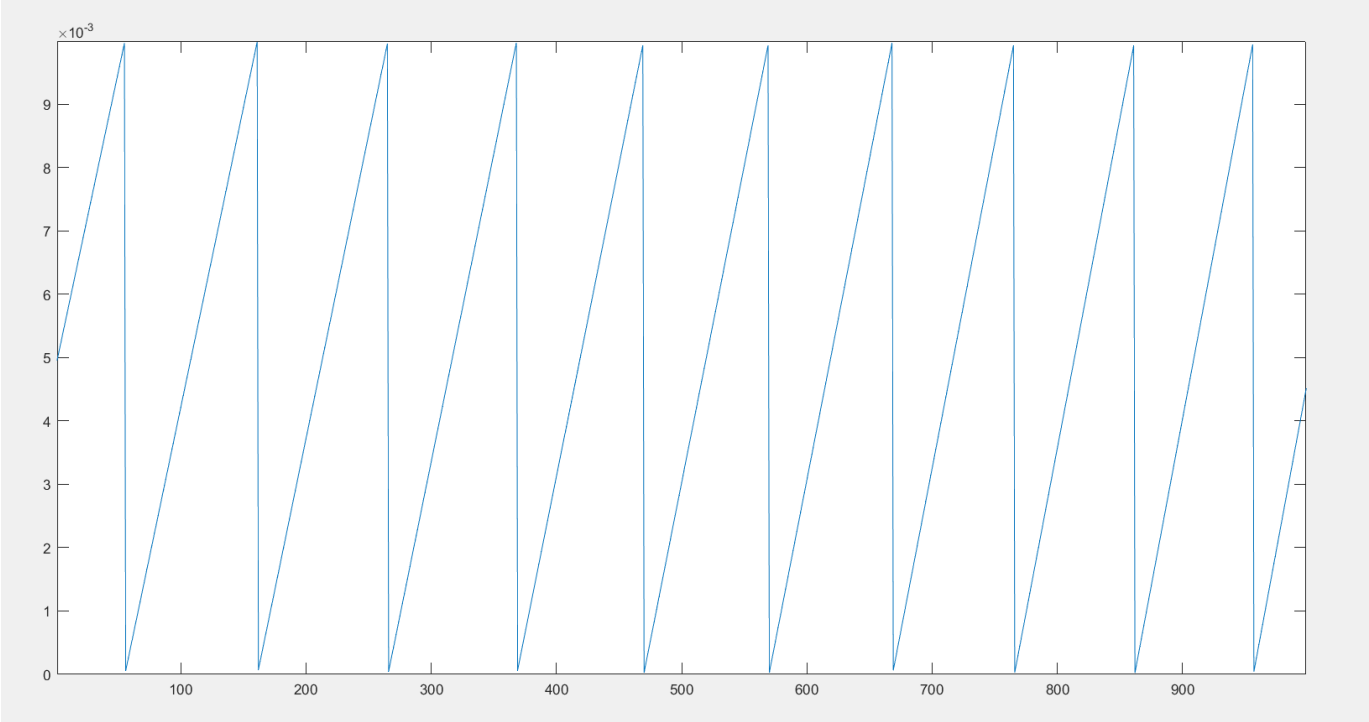
Graph for amount added each day:



It can be clearly seen from the graph that amount added each day lies around 250$.

Similarly, when there are 100000 accounts, amount added each day = 100000 * 0.005 = 500$.(Assuming uniform distribution of 1/100th of a cent is uniformly distributed).

Graph for ‘amount added each day from a single account’:



Since this graph is linear,and it lies between [0, 0.01), average amount added each day from a single account comes out to be (0 + 0.01)/2 = 0.005$.