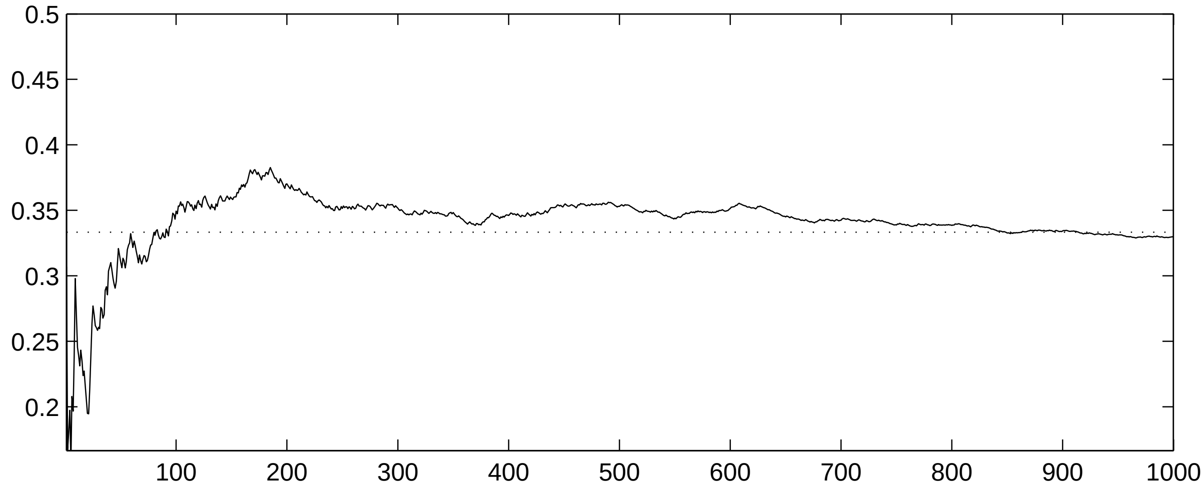
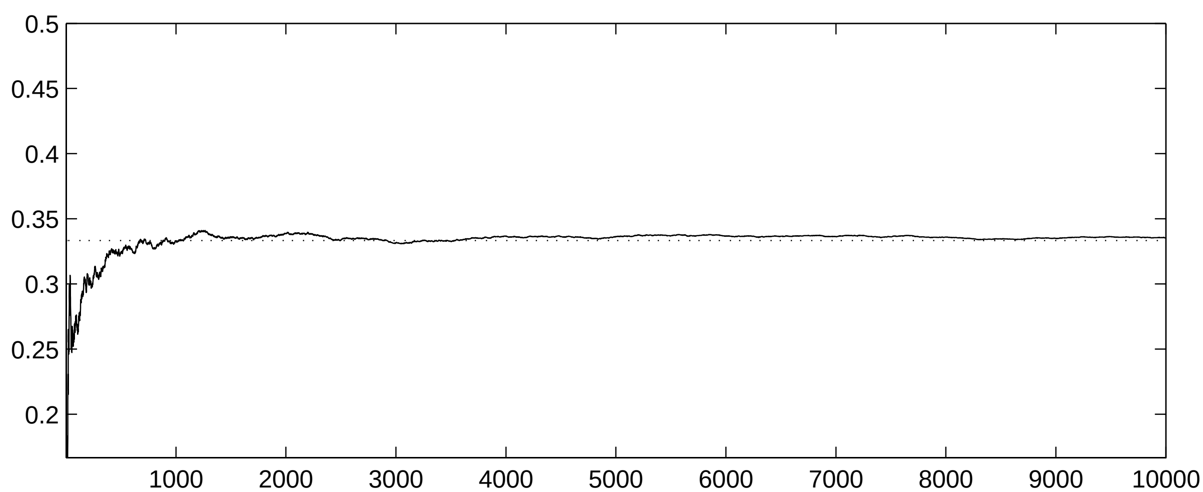
LLN_UniformSq.m

```
function [n,RunningAve,TrueMean] = LLN_UniformSq(N)

% function [n,RunningAve,TrueMean] = LLN_UniformSq(N)
%
%  The Law of Large Numbers for the squared uniform distribution.
%
%  Choose N i.i.d. random variables from the distribution of U^2,
%  where U is the uniform distribution on the interval [0,1].
%  For each n = 1:N, compute the running average of the first n
%  random variables.  Also, for each n record the true mean
%  (which is 1/3) so that the results can be easily plotted with
%  plot(n,RunningAve,n,TrueMean).

RunningSum = 0;          % initialize the sum of the random variables
for k = 1:N

    Usq = rand^2;  % rand returns (approximately) a sample from the uniform
                   % distribution on [0,1].  Successive calls to rand give
                   % (approximately) independent samples.  So Usq are
                   % i.i.d. samples from squared uniform distribution.

    RunningSum = RunningSum + Usq;
    RunningAve(k) = RunningSum / k;
    TrueMean(k) = 1/3;
end

n = [1:N];

return
```



The above figure was made with the following commands:

```
[n,RunningAve,TrueMean] = LLN_UniformSq(1000);
plot(n,RunningAve,'-',n,TrueMean,':')
axis([1 1000 1/6 3/6])
```



The above figure was made with the following commands:

```
[n,RunningAve,TrueMean] = LLN_UniformSq(10000);
plot(n,RunningAve,'-',n,TrueMean,':')
axis([1 10000 1/6 3/6])
```