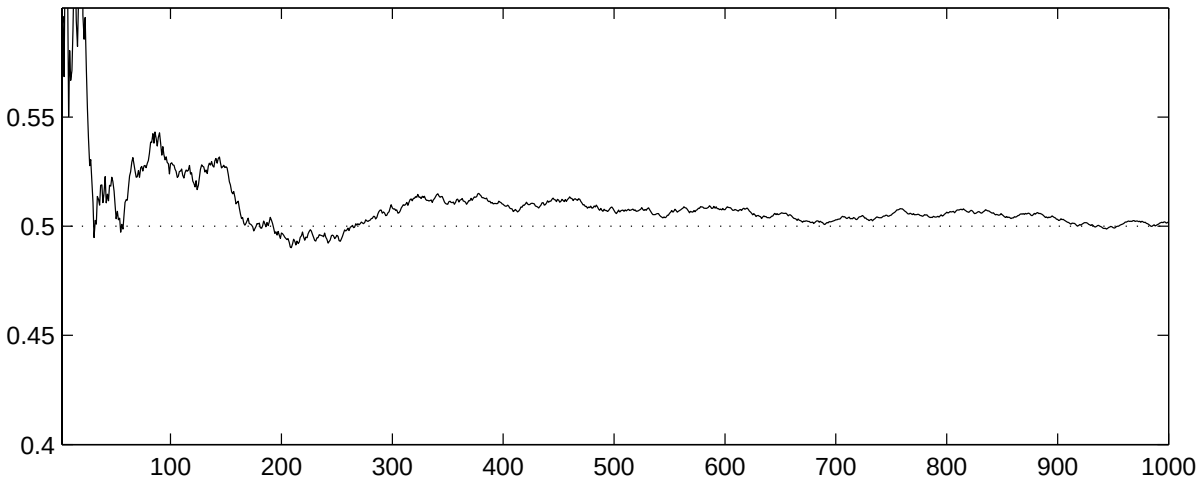
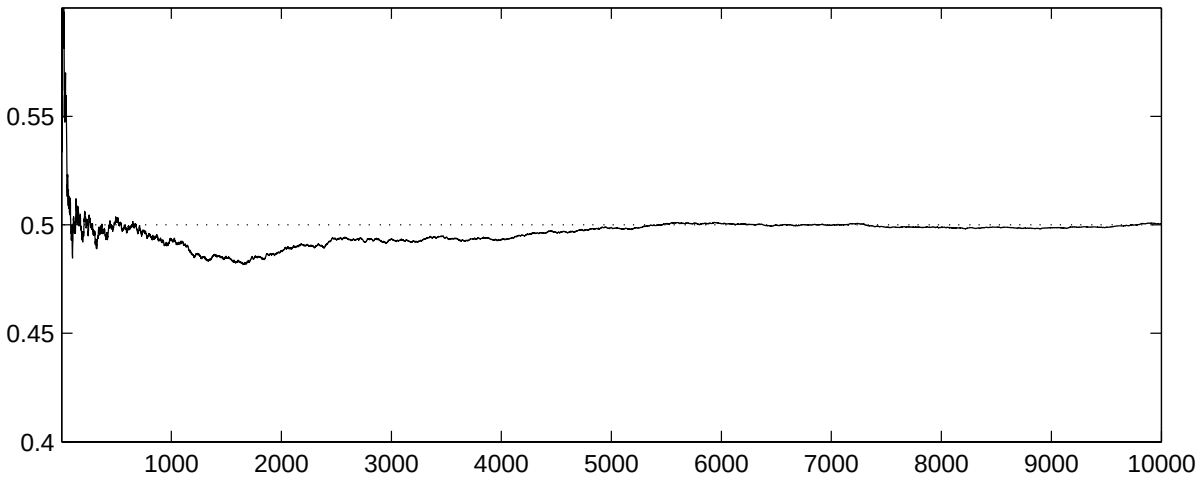
LLN_Uniform.m

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

% function [n,RunningAve,TrueMean] = LLN_Uniform(N)
%
%  The Law of Large Numbers for the uniform distribution.
%
%  Choose N i.i.d. random variables from 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 .5) 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

    U = rand;      % rand returns (approximately) a sample from the uniform
                   % distribution on [0,1].  Successive calls to rand give
                   % (approximately) independent samples.

    RunningSum = RunningSum + U;
    RunningAve(k) = RunningSum / k;
    TrueMean(k) = 0.5;
end

n = [1:N];

return
```



The above figure was made with the following commands:

```
[n,RunningAve,TrueMean] = LLN_Uniform(1000);
plot(n,RunningAve,'-',n,TrueMean,':')
axis([1 1000 .4 .6])
```



The above figure was made with the following commands:

```
[n,RunningAve,TrueMean] = LLN_Uniform(10000);
plot(n,RunningAve,'-',n,TrueMean,':')
axis([1 10000 .4 .6])
```