



Figure: Expected Value vs e

N = 1000  
n = 100  
E = 2.7110

N = 10000  
n = 100  
E = 2.7109

N = 100000  
n = 100  
E = 2.7181

## 2.4 MATLAB CODE

```
% Minima of Uniform Random Variables

N = 1000; % Large Sequence
n = 100;
K = zeros(1,N);

for x = 1:N

    % Generate uniformly distributed random numbers
    u = rand(1,n);
    i = 1;

    % Check whether  $U_i < U_{i+1}$ 
    while u(i) < u(i+1)
        i = i+1;
    end

    % Obtaining the minimum of the sum
```

```

        K(x) = i+1;
end

E1 = mean(K);

% Minima of Uniform Random Variables

N = 10000; % Large Sequence
n = 100;
K = zeros(1,N);

for x = 1:N

    % Generate uniformly distributed random numbers
    u = rand(1,n);
    i = 1;

    % Check whether  $U_i < U_{i+1}$ 
    while u(i) < u(i+1)
        i = i+1;
    end

    % Obtaining the minimum of the sum
    K(x) = i+1;
end

E2 = mean(K);

% Minima of Uniform Random Variables

N = 100000; % Large Sequence
n = 100;
K = zeros(1,N);

for x = 1:N

    % Generate uniformly distributed random numbers
    u = rand(1,n);
    i = 1;

    % Check whether  $U_i < U_{i+1}$ 
    while u(i) < u(i+1)
        i = i+1;
    end

    % Obtaining the minimum of the sum
    K(x) = i+1;
end

E3 = mean(K);

e = [E1 exp(1); E2 exp(1); E3 exp(1)]
bar(e,0.33)
title('Minima of Uniform Random Variables');
ylabel('Value of  $E[N]$ ');
legend('Estimated Value','Actual Value');
set(gca, 'XTick', 1:3, 'XTickLabel', {'N = 1000', 'N = 10000', 'N = 100000'})

```