

N = 1000
n = 100
E = 2.6930

N = 10000
n = 100
E = 2.7255

N = 100000
n = 100
E = 2.7176

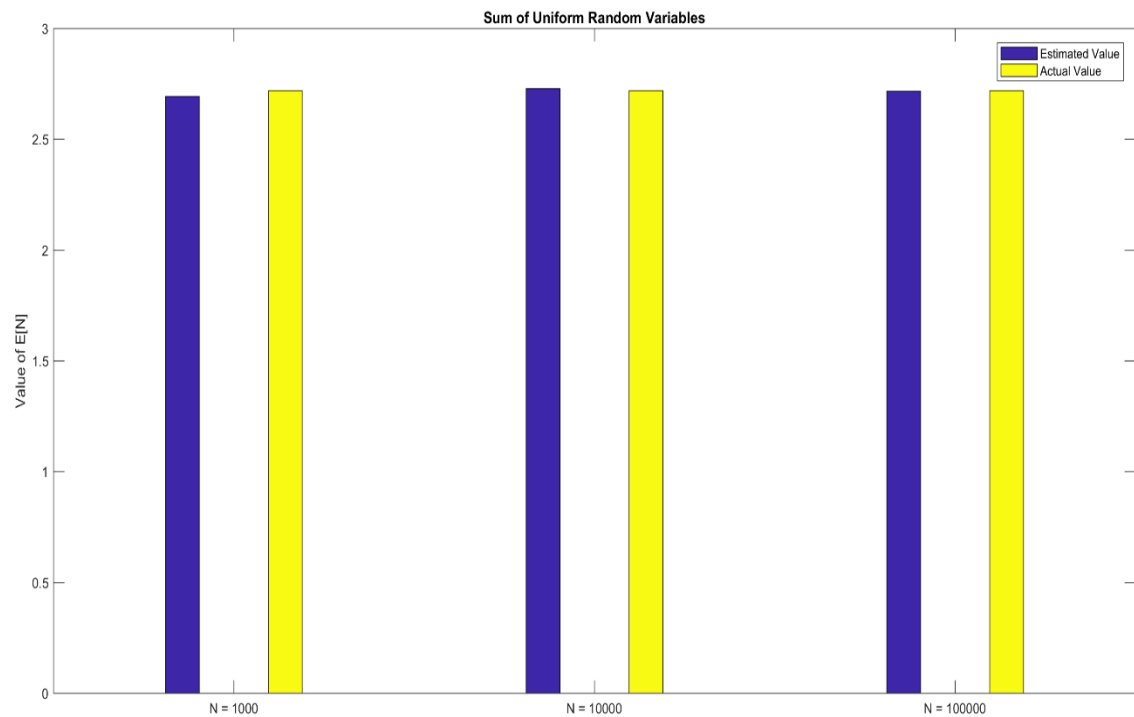


Figure: Expected Value vs e

1.4 MATLAB CODE

```
% Sum 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 the sum of Ui and Ui+1 <=1
    while sum(u(1:i)) <=1
        i = i+1;
    end
```

```

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

E1 = mean(K)

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 the sum of  $U_i$  and  $U_{i+1} \leq 1$ 
    while sum(u(1:i)) <= 1
        i = i+1;
    end

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

E2 = mean(K)

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 the sum of  $U_i$  and  $U_{i+1} \leq 1$ 
    while sum(u(1:i)) <= 1
        i = i+1;
    end

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

E3 = mean(K)

e = [E1 exp(1); E2 exp(1); E3 exp(1)]
bar(e,0.33)
title('Sum 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'})

```