
```
clc
clear
close all
format long g

%display name and assignment details
disp('Zyad Khan - MATLAB Chapter 10 Assignment')

%Problem 1 - Sequence
syms k
f(k)=(1)/((k)*(k+1));
sequence = eval(subs(f(k),k,1:25));
convergence = limit(f(k),k,inf);

%Graph the Sequence
plot(sequence , 'o');
grid on; hold on;
title('Graph of the Sequence')
legend('Sequence')

%Determine Convergence or Divergence
if isfinite(convergence)
    fprintf('The sequence %s converges and approaches the value of\n',f(k),convergence)
else
    fprintf('The sequence diverges.')
end

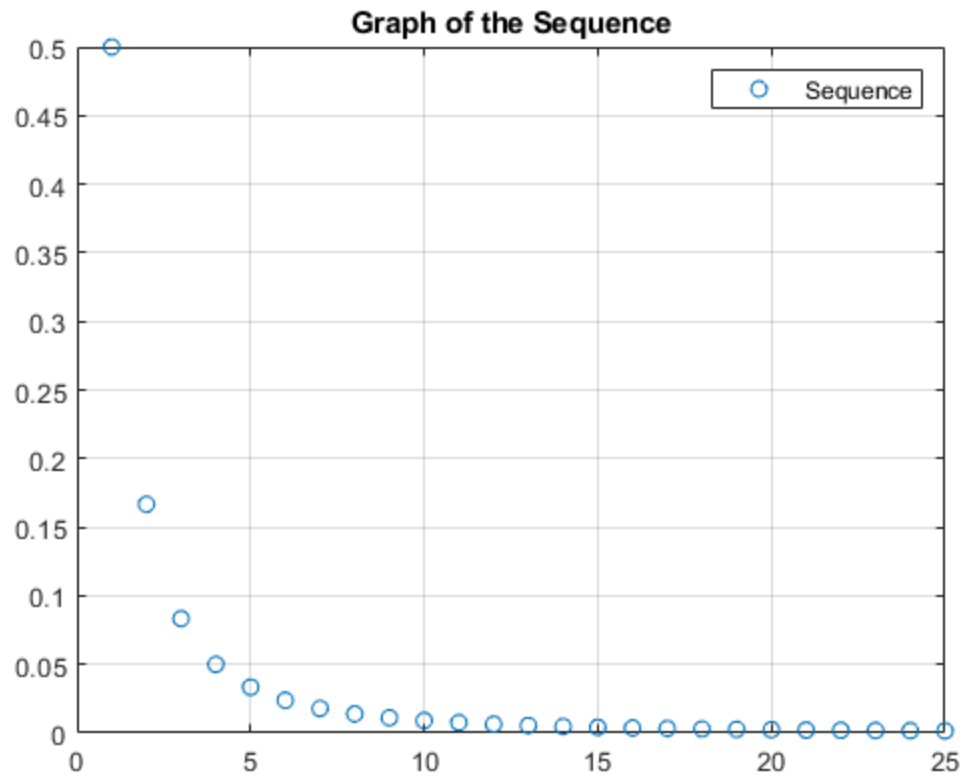
%Problem 2 - Infinite Series
syms n
f(n)=(1)/((n)*(n+1));
sum = eval(subs(f(n),n,1:4));
partialSums=cumsum(sum);
disp(['The first term of the partial sums for the infinite series '
    char(f(n)) 'is ' num2str(partialSums(1)) '.']);
disp(['The second term of the partial sums for the infinite series '
    char(f(n)) 'is ' num2str(partialSums(2)) '.']);
disp(['The third term of the partial sums for the infinite series '
    char(f(n)) 'is ' num2str(partialSums(3)) '.']);
disp(['The fourth term of the partial sums for the infinite series '
    char(f(n)) 'is ' num2str(partialSums(4)) '.']);

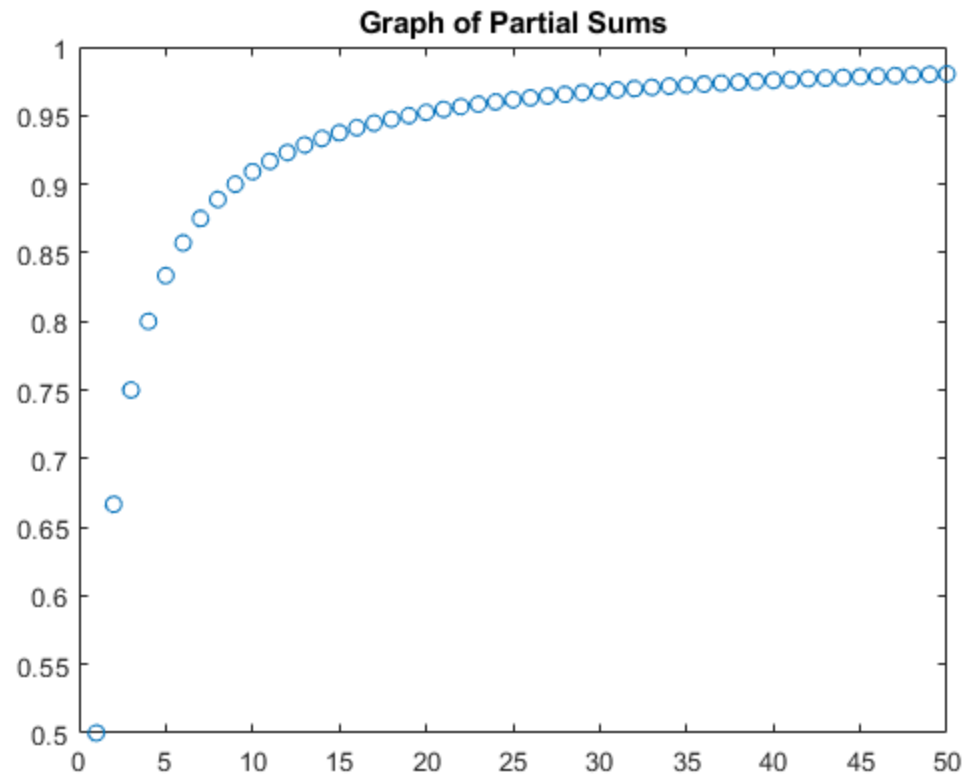
%Graph the Infinite Series
figure(2)
partial50 = eval(subs(f(n),n,1:50));
partialSums50 = cumsum(partial50);
plot (partialSums50, 'o')
title('Graph of Partial Sums')

fprintf('The series converges and approaches the value %.1f.\n',
    partialSums50(50))

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The sequence $1/(k*(k + 1))$ converges and approaches the value of 0.
The first term of the partial sums for the infinite series $1/(n*(n + 1))$ is 0.5.
The second term of the partial sums for the infinite series $1/(n*(n + 1))$ is 0.66667.
The third term of the partial sums for the infinite series $1/(n*(n + 1))$ is 0.75.
The fourth term of the partial sums for the infinite series $1/(n*(n + 1))$ is 0.8.
The series converges and approaches the value 1.0.





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