```
%
 ==========================================================================
% AUTHOR ..... [Lishan Huang]
% UPDATED .... [Jan 15]
%
```

expTaylorPoly function

expTaylorPoly.m

```
%
 ==========================================================================
% AUTHOR ..... [Lishan Huang]
% UPDATED .... [Jan 15]
%
% Evaluate the truncated Taylor series for exp(x) about the point x0 =
 0
%
% INPUT
% x .... Vector of values to evaluate the Taylor polynomial at
% n .... Integer of last term to evaluate in Taylor polynomial
%
% OUTPUT
% T : Evaluated Taylor polynomial at points given by x degree n
%
 ==========================================================================
function T = expTaylorPoly(x, n)
% Initialize sum as 0
T = 0;
% Loop over terms in series
for k = 0:n
    T = T + x.^k / factorial(k);
end
end
```

expHorner function

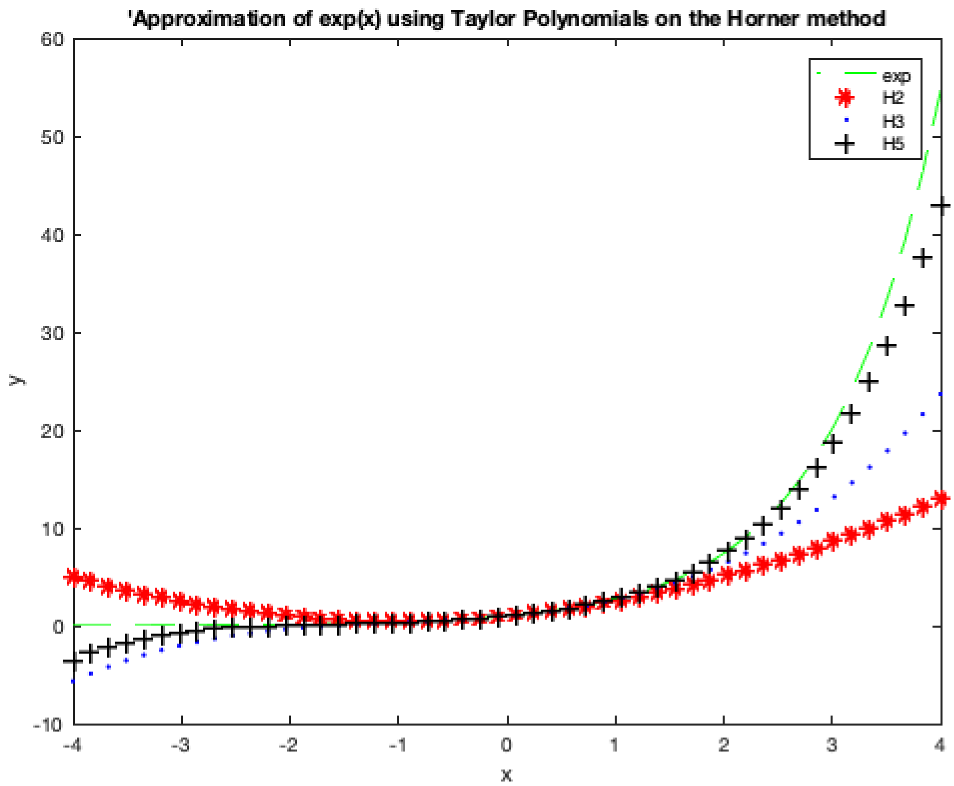
expHorner.m

```
%
 ==========================================================================
% AUTHOR ..... [Lishan Huang]
% UPDATED .... [Jan 15]
%
% Evaluate exp(x) about the point x0 = 0 using Horner's method
%
% INPUT
% x .... Vector of values to evaluate the Taylor polynomial at
% n .... Integer of last term to evaluate in Taylor polynomial
```

```
%
% OUTPUT
% H : Evaluated Taylor polynomial at points given by x degree n
%
 ===========================================================================
function H = expHorner(x, n)
% Initialize sum as 0
H = 1;
for k = n:-1:1
    H =  1 + x.* H/k;
end
end
```

Script

```
%The following is a code that Plotted the approximates of exp(x) on
 the
%Horner method and use exp function directly
clf;
close all;
clear all;
%50 equally-spaced x values between -4 and 4
x = linspace(-4,4,50);
%Evaluate exp(x)
e=exp(x);
%Evaluate the exp(x) Taylor Polynomial on the Horner method in at n =
 2
H2 = expHorner(x,2);
%Evaluate the exp(x) Taylor Polynomial on the Horner method at n = 3
H3 = expHorner(x,3);
%Evaluate the exp(x) Taylor Polynomial on the Horner method at n = 5
H5 = expHorner(x,5);
% Plotting the approximates of exp(x)
plot(x,e,'--g',x,H2,'*r',x,H3,'.b',x,H5,'+k')
% add the legend to the graph
legend('exp','H2', 'H3', 'H5')
% add the label of the graph
title("'Approximation of exp(x) using Taylor Polynomials on the Horner
 method")
xlabel('x')
ylabel('y')
```



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