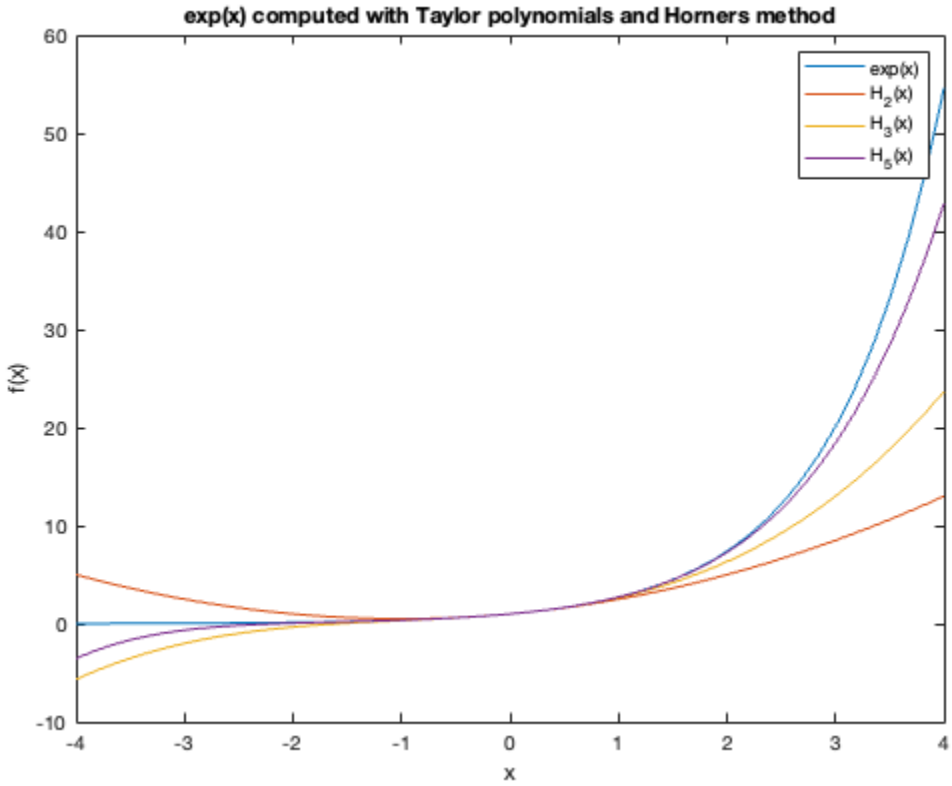
```
clc
clear clf
close all

type expTaylorPoly.m;

x = linspace(-1, 1, 2019);
T = expTaylorPoly(x, 10);

% what happens when empty?
% own example
linspace(0, 0, 100);


% x^2 this doesnt work, bad dimensions


% dot for elementwise
x.^2;

plot(x, T)
plot(x, T, x, x)
loglog(x, T) % own example, try loglog plot

type expHorner.m;
type plotOfExp.m;

evalc plotOfExp;


% ========================================================================
% AUTHOR ..... David
% UPDATED .... 2024.01.18
%
% 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
```

```
% ========================================================================
% AUTHOR ..... David Tran
% UPDATED .... 2024.01.18
%
% 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)
    H = 1
    for k = n : -1 : 1
        H = 1 + x .* H ./ k
    end
end

xs = linspace(-4, 4, 50);
expCurve = exp(xs);
h2Curve = expHorner(xs, 2);
h3Curve = expHorner(xs, 3);
h5Curve = expHorner(xs, 5);

plot(xs, expCurve, xs, h2Curve, xs, h3Curve, xs, h5Curve);
legend('exp(x)', 'H_2(x)', 'H_3(x)', 'H_5(x)');
title('exp(x) computed with Taylor polynomials and Horners method');
xlabel('x')
ylabel('f(x)')
```



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