Homework 1 Problem 2

AE370 - Spring 2018
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```
N = 1:30; % Number of Intervals
intLB = 0; % Integral Lower Bound
intUB = 2*pi; %Integral Upper Bound

IRECT = [];
ITRAP = [];
%Nested For Loops
%% First Loop: Iterates through number of intervals
%% Second Loops: Iterates depending on the number of intervals to calculate Irect o
for j=1:length(N)
    n = N(j);
    h = (intUB - intLB)/n;      %Length of each SubInterval

    %Creates Array for Interval Range given number of intervals
    xi = intLB;
    for i=1:n
        xi = [xi xi(i)+h];
    end

    %% Rectangule Rule
    Irect = 0;
    for i=1:n
        xx = (xi(i)+xi(i+1))/2;
        fxx = (cos(xx^3 + 3*xx))/(exp(xx^2));
        Irect = Irect + fxx;
    end
    IRECT = [IRECT Irect];

    %% Trapezoid Rule
    Itrap = 0;
    for i=1:n
        fx1 =(cos(xi(i)^3 + 3*xi(i)))/(exp(xi(i)^2));
        fx2 = (cos(xi(i+1)^3 + 3*xi(i+1)))/(exp(xi(i+1)^2));
        Itrap = Itrap + (h/2)*(fx1+fx2);
    end
    ITRAP = [ITRAP Itrap];
end

%Plotting Code Not Shown
```