```
% Q1 GTE
% 2 - x + ln(x)

% True Value of the integration of the function from b to a :-
a = 1;
b = 2;
n = 100;
truVal = integratedf(b) - integratedf(a);

% Error using Trapezoid Rule :-

trap = numericalIntegration(@f, a, b, n, 1);

errTrap = abs(trap - truVal);

% Error using Simpson's One Third Rule :-

oneThird = numericalIntegration(@f, a, b, n, 2);

errOneThird = abs(oneThird - truVal);

% Error using Simpson's Three Eighth Rule :-

threeEighth = numericalIntegration(@f, a, b, n, 3);

errThreeEighth = abs(threeEighth - truVal);

% Display errors :-

disp(['The error using Trapezoidal Rule : ', num2str(errTrap)]);
disp(['The error using Simpson''s One Third Rule : ',
 num2str(errOneThird)])
disp(['The error using Simpson''s Three Eighth Rule : ',
 num2str(errThreeEighth)])

% Plots :-

semilogy(1, errTrap,'ro', 2, errOneThird, 'go', 3,
 errThreeEighth, 'bo')
legend('Trapezoidal Rule', 'Simpson''s One Third Rule', 'Simpson''s
 Three Eighth Rule')
title('LTE for numerical integration of 2 - x + ln(x)')
xlabel('Methods of Numerical Integration')
ylabel('Error')

% Function to be integrated :-
function fval = f(x)
    fval = 2 - x + log(x);
end

% Integrated Function :-
function fx = integratedf(x)
```

```
    fx = 2.*x - (x.^2)./2 + x.*log(x) - x;
end

Unrecognized function or variable 's'.

Error in numericalIntegration>oneThird (line 27)
    h = (b - a)./(2.*n);s

Error in numericalIntegration (line 10)
            fval = oneThird(f, a, b, n);

Error in q1GTE (line 18)
oneThird = numericalIntegration(@f, a, b, n, 2);
```

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