
```

function predictor_corrector_integration()

% Compute average of TUID
TUID = [9,1,5,1,8,7,2,8,9];
alpha = mean(TUID);
fprintf('my TUID average: %.2f\n', alpha);

% Given data
t_values = 0.0:0.1:1.8;
f_values = [1.00, 0.84, 0.78, 0.73, 0.68, 0.65, 0.61, 0.58, 0.55, 0.53, 0.50,
    0.48, 0.45, 0.43, 0.41, 0.39, 0.37, 0.35, 0.33];

h = 0.1;
y = -1; % Initial value

% Predictor-Corrector Scheme
for j = 1:length(t_values)-1
    t = t_values(j);
    % Predictor
    y_star = y(end) + h * dydt(t, y(end), f_values(j), alpha);
    % Corrector
    y_next = y(end) + (h/2) * (dydt(t, y(end), f_values(j), alpha) + dydt(t+h,
    y_star, f_values(j+1), alpha));
    y = [y, y_next];
end

% Plotting
figure;
plot(t_values, y, '-o');
xlabel('t');
ylabel('y(t)');
title('Integration using Predictor-Corrector Scheme');
grid on;

% Estimate the minimum value of y
[min_value, index] = min(y);
t_min = t_values(index);

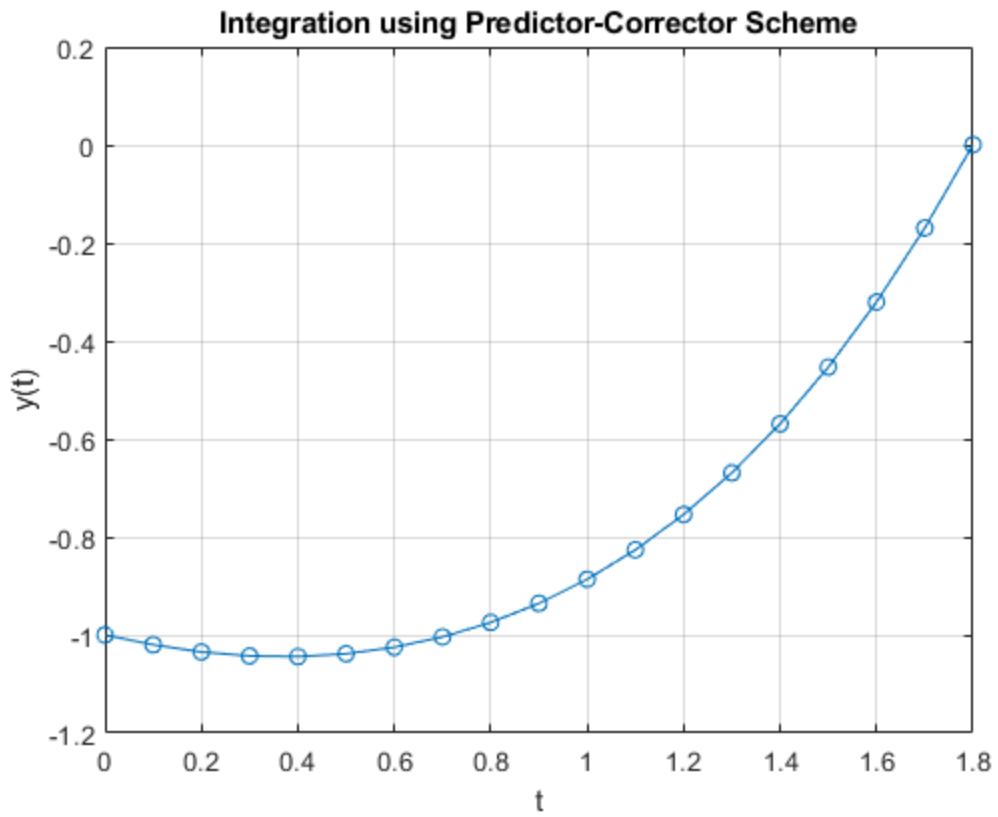
fprintf('The minimum value of y is approximately %.4f at t = %.1f\n',
    min_value, t_min);

    function dy = dydt(t, y, f_t, alpha)
        dy = y / (y * cos(t / 3) + alpha * f_t) + t;
    end

end

my TUID average: 5.56
The minimum value of y is approximately -1.0441 at t = 0.4

```



Published with MATLAB® R2023a