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1  # This code is to approximate the solution to the equation y'=3y by
2  # Adams fourth order predictor corrector methods
3
4  #a=start point, b=end point, N= no. of intervals, f is the solution to the\
5  # equation, h = step size, w0= starting value, w1=2nd value obtained from
6  # the analytic equation.
7  clear
8  clc
9  g=@(t) 50*exp(-3*t);
10 f=@(y) -3*y
11
12 a=0;b=10;N=100;h=(b-a)/N;
13 w0=50;w1=g(h);w(1)=w0;w(2)=w1;
14 T(1)=0;T(2)=h;
15 Exact(1)=g(0);Exact(2)=g(h);
16 for i=3:1:N
17     t=a+i*h;
18     T(i)=t;
19     Exact(end+1)=g(t);
20     W=w1+0.5*h*(3*f(w1)-f(w0));
21     W=w1+h*(5*f(W)+8*f(w1)-f(w0))/12;
22     w(end+1)=W;
23     w0=w1;
24     w1=W;
25 endfor
26 w(end)
27 Exact(end)
28 #plot of error
29 #plot(T,abs(1-w./Exact),'-r','linewidth',3)
30 plot(T,w,'-b','linewidth',3)
31 xlabel("t","FontSize",20)
32 ylabel("y(t)","FontSize",20)
33 title("Plot of y(t) vs t for h= 1/2 ","FontSize",25)
34 set(gca,'fontsize',20)

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