MATLAB highlighting in LaTeX documents

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1 MATLAB code demo

Euler method

```
1 % Euler method for the ODE model
 \frac{1}{2} % u'(x)=x^2+x-u, x in [0,1]
3 % Initial condition: u(0)=0;
 4 % Exact solution: u(x) = -exp(-x) + x^2 - x + 1.
 5 clear all; clf
 6 h=0.1;
 7 x=0:h:1;
                                   % function interval
 8 N=length(x)-1;
                                   % initial value
9 u(1)=0;
10 fun=@(t,u) t.^2+t-u;
                                  % RHS
12 for n=1:N
       u(n+1)=u(n)+h.*fun(x(n),u(n));
13
14 end
16 ue=-exp(-x)+x.^2-x+1;
                                   % exact solution
plot(x,ue,'b-',x,u,'r+','LineWidth',1)
18 legend('Exact ','Numerical','location','North')
19 %title('Euler method', 'fontsize', 12)
20 set(gca,'fontsize',12)
xlabel('x','fontsize', 16), ylabel('u','fontsize',16,'Rotation',0)
```