

# MATLAB highlighting in LaTeX documents

Liutao Tian  
andy123t@163.com

## 1 MATLAB code demo

Euler method

```
1 % Euler method for the ODE model
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;
8 N=length(x)-1;
9 u(1)=0; % initial value
10 fun=@(t,u) t.^2+t-u; % RHS
11
12 for n=1:N
13     u(n+1)=u(n)+h.*fun(x(n),u(n));
14 end
15
16 ue=-exp(-x)+x.^2-x+1; % exact solution
17 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)
21 xlabel('x', 'fontsize', 16), ylabel('u', 'fontsize',16, 'Rotation',0)
```