

# Code highlighting in LaTeX documents

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## 1 MATLAB code demo

Matlab Code

```
% Euler method for the ODE model
% u'(x)=x^2+x-u, x in [0,1]
% Initial condition: u(0)=0 ;
% Exact solution: u(x)=-exp(-x)+x^2-x+1.
clear all; clf
h=0.1;
x=0:h:1; % function interval
N=length(x)-1;
u(1)=0; % initial value
fun=@(t,u) t.^2+t-u; % RHS

for n=1:N
    u(n+1)=u(n)+h.*fun(x(n),u(n));
end

ue=-exp(-x)+x.^2-x+1; % exact solution
plot(x,ue,'b-',x,u,'r+', 'LineWidth',1)
legend('Exact ', 'Numerical', 'location', 'North')
%title('Euler method', 'fontsize',12)
set(gca, 'fontsize',12)
xlabel('x', 'fontsize', 16), ylabel('u', 'fontsize',16, 'Rotation',0)
```

## 2 Python code demo

Python Code

```
#PythonDraw.py
import turtle as t
t.setup(650, 350, 200, 200)
t.penup()
t.fd(-250)
t.pendown()
t.pensize(25)
t.pencolor("purple color")
t.seth(-40)
for i in range(4):
    t.circle(40, 80)
    t.circle(-40, 80)
t.circle(40, 80/2)
t.fd(40)
```

```
t.circle(16, 180)
t.fd(40 * 2/3)
t.done()
```

### 3 LaTeX code demo

#### LaTeX Code

```
% -*- coding: utf-8 -*-
\documentclass[11pt]{article} %book,report,letter
\usepackage{amsmath} %
\usepackage{mathrsfs} %
\usepackage[left=1.25in,right=1.25in,top=1in,bottom=1in]{geometry}

\begin{document}
\title{This is my Article}
\author{Andy}
\date{}
\maketitle

\begin{equation*}
\left\{
\begin{aligned}
&u_t = a_{xx} + f(x,t), 0 < x < 1, 0 < t \leq T, \\
&u(x,0) = \varphi(x), 0 \leq x \leq 1, \\
&u_x|_{x=0} = \alpha(t), u_x|_{x=1} = \beta(t), 0 < t < T.
\end{aligned}
\right.
\end{equation*}

\end{document}
```