

MATLAB and Python highlighting in LaTeX documents

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MATLAB Code

```
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; % function interval
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)
```

Python Code

```
1 #PythonDraw.py
2 import turtle as t
3 t.setup(650, 350, 200, 200)
4 t.penup()
5 t.fd(-250)
6 t.pendown()
7 t.pensize(25)
8 t.pencolor("purple color")
9 t.seth(-40)
10 for i in range(4):
11     t.circle(40, 80)
12     t.circle(-40, 80)
13 t.circle(40, 80/2)
14 t.fd(40)
15 t.circle(16, 180)
16 t.fd(40 * 2/3)
17 t.done()
```