

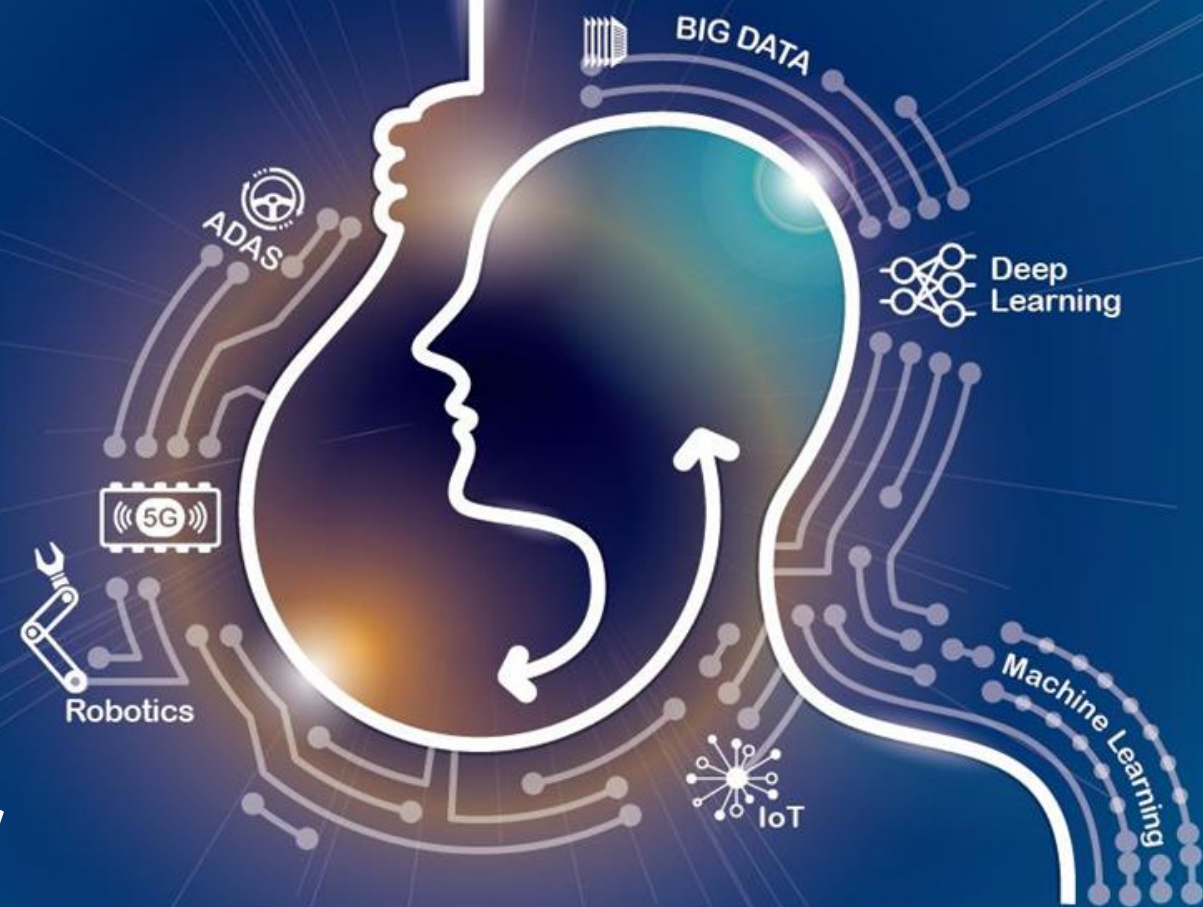
MATLAB® & SIMULINK®
Tech Forum & EXP

17th MATLAB & SIMULINK 技術高峰會

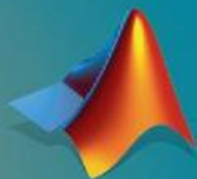
Oct 26, 2017

MATLAB Live Editor

Report by Pony Lai



Accelerating innovation
with MATLAB & Simulink



TeraSoft 鈦思科技
www.terasoft.com.tw

MathWorks
Accelerating the pace of engineering and science

Live Editor Features

- ♠ Single Interactive Environment
- ♠ Code Sections
- ♠ Output control
- ♠ Inline error message
- ♠ Formatted Text
- ♠ Equations, Image, and Hyperlinks
- ♠ Multilingual Text
- ♠ Sharing and Publication

♠ Single Interactive Environment

The screenshot displays the MATLAB Live Editor window. The top toolbar includes options for file operations (New, Open, Save), navigation (Find Files, Compare, Go To, Find), formatting (B, I, U, M, %, %*), insertion (Code, Text, Section Break, Hyperlink, Image), and text styling (Normal, Heading, Title). There are also 'Run All' and 'Run Section' buttons.

```

years = (1900:10:2000);
pop = [75.995 91.972 105.711 123.203 131.669 ...
       150.697 179.323 213.212 228.505 250.633 265.422]

pop = 1x11 double
       75.9950   91.9720  105.7110  123.2030  131.6690  150.6970  179.3230  213.2120  228.5050  250.6330  265.4220

plot(years,pop,'bo');
axis([1900 2020 50 300]);
title('Population of the U.S. 1900-2000');
ylabel('Millions');
xlabel('Year')
    
```

The plot, titled "Population of the U.S. 1900-2000", shows a scatter plot of population in millions over time. The x-axis is labeled "Year" and ranges from 1900 to 2020. The y-axis is labeled "Millions" and ranges from 50 to 300. The data points show a clear upward trend, starting at approximately 76 million in 1900 and reaching about 265 million by 2000.

Year	Population (Millions)
1900	75.995
1910	91.972
1920	105.711
1930	123.203
1940	131.669
1950	150.697
1960	179.323
1970	213.212
1980	228.505
1990	250.633
2000	265.422

♠ Code Sections

Live Editor - C:\MATLAB\Live Editor\US_Population.mlx

LIVE EDITOR **VIEW**

New Open Save Find Files Compare Go To Find Print Code Text Section Break Equation Hyperlink Image

Normal Heading Title Run All Run Section

```

years = (1900:10:2000);
pop = [75.995 91.972 105.711 123.203 131.669 ...
       150.697 179.323 213.212 228.505 250.633 265.422]

pop = 1x11 double
       75.9950   91.9720  105.7110  123.2030  131.6690  150.6970  179.3230  213.2120  228.5050  250.6330  265.4220

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Year	Population (Millions)
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1950	150.697
1960	179.323
1970	213.212
1980	228.505
1990	250.633
2000	265.422

♠ Output control

The screenshot shows the MATLAB Live Editor interface. The code editor contains the following code:

```
years = (1900:10:2000);
pop = [75.995 91.972 105.711 123.203 131.669 ...
       150.697 179.323 213.212 228.505 250.633 265.422];
plot(years,pop,'bo');
axis([1900 2020 50 300]);
title('Population of the U.S. 1900-2000');
ylabel('Millions');
xlabel('Year')

x = (years - 1900)/50 ;
coef1 = polyfit(x,pop,1)
coef2 = polyfit(x,pop,2)
coef3 = polyfit(x,pop,3)
```

The plot area displays a scatter plot titled "Population of the U.S. 1900-2000" showing population in millions over time. The x-axis is labeled "Year" and ranges from 1900 to 2020. The y-axis is labeled "Millions" and ranges from 50 to 300. The plot shows a clear upward trend with blue circular markers.

The command window shows the following output:

```
pop = 1x11 double
    75.9950    91.9720   105.7110   123.2030 ...

coef1 = 1x2 double
    98.9924    66.1296
coef2 = 1x3 double
    15.1014    68.7896    75.1984
coef3 = 1x4 double
   -17.1908    66.6739    29.4569    80.1414
```

The screenshot shows the MATLAB Live Editor interface with a scroll bar on the right. The code editor contains the following code:

```
years = (1900:10:2000);
pop = [75.995 91.972 105.711 123.203 131.669 ...
       150.697 179.323 213.212 228.505 250.633 265.422];

pop = 1x11 double
    75.9950    91.9720   105.7110   123.2030   131.6690   150.6970
    179.3230   213.2120   228.5050   250.6330   265.4220

plot(years,pop,'bo');
axis([1900 2020 50 300]);
title('Population of the U.S. 1900-2000');
ylabel('Millions');
xlabel('Year')
```

The plot area displays a scatter plot titled "Population of the U.S. 1900-2000" showing population in millions over time. The x-axis is labeled "Year" and ranges from 1900 to 2020. The y-axis is labeled "Millions" and ranges from 50 to 300. The plot shows a clear upward trend with blue circular markers.

♠ Inline error message

The screenshot shows the MATLAB Live Editor interface. The code window on the left contains the following code:

```

years = (1900:10:2000);
pop = [75.995 91.972 105.711 123.203 131.669 ...
       150.697 179.323 213.212 228.505 250.633 265.422];
plot(years,pop,'bo');
axis([1900 2020 50 300]);
title('Population of the U.S. 1900-2000');
ylabel('Millions');
xlabel('Year')

x = (years - 1900)/50 ;
coef1 = plyfit(x,pop,1)
coef2 = polyfit(x,pop,2)
coef3 = polyfit(x,pop,3)
    
```

The plot window on the right displays a scatter plot of US population in millions from 1900 to 2000. The x-axis is labeled 'Year' and ranges from 1900 to 2020. The y-axis is labeled 'Millions' and ranges from 50 to 250. The data points are blue circles showing an upward trend.

An error message is displayed in the bottom right of the code window:

```

Undefined function 'plyfit' for input arguments of type 'double'.
    
```

♠ Formatted Text

The screenshot shows the MATLAB Live Editor window titled "Live Editor - C:\MATLAB\Live Editor\US_Population.mlx". The interface includes a ribbon with tabs for "LIVE EDITOR" and "VIEW". The "VIEW" tab is active, showing a rich text editor with various formatting options like bold, italic, underline, and text styles (Normal, Heading, Title). The document content is as follows:

Predicting the US Population

In this example, we will use census data from 1900 to 2000 to try to predict the US Population in 2010. We will use fit the data using polynomials of different order to do our prediction.

Visualize the Census Data

```
years = (1900:10:2000);
pop = [75.995 91.972 105.711 123.203 131.669 ...
       150.697 179.323 213.212 228.505 250.633 265.422]
```

```
pop = 1x11 double
       75.9950  91.9720 105.7110 123.2030 131.6690 150.6970 179.3230 213.2120 228.5050 250.6330 265.4220
```

```
plot(years,pop,'bo');
axis([1900 2020 50 300]);
title('Population of the U.S. 1900-2000');
ylabel('Millions');
xlabel('Year')
```

Population of the U.S. 1900-2000

300

♠ Equations, Image, and Hyperlinks

Live Editor - C:\MATLAB\Live Editor\US_Population.mlx


VIEW

FILE NAVIGATE FORMAT INSERT TEXT STYLE RUN

50
1900 1920 1940 1960 1980 2000 2020
Year

Predicting the Population

Population is affected by four factors -- birth rate, death rate and the rates of immigration and emigration.



Try fitting the data with a linear, quadratic and cubic equation. Use the MATLAB `polyfit` function to get the coefficients. The equations are

$$y = ax + b$$

$$y = ax^2 + bx + c$$

$$y = ax^3 + bx^2 + cx + d$$

`x = (years - 1900)/50 ;`
`coeff = polyfit(x, pop, 1)`

Live Editor - C:\MATLAB\Live Editor\US_Population.mlx

VIEW

FILE NAVIGATE FORMAT INSERT TEXT STYLE RUN

50
1900 1920 1940 1960 1980 2000 2020
Year

Predicting the Population

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`x = (years - 1900)/50 ;`
`coeff = polyfit(x, pop, 1)`

Edit Equation

Enter LaTeX equation code:

```
\begin{array}{l}
y = ax + b \\
y = ax^2 + bx + c \\
y = ax^3 + bx^2 + cx + d
\end{array}
```

Preview:

$$y = ax + b$$

$$y = ax^2 + bx + c$$

$$y = ax^3 + bx^2 + cx + d$$

OK Cancel Help

♠ Multilingual Text

Live Editor - C:\MATLAB\Live Editor\US_Population.mlx *

LIVE EDITOR VIEW

+ New Open Save Find Files Compare Go To Find **B I U M** Code Text Section Break Image Equation Hyperlink AaBbCc AaBbCc AaBbCc Run All Run Section


FILE NAVIGATE FORMAT INSERT TEXT STYLE RUN

50
 1900 1920 1940 1960 1980 2000 2020
 Year

Predicting the Population

Live Editor を使えば、英語以外の言語でも分析結果を記述できます。

Population is affected by four factors -- birth rate, death rate and the rates of immigration and emigration.



Try fitting the data with a linear, quadratic and cubic equation. Use the MATLAB `polyfit` function to get the coefficients. The equations are

$$y = ax + b$$

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♠ Sharing and Publication

Predicting the Population

Live Editorを使えば、英語以外の言語でも分析結果を記述できます。

Predicting the US Population

Use census data from 1900 to 2000 to try to predict the US Population in 2010. Fit the data with polynomials of different order to do the prediction.

Visualize the Census Data

```
years = (1900:10:2000);
pop = [75.995 91.972 105.711 123.203 131.669 ...
       150.697 179.323 213.212 228.505 250.633 265.422]
```

```
pop = 1x11 double
       75.9950  91.9720 105.7110 123.2030 131.6690 150.6970 179.3230 213.2120 ...
```

```
plot(years,pop,'bo');
axis([1900 2020 50 300]);
title('Population of the U.S. 1900-2000');
ylabel('Millions');
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```



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