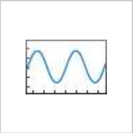
plot

2-D line plot



Syntax

```
plot(X,Y)
plot(X,Y,LineSpec)
plot(X1,Y1,...,Xn,Yn)
plot(X1,Y1,LineSpec1,...,Xn,Yn,LineSpecn)
plot(Y)
plot(Y,LineSpec)

plot(tbl,xvar,yvar)
plot(tbl,yvar)

plot(ax,___)
plot(___,Name,Value)
p = plot(___)
```

Description

Vector and Matrix Data

`plot(X,Y)` creates a 2-D line plot of the data in `Y` versus the corresponding values in `X`. example

- To plot a set of coordinates connected by line segments, specify `X` and `Y` as vectors of the same length.
- To plot multiple sets of coordinates on the same set of axes, specify at least one of `X` or `Y` as a matrix.

`plot(X,Y,LineSpec)` creates the plot using the specified line style, marker, and color.

`plot(X1,Y1,...,Xn,Yn)` plots multiple pairs of x- and y-coordinates on the same set of axes. Use this syntax as an alternative to specifying coordinates as matrices. example

`plot(X1,Y1,LineSpec1,...,Xn,Yn,LineSpecn)` assigns specific line styles, markers, and colors to each x-y pair. You can specify `LineSpec` for some x-y pairs and omit it for others. For example, `plot(X1,Y1,"o",X2,Y2)` specifies markers for the first x-y pair but not for the second pair. example

`plot(Y)` plots `Y` against an implicit set of x-coordinates. example

- If `Y` is a vector, the x-coordinates range from 1 to `length(Y)`.
- If `Y` is a matrix, the plot contains one line for each column in `Y`. The x-coordinates range from 1 to the number of rows in `Y`.

If `Y` contains complex numbers, MATLAB® plots the imaginary part of `Y` versus the real part of `Y`. If you specify both `X` and `Y`, the imaginary part is ignored.

`plot(Y,LineSpec)` plots `Y` using implicit x-coordinates, and specifies the line style, marker, and color.

Table Data

`plot(tbl,xvar,yvar)` plots the variables `xvar` and `yvar` from the table `tbl`. To plot one data set, specify one variable for `xvar` and one variable for `yvar`. To plot multiple data sets, specify multiple variables for `xvar`, `yvar`, or both. If both arguments specify multiple variables, they must specify the same number of variables. *(since R2022a)*

`plot(tbl,yvar)` plots the specified variable from the table against the row indices of the table. If the table is a timetable, the specified variable is plotted against the row times of the timetable. *(since R2022a)* example

Additional Options

`plot(ax,___)` displays the plot in the target axes. Specify the axes as the first argument in any of the previous syntaxes. example

`plot(___,Name,Value)` specifies `Line` properties using one or more name-value arguments. The properties apply to all the plotted lines. Specify the name-value arguments after all the arguments in any of the previous syntaxes. For a list of properties, see Line Properties. example

`p = plot(___)` returns a `Line` object or an array of `Line` objects. Use `p` to modify properties of the plot after creating it. For a list of properties, see Line Properties. example

Examples

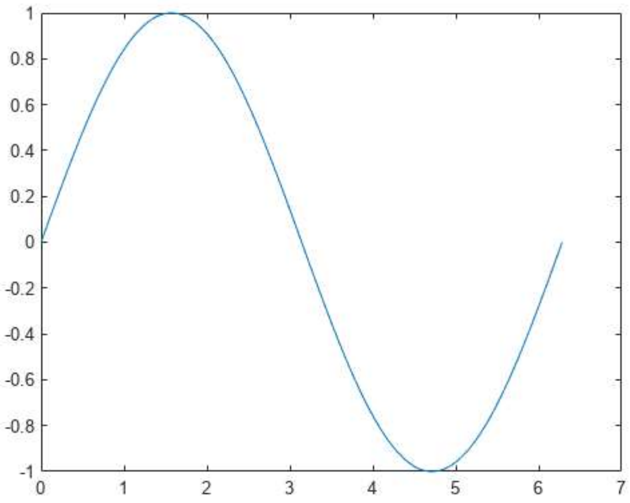
collapse all

Create Line Plot

Create `x` as a vector of linearly spaced values between 0 and 2π. Use an increment of $\pi/100$ between the values. Create `y` as sine values of `x`. Create a line plot of the data.

Open Live Script

```
x = 0:pi/100:2*pi;
y = sin(x);
plot(x,y)
```



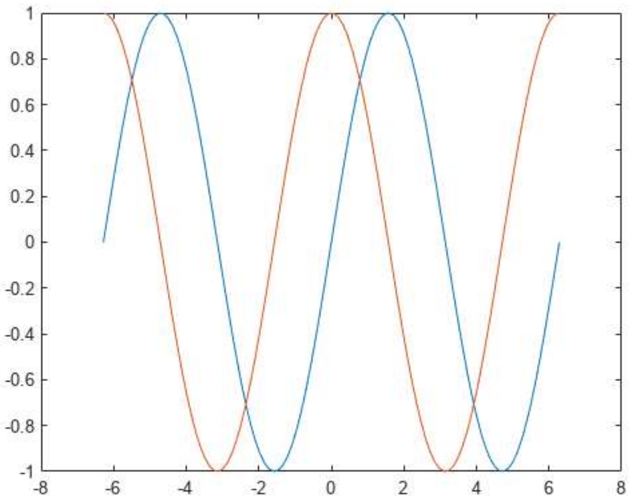
Plot Multiple Lines

Define x as 100 linearly spaced values between -2π and 2π. Define y1 and y2 as sine and cosine values of x. Create a line plot of both sets of data.

Open Live Script

```
x = linspace(-2*pi,2*pi);
y1 = sin(x);
y2 = cos(x);

figure
plot(x,y1,x,y2)
```



Create Line Plot From Matrix

Define Y as the 4-by-4 matrix returned by the `magic` function.

Open Live Script

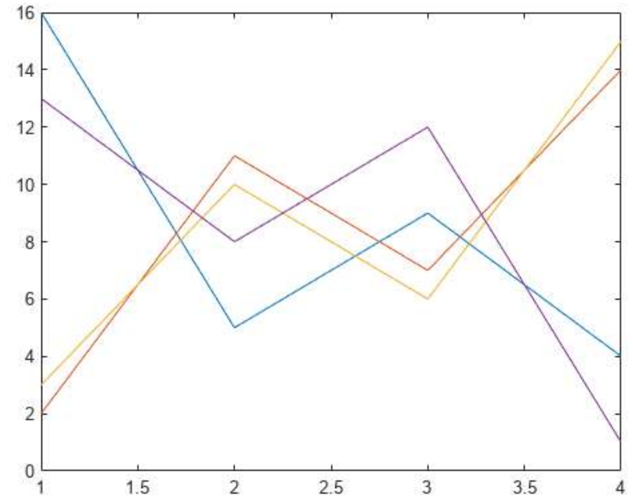
```
Y = magic(4)
```

```
Y = 4×4

    16     2     3    13
     5    11    10     8
     9     7     6    12
     4    14    15     1
```

Create a 2-D line plot of Y. MATLAB® plots each matrix column as a separate line.

```
figure
plot(Y)
```



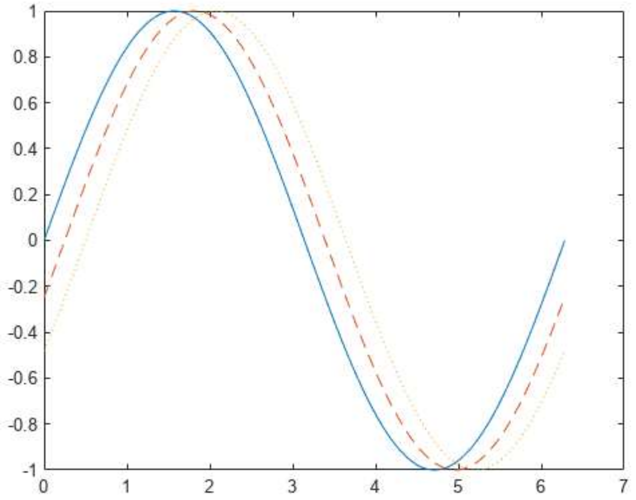
Specify Line Style

Plot three sine curves with a small phase shift between each line. Use the default line style for the first line. Specify a dashed line style for the second line and a dotted line style for the third line.

Open Live Script

```
x = 0:pi/100:2*pi;
y1 = sin(x);
y2 = sin(x-0.25);
y3 = sin(x-0.5);

figure
plot(x,y1,x,y2,'--',x,y3,':')
```



MATLAB® cycles the line color through the default color order.

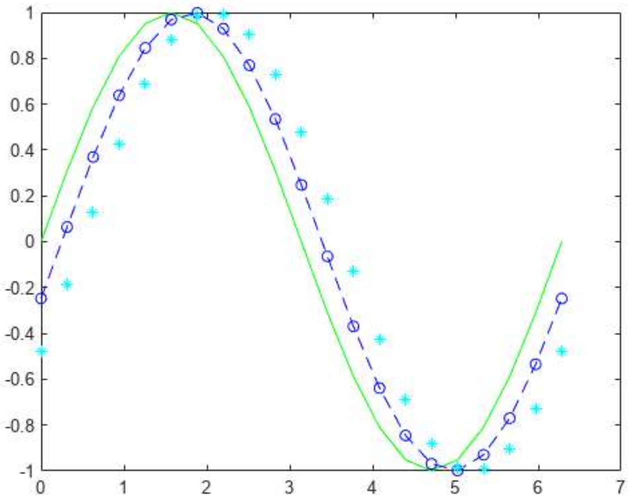
Specify Line Style, Color, and Marker

Plot three sine curves with a small phase shift between each line. Use a green line with no markers for the first sine curve. Use a blue dashed line with circle markers for the second sine curve. Use only cyan star markers for the third sine curve.

Open Live Script

```
x = 0:pi/10:2*pi;
y1 = sin(x);
y2 = sin(x-0.25);
y3 = sin(x-0.5);

figure
plot(x,y1,'g',x,y2,'b--o',x,y3,'c*')
```

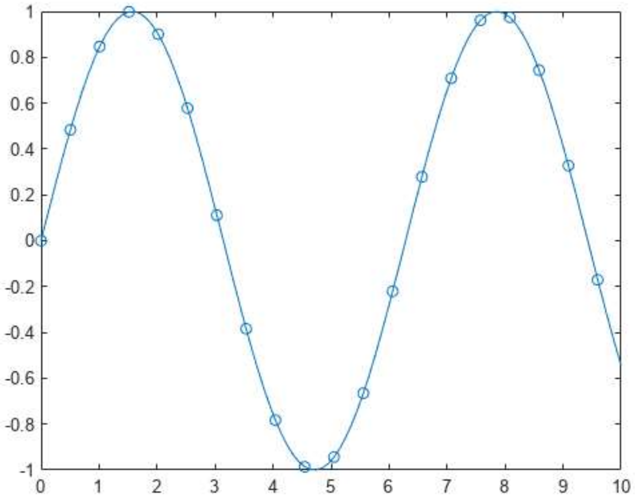


Display Markers at Specific Data Points

Create a line plot and display markers at every fifth data point by specifying a marker symbol and setting the `MarkerIndices` property as a name-value pair.

Open Live Script

```
x = linspace(0,10);
y = sin(x);
plot(x,y,'-o','MarkerIndices',1:5:length(y))
```



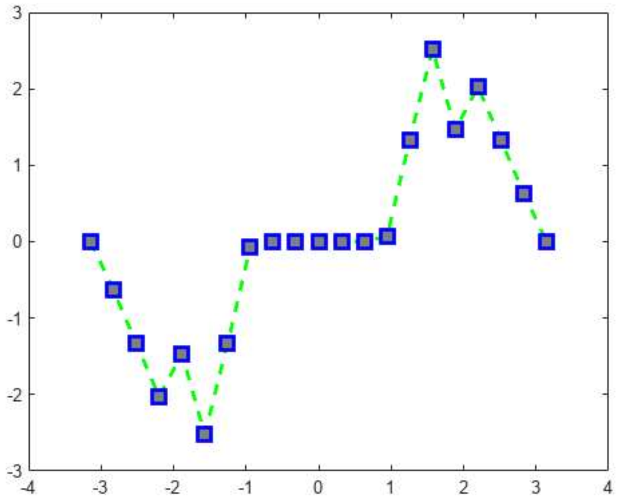
Specify Line Width, Marker Size, and Marker Color

Create a line plot and use the `LineSpec` option to specify a dashed green line with square markers. Use `Name,Value` pairs to specify the line width, marker size, and marker colors. Set the marker edge color to blue and set the marker face color using an RGB color value.

Open Live Script

```
x = -pi:pi/10:pi;
y = tan(sin(x)) - sin(tan(x));

figure
plot(x,y,'--gs',...
    'LineWidth',2,...
    'MarkerSize',10,...
    'MarkerEdgeColor','b',...
    'MarkerFaceColor',[0.5,0.5,0.5])
```



Add Title and Axis Labels

Use the `linspace` function to define `x` as a vector of 150 values between 0 and 10. Define `y` as cosine values of `x`.

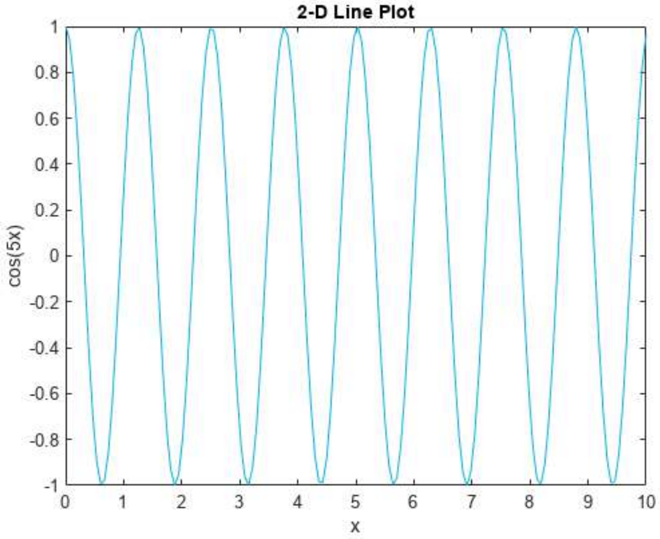
Open Live Script

```
x = linspace(0,10,150);
y = cos(5*x);
```

Create a 2-D line plot of the cosine curve. Change the line color to a shade of blue-green using an RGB color value. Add a title and axis labels to the graph using the `title`, `xlabel`, and `ylabel` functions.

```
figure
plot(x,y,'Color',[0,0.7,0.9])

title('2-D Line Plot')
xlabel('x')
ylabel('cos(5x)')
```



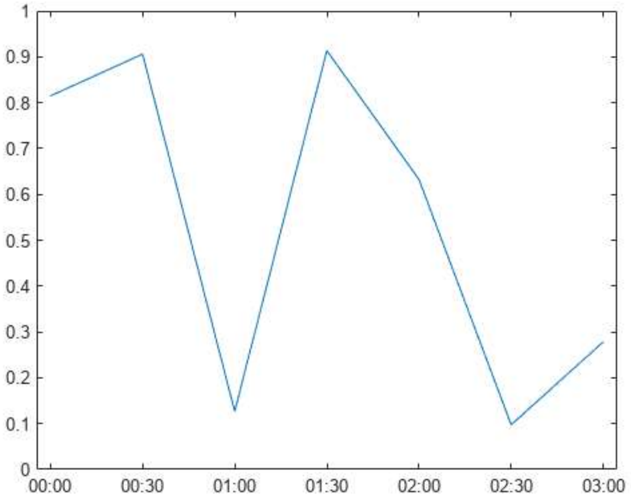
Plot Durations and Specify Tick Format

Define `t` as seven linearly spaced `duration` values between 0 and 3 minutes. Plot random data and specify the format of the `duration` tick marks using the `'DurationTickFormat'` name-value pair argument.

Open Live Script

```
t = 0:seconds(30):minutes(3);
y = rand(1,7);

plot(t,y,'DurationTickFormat','mm:ss')
```



Plot Coordinates from a Table

Since R2022a

Open Live Script

A convenient way to plot data from a table is to pass the table to the `plot` function and specify the variables to plot.

Read `weather.csv` as a timetable `tbl`. Then display the first three rows of the table.

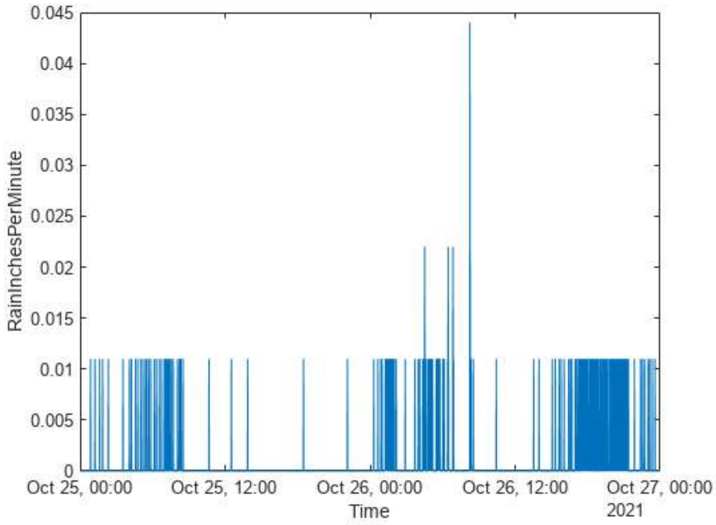
```
tbl = readtimetable("weather.csv");
tbl = sortrows(tbl);
head(tbl,3)
```

```
         Time             WindDirection    WindSpeed    Humidity    Temperature    RainInchesPerMinute    CumulativeRainfall    PressureHg    Powe
    ____________________    _____________    _________    ________    ___________    ___________________    __________________    __________    ____

    25-Oct-2021 00:00:09         46              1           84          49.2                 0                     0               29.96        4
    25-Oct-2021 00:01:09         45            1.6           84          49.2                 0                     0               29.96       4.
    25-Oct-2021 00:02:09         36            2.2           84          49.2                 0                     0               29.96       4.
```

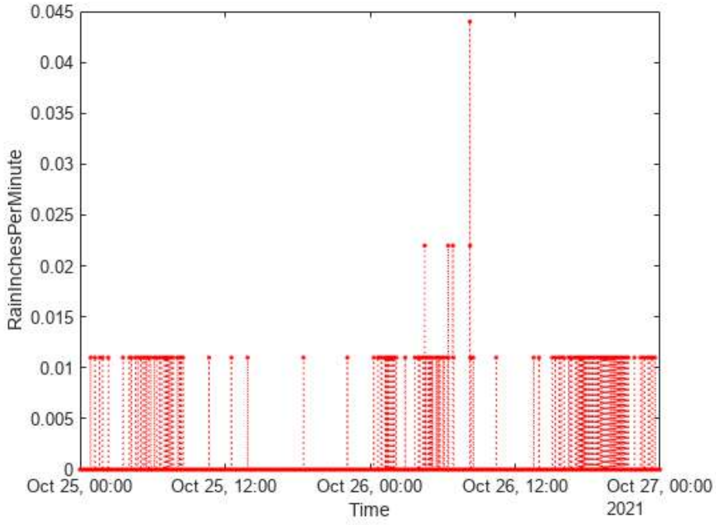
Plot the row times on the *x*-axis and the `RainInchesPerMinute` variable on the *y*-axis. When you plot data from a timetable, the row times are plotted on the *x*-axis by default. Thus, you do not need to specify the `Time` variable. Return the `Line` object as `p`. Notice that the axis labels match the variable names.

```
p = plot(tbl,"RainInchesPerMinute");
```



To modify aspects of the line, set the `LineStyle`, `Color`, and `Marker` properties on the `Line` object. For example, change the line to a red dotted line with point markers.

```
p.LineStyle = ":";
p.Color = "red";
p.Marker = ".";
```



Plot Multiple Table Variables on One Axis

Since R2022a

Open Live Script

Read `weather.csv` as a timetable `tbl`, and display the first few rows of the table.

```
tbl = readtimetable("weather.csv");
head(tbl,3)
```

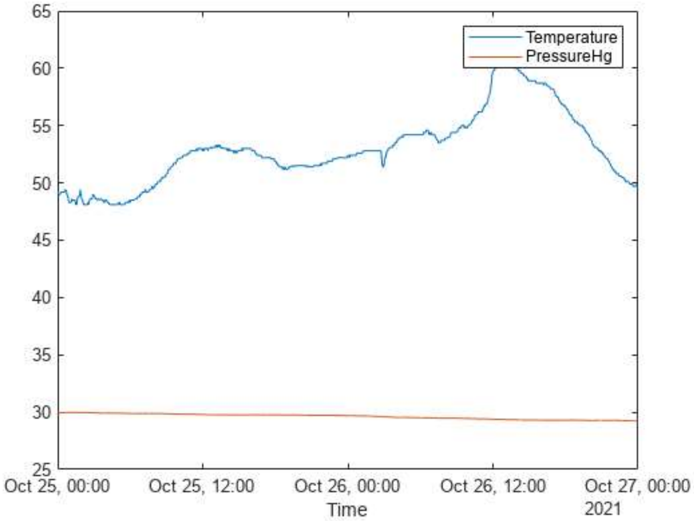
```
         Time             WindDirection    WindSpeed    Humidity    Temperature    RainInchesPerMinute    CumulativeRainfall    PressureHg    Powe
    ____________________    _____________    _________    ________    ___________    ___________________    __________________    __________    ____

    25-Oct-2021 00:00:09         46              1           84          49.2                 0                     0               29.96          4
    25-Oct-2021 00:01:09         45            1.6           84          49.2                 0                     0               29.96         4.
    25-Oct-2021 00:02:09         36            2.2           84          49.2                 0                     0               29.96         4.
```

Plot the row times on the *x*-axis and the `Temperature` and `PressureHg` variables on the *y*-axis. When you plot data from a timetable, the row times are plotted on the *x*-axis by default. Thus, you do not need to specify the `Time` variable.

Add a legend. Notice that the legend labels match the variable names.

```
plot(tbl,["Temperature" "PressureHg"])
legend
```



Specify Axes for Line Plot

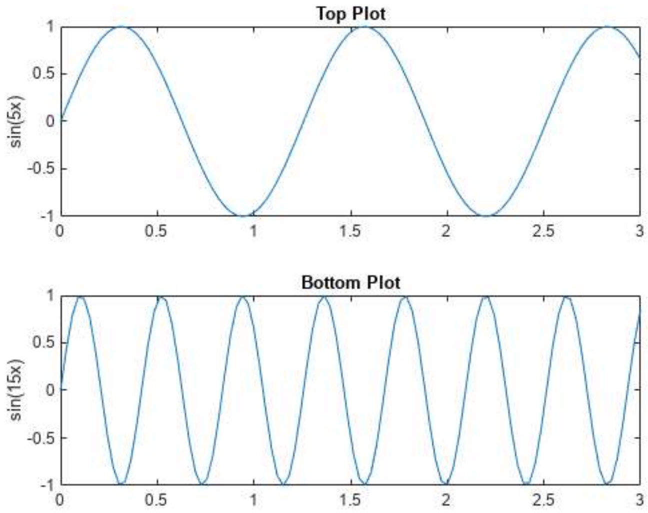
Starting in R2019b, you can display a tiling of plots using the `tiledlayout` and `nexttile` functions. Call the `tiledlayout` function to create a 2-by-1 tiled chart layout. Call the `nexttile` function to create an axes object and return the object as `ax1`. Create the top plot by passing `ax1` to the `plot` function. Add a title and *y*-axis label to the plot by passing the axes to the `title` and `ylabel` functions. Repeat the process to create the bottom plot.

Open Live Script

```
% Create data and 2-by-1 tiled chart layout
x = linspace(0,3);
y1 = sin(5*x);
y2 = sin(15*x);
tiledlayout(2,1)

% Top plot
ax1 = nexttile;
plot(ax1,x,y1)
title(ax1,'Top Plot')
ylabel(ax1,'sin(5x)')

% Bottom plot
ax2 = nexttile;
plot(ax2,x,y2)
title(ax2,'Bottom Plot')
ylabel(ax2,'sin(15x)')
```

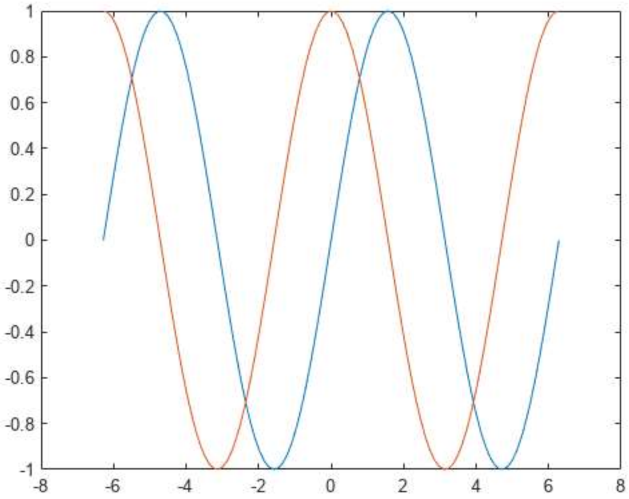


Modify Lines After Creation

Define x as 100 linearly spaced values between -2π and 2π. Define y1 and y2 as sine and cosine values of x. Create a line plot of both sets of data and return the two chart lines in p.

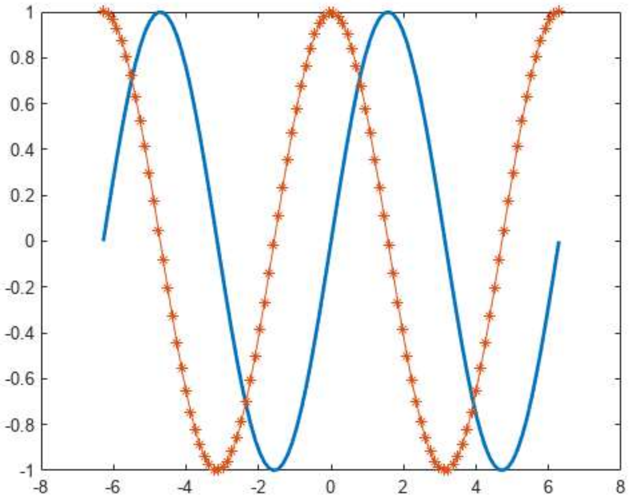
Open Live Script

```
x = linspace(-2*pi,2*pi);
y1 = sin(x);
y2 = cos(x);
p = plot(x,y1,x,y2);
```



Change the line width of the first line to 2. Add star markers to the second line. Use dot notation to set properties.

```
p(1).LineWidth = 2;
p(2).Marker = '*';
```



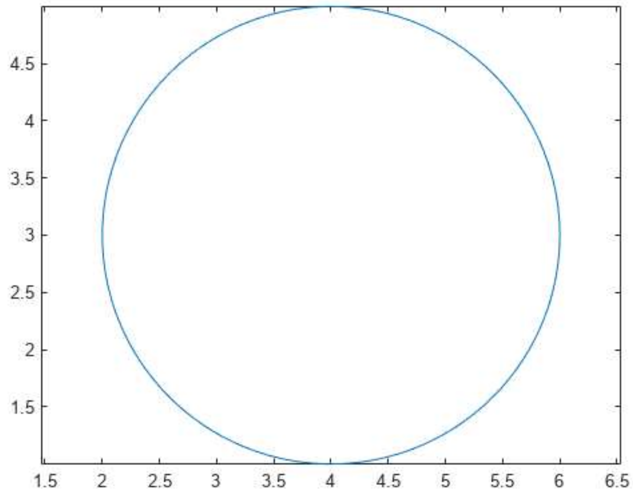
Plot Circle

Plot a circle centered at the point (4,3) with a radius equal to 2. Use `axis equal` to use equal data units along each coordinate direction.

Open Live Script

```
r = 2;
xc = 4;
yc = 3;

theta = linspace(0,2*pi);
x = r*cos(theta) + xc;
y = r*sin(theta) + yc;
plot(x,y)
axis equal
```



Input Arguments

collapse all

X — *x*-coordinates
scalar | vector | matrix

x-coordinates, specified as a scalar, vector, or matrix. The size and shape of `X` depends on the shape of your data and the type of plot you want to create. This table describes the most common situations.

Type of Plot	How to Specify Coordinates
Single point	Specify `X` and `Y` as scalars and include a marker. For example: `plot(1,2,"o")`
One set of points	Specify `X` and `Y` as any combination of row or column vectors of the same length. For example: `plot([1 2 3],[4; 5; 6])`
Multiple sets of points (using vectors)	Specify consecutive pairs of `X` and `Y` vectors. For example: `plot([1 2 3],[4 5 6],[1 2 3],[7 8 9])`

Multiple sets of points
(using matrices)
	If all the sets share the same *x*- or *y*-coordinates, specify the shared coordinates as a vector and the other coordinates as a matrix. The length of the vector must match one of the dimensions of the matrix. For example:
	`plot([1 2 3],[4 5 6; 7 8 9])`
	If the matrix is square, MATLAB plots one line for each column in the matrix.
	Alternatively, specify `X` and `Y` as matrices of equal size. In this case, MATLAB plots each column of `Y` against the corresponding column of `X`. For example:
	`plot([1 2 3; 4 5 6],[7 8 9; 10 11 12])`

Data Types: `single` | `double` | `int8` | `int16` | `int32` | `int64` | `uint8` | `uint16` | `uint32` | `uint64` | `categorical` | `datetime` | `duration`

`Y` — *y*-coordinates

scalar | vector | matrix

y-coordinates, specified as a scalar, vector, or matrix. The size and shape of `Y` depends on the shape of your data and the type of plot you want to create. This table describes the most common situations.

Type of Plot	How to Specify Coordinates
Single point	Specify `X` and `Y` as scalars and include a marker. For example: `plot(1,2,"o")`

One set of points	Specify `X` and `Y` as any combination of row or column vectors of the same length. For example:
	`plot([1 2 3],[4; 5; 6])`
	Alternatively, specify just the *y*-coordinates. For example:
	`plot([4 5 6])`

Multiple sets of points (using vectors)	Specify consecutive pairs of `X` and `Y` vectors. For example: `plot([1 2 3],[4 5 6],[1 2 3],[7 8 9])`

Multiple sets of points
(using matrices)
	If all the sets share the same *x*- or *y*-coordinates, specify the shared coordinates as a vector and the other coordinates as a matrix. The length of the vector must match one of the dimensions of the matrix. For example:
	`plot([1 2 3],[4 5 6; 7 8 9])`
	If the matrix is square, MATLAB plots one line for each column in the matrix.
	Alternatively, specify `X` and `Y` as matrices of equal size. In this case, MATLAB plots each column of `Y` against the corresponding column of `X`. For example:
	`plot([1 2 3; 4 5 6],[7 8 9; 10 11 12])`

Data Types: `single` | `double` | `int8` | `int16` | `int32` | `int64` | `uint8` | `uint16` | `uint32` | `uint64` | `categorical` | `datetime` | `duration`

`LineSpec` — Line style, marker, and color

string scalar | character vector

Line style, marker, and color, specified as a string scalar or character vector containing symbols. The symbols can appear in any order. You do not need to specify all three characteristics (line style, marker, and color). For example, if you omit the line style and specify the marker, then the plot shows only the marker and no line.

Example: `"--or"` is a red dashed line with circle markers.

Line Style	Description	Resulting Line
`"-"`	Solid line	———
`"--"`	Dashed line	- - - - -
`":"`	Dotted line	···········
`"-."`	Dash-dotted line	-·-·-·-

Marker	Description	Resulting Marker
`"o"`	Circle	○
`"+"`	Plus sign	+
`"*"`	Asterisk	✳
`"."`	Point	•
`"x"`	Cross	×
`"_"`	Horizontal line	—
`"|"`	Vertical line	|
`"square"`	Square	□
`"diamond"`	Diamond	◇
`"^"`	Upward-pointing triangle	△
`"v"`	Downward-pointing triangle	▽
`">"`	Right-pointing triangle	▷
`"<"`	Left-pointing triangle	◁
`"pentagram"`	Pentagram	☆
`"hexagram"`	Hexagram	✡

Color Name	Short Name	RGB Triplet	Appearance
`"red"`	`"r"`	`[1 0 0]`	🟥
`"green"`	`"g"`	`[0 1 0]`	🟩
`"blue"`	`"b"`	`[0 0 1]`	🟦
`"cyan"`	`"c"`	`[0 1 1]`	🟦
`"magenta"`	`"m"`	`[1 0 1]`	🟪

Color Name	Short Name	RGB Triplet	Appearance
`"yellow"`	`"y"`	`[1 1 0]`	🟨
`"black"`	`"k"`	`[0 0 0]`	⬛
`"white"`	`"w"`	`[1 1 1]`	⬜

`tbl` — Source table

table | timetable

Source table containing the data to plot, specified as a table or a timetable.

`xvar` — Table variables containing x-coordinates

string array | character vector | cell array | pattern | numeric scalar or vector | logical vector | `vartype()`

Table variables containing the x-coordinates, specified using one of the indexing schemes from the table.

Indexing Scheme	Examples
Variable names: • A string, character vector, or cell array. • A `pattern` object.	• `"A"` or `'A'` — A variable named `A` • `["A","B"]` or `{'A','B'}` — Two variables named `A` and `B` • `"Var"+digitsPattern(1)` — Variables named `"Var"` followed by a single digit
Variable index: • An index number that refers to the location of a variable in the table. • A vector of numbers. • A logical vector. Typically, this vector is the same length as the number of variables, but you can omit trailing `0` or `false` values.	• `3` — The third variable from the table • `[2 3]` — The second and third variables from the table • `[false false true]` — The third variable
Variable type: • A `vartype` subscript that selects variables of a specified type.	• `vartype("categorical")` — All the variables containing categorical values

The table variables you specify can contain numeric, categorical, datetime, or duration values. If `xvar` and `yvar` both specify multiple variables, the number of variables must be the same.

Example: `plot(tbl,["x1","x2"],"y")` specifies the table variables named `x1` and `x2` for the x-coordinates.

Example: `plot(tbl,2,"y")` specifies the second variable for the x-coordinates.

Example: `plot(tbl,vartype("numeric"),"y")` specifies all numeric variables for the x-coordinates.

`yvar` — Table variables containing y-coordinates

string array | character vector | cell array | pattern | numeric scalar or vector | logical vector | `vartype()`

Table variables containing the y-coordinates, specified using one of the indexing schemes from the table.

Indexing Scheme	Examples
Variable names: • A string, character vector, or cell array. • A `pattern` object.	• `"A"` or `'A'` — A variable named `A` • `["A","B"]` or `{'A','B'}` — Two variables named `A` and `B` • `"Var"+digitsPattern(1)` — Variables named `"Var"` followed by a single digit
Variable index: • An index number that refers to the location of a variable in the table. • A vector of numbers. • A logical vector. Typically, this vector is the same length as the number of variables, but you can omit trailing `0` or `false` values.	• `3` — The third variable from the table • `[2 3]` — The second and third variables from the table • `[false false true]` — The third variable
Variable type: • A `vartype` subscript that selects variables of a specified type.	• `vartype("categorical")` — All the variables containing categorical values

The table variables you specify can contain numeric, categorical, datetime, or duration values. If `xvar` and `yvar` both specify multiple variables, the number of variables must be the same.

Example: `plot(tbl,"x",["y1","y2"])` specifies the table variables named `y1` and `y2` for the *y*-coordinates.

Example: `plot(tbl,"x",2)` specifies the second variable for the *y*-coordinates.

Example: `plot(tbl,"x",vartype("numeric"))` specifies all numeric variables for the *y*-coordinates.

`ax` — Target axes

`Axes` object | `PolarAxes` object | `GeographicAxes` object

Target axes, specified as an `Axes` object, a `PolarAxes` object, or a `GeographicAxes` object. If you do not specify the axes, MATLAB plots into the current axes or it creates an `Axes` object if one does not exist.

To create a polar plot or geographic plot, specify `ax` as a `PolarAxes` or `GeographicAxes` object. Alternatively, call the `polarplot` or `geoplot` function.

Name-Value Arguments

Specify optional pairs of arguments as `Name1=Value1,...,NameN=ValueN`, where `Name` is the argument name and `Value` is the corresponding value. Name-value arguments must appear after other arguments, but the order of the pairs does not matter.

Example: `plot([0 1],[2 3],LineWidth=2)`

Before R2021a, use commas to separate each name and value, and enclose `Name` *in quotes.*

Example: `plot([0 1],[2 3],"LineWidth",2)`

Note

The properties listed here are only a subset. For a complete list, see Line Properties.

`Color` — Line color

`[0 0.4470 0.7410]` (default) | RGB triplet | hexadecimal color code | `"r"` | `"g"` | `"b"` | ...

Line color, specified as an RGB triplet, a hexadecimal color code, a color name, or a short name.

For a custom color, specify an RGB triplet or a hexadecimal color code.

- An RGB triplet is a three-element row vector whose elements specify the intensities of the red, green, and blue components of the color. The intensities must be in the range `[0,1]`, for example, `[0.4 0.6 0.7]`.
- A hexadecimal color code is a string scalar or character vector that starts with a hash symbol (`#`) followed by three or six hexadecimal digits, which can range from `0` to `F`. The values are not case sensitive. Therefore, the color codes `"#FF8800"`, `"#ff8800"`, `"#F80"`, and `"#f80"` are equivalent.

Alternatively, you can specify some common colors by name. This table lists the named color options, the equivalent RGB triplets, and hexadecimal color codes.

Color Name	Short Name	RGB Triplet	Hexadecimal Color Code	Appearance
`"red"`	`"r"`	`[1 0 0]`	`"#FF0000"`	🟥
`"green"`	`"g"`	`[0 1 0]`	`"#00FF00"`	🟩
`"blue"`	`"b"`	`[0 0 1]`	`"#0000FF"`	🟦
`"cyan"`	`"c"`	`[0 1 1]`	`"#00FFFF"`	🟦
`"magenta"`	`"m"`	`[1 0 1]`	`"#FF00FF"`	🟪
`"yellow"`	`"y"`	`[1 1 0]`	`"#FFFF00"`	🟨
`"black"`	`"k"`	`[0 0 0]`	`"#000000"`	⬛
`"white"`	`"w"`	`[1 1 1]`	`"#FFFFFF"`	⬜
`"none"`	Not applicable	Not applicable	Not applicable	No color

Here are the RGB triplets and hexadecimal color codes for the default colors MATLAB uses in many types of plots.

RGB Triplet	Hexadecimal Color Code	Appearance
`[0 0.4470 0.7410]`	`"#0072BD"`	🟦

RGB Triplet	Hexadecimal Color Code	Appearance
`[0.8500 0.3250 0.0980]`	`"#D95319"`	🟧
`[0.9290 0.6940 0.1250]`	`"#EDB120"`	🟨
`[0.4940 0.1840 0.5560]`	`"#7E2F8E"`	🟪
`[0.4660 0.6740 0.1880]`	`"#77AC30"`	🟩
`[0.3010 0.7450 0.9330]`	`"#4DBEEE"`	🟦
`[0.6350 0.0780 0.1840]`	`"#A2142F"`	🟥

Example: `"blue"`

Example: `[0 0 1]`

Example: `"#0000FF"`

`LineStyle` — Line style

`"-"` (default) | `"--"` | `":"` | `"-."` | `"none"`

Line style, specified as one of the options listed in this table.

Line Style	Description	Resulting Line
`"-"`	Solid line	————
`"--"`	Dashed line	- — — — —
`":"`	Dotted line	…………………
`"-."`	Dash-dotted line	—·—·—·—·-
`"none"`	No line	No line

`LineWidth` — Line width

`0.5` (default) | positive value

Line width, specified as a positive value in points, where 1 point = 1/72 of an inch. If the line has markers, then the line width also affects the marker edges.

The line width cannot be thinner than the width of a pixel. If you set the line width to a value that is less than the width of a pixel on your system, the line displays as one pixel wide.

`Marker` — Marker symbol

`"none"` (default) | `"o"` | `"+"` | `"*"` | `"."` | ...

Marker symbol, specified as one of the values listed in this table. By default, the object does not display markers. Specifying a marker symbol adds markers at each data point or vertex.

Marker	Description	Resulting Marker
`"o"`	Circle	○
`"+"`	Plus sign	+
`"*"`	Asterisk	✳
`"."`	Point	•
`"x"`	Cross	×

Marker	Description	Resulting Marker
`"_"`	Horizontal line	—
`"|"`	Vertical line	|
`"square"`	Square	□
`"diamond"`	Diamond	◇
`"^"`	Upward-pointing triangle	△
`"v"`	Downward-pointing triangle	▽
`">"`	Right-pointing triangle	▷
`"<"`	Left-pointing triangle	◁
`"pentagram"`	Pentagram	☆
`"hexagram"`	Hexagram	✡
`"none"`	No markers	Not applicable

`MarkerIndices` **— Indices of data points at which to display markers**
`1:length(YData)` (default) | vector of positive integers | scalar positive integer

Indices of data points at which to display markers, specified as a vector of positive integers. If you do not specify the indices, then MATLAB displays a marker at every data point.

Note

To see the markers, you must also specify a marker symbol.

Example: `plot(x,y,"-o","MarkerIndices",[1 5 10])` displays a circle marker at the first, fifth, and tenth data points.

Example: `plot(x,y,"-x","MarkerIndices",1:3:length(y))` displays a cross marker every three data points.

Example: `plot(x,y,"Marker","square","MarkerIndices",5)` displays one square marker at the fifth data point.

`MarkerEdgeColor` **— Marker outline color**
`"auto"` (default) | RGB triplet | hexadecimal color code | `"r"` | `"g"` | `"b"` | ...

Marker outline color, specified as `"auto"`, an RGB triplet, a hexadecimal color code, a color name, or a short name. The default value of `"auto"` uses the same color as the `Color` property.

For a custom color, specify an RGB triplet or a hexadecimal color code.

- An RGB triplet is a three-element row vector whose elements specify the intensities of the red, green, and blue components of the color. The intensities must be in the range `[0,1]`, for example, `[0.4 0.6 0.7]`.
- A hexadecimal color code is a string scalar or character vector that starts with a hash symbol (`#`) followed by three or six hexadecimal digits, which can range from `0` to `F`. The values are not case sensitive. Therefore, the color codes `"#FF8800"`, `"#ff8800"`, `"#F80"`, and `"#f80"` are equivalent.

Alternatively, you can specify some common colors by name. This table lists the named color options, the equivalent RGB triplets, and hexadecimal color codes.

Color Name	Short Name	RGB Triplet	Hexadecimal Color Code	Appearance
`"red"`	`"r"`	`[1 0 0]`	`"#FF0000"`	🟥
`"green"`	`"g"`	`[0 1 0]`	`"#00FF00"`	🟩
`"blue"`	`"b"`	`[0 0 1]`	`"#0000FF"`	🟦

Color Name	Short Name	RGB Triplet	Hexadecimal Color Code	Appearance
`"cyan"`	`"c"`	`[0 1 1]`	`"#00FFFF"`	🟦
`"magenta"`	`"m"`	`[1 0 1]`	`"#FF00FF"`	🟪
`"yellow"`	`"y"`	`[1 1 0]`	`"#FFFF00"`	🟨
`"black"`	`"k"`	`[0 0 0]`	`"#000000"`	⬛
`"white"`	`"w"`	`[1 1 1]`	`"#FFFFFF"`	⬜
`"none"`	Not applicable	Not applicable	Not applicable	No color

Here are the RGB triplets and hexadecimal color codes for the default colors MATLAB uses in many types of plots.

RGB Triplet	Hexadecimal Color Code	Appearance
`[0 0.4470 0.7410]`	`"#0072BD"`	🟦
`[0.8500 0.3250 0.0980]`	`"#D95319"`	🟧
`[0.9290 0.6940 0.1250]`	`"#EDB120"`	🟨
`[0.4940 0.1840 0.5560]`	`"#7E2F8E"`	🟪
`[0.4660 0.6740 0.1880]`	`"#77AC30"`	🟩
`[0.3010 0.7450 0.9330]`	`"#4DBEEE"`	🟦
`[0.6350 0.0780 0.1840]`	`"#A2142F"`	🟥

`MarkerFaceColor` — Marker fill color

`"none"` (default) | `"auto"` | RGB triplet | hexadecimal color code | `"r"` | `"g"` | `"b"` | ...

Marker fill color, specified as `"auto"`, an RGB triplet, a hexadecimal color code, a color name, or a short name. The `"auto"` option uses the same color as the `Color` property of the parent axes. If you specify `"auto"` and the axes plot box is invisible, the marker fill color is the color of the figure.

For a custom color, specify an RGB triplet or a hexadecimal color code.

- An RGB triplet is a three-element row vector whose elements specify the intensities of the red, green, and blue components of the color. The intensities must be in the range `[0,1]`, for example, `[0.4 0.6 0.7]`.
- A hexadecimal color code is a string scalar or character vector that starts with a hash symbol (`#`) followed by three or six hexadecimal digits, which can range from `0` to `F`. The values are not case sensitive. Therefore, the color codes `"#FF8800"`, `"#ff8800"`, `"#F80"`, and `"#f80"` are equivalent.

Alternatively, you can specify some common colors by name. This table lists the named color options, the equivalent RGB triplets, and hexadecimal color codes.

Color Name	Short Name	RGB Triplet	Hexadecimal Color Code	Appearance
`"red"`	`"r"`	`[1 0 0]`	`"#FF0000"`	🟥
`"green"`	`"g"`	`[0 1 0]`	`"#00FF00"`	🟩
`"blue"`	`"b"`	`[0 0 1]`	`"#0000FF"`	🟦
`"cyan"`	`"c"`	`[0 1 1]`	`"#00FFFF"`	🟦
`"magenta"`	`"m"`	`[1 0 1]`	`"#FF00FF"`	🟪
`"yellow"`	`"y"`	`[1 1 0]`	`"#FFFF00"`	🟨
`"black"`	`"k"`	`[0 0 0]`	`"#000000"`	⬛
`"white"`	`"w"`	`[1 1 1]`	`"#FFFFFF"`	⬜
`"none"`	Not applicable	Not applicable	Not applicable	No color

Here are the RGB triplets and hexadecimal color codes for the default colors MATLAB uses in many types of plots.

RGB Triplet	Hexadecimal Color Code	Appearance
`[0 0.4470 0.7410]`	`"#0072BD"`	🟦
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`[0.9290 0.6940 0.1250]`	`"#EDB120"`	🟨
`[0.4940 0.1840 0.5560]`	`"#7E2F8E"`	🟪
`[0.4660 0.6740 0.1880]`	`"#77AC30"`	🟩
`[0.3010 0.7450 0.9330]`	`"#4DBEEE"`	🟦
`[0.6350 0.0780 0.1840]`	`"#A2142F"`	🟥

`MarkerSize` — Marker size

6 (default) | positive value

Marker size, specified as a positive value in points, where 1 point = 1/72 of an inch.

`DatetimeTickFormat` — Format for `datetime` tick labels

character vector | string

Format for `datetime` tick labels, specified as the comma-separated pair consisting of `"DatetimeTickFormat"` and a character vector or string containing a date format. Use the letters `A-Z` and `a-z` to construct a custom format. These letters correspond to the Unicode® Locale Data Markup Language (LDML) standard for dates. You can include non-ASCII letter characters such as a hyphen, space, or colon to separate the fields.

If you do not specify a value for `"DatetimeTickFormat"`, then `plot` automatically optimizes and updates the tick labels based on the axis limits.

Example: `"DatetimeTickFormat","eeee, MMMM d, yyyy HH:mm:ss"` displays a date and time such as `Saturday, April 19, 2014 21:41:06`.

The following table shows several common display formats and examples of the formatted output for the date, Saturday, April 19, 2014 at 9:41:06 PM in New York City.

Value of `DatetimeTickFormat`	Example
`"yyyy-MM-dd"`	`2014-04-19`
`"dd/MM/yyyy"`	`19/04/2014`
`"dd.MM.yyyy"`	`19.04.2014`
`"yyyy年 MM月 dd日"`	`2014年 04月 19日`
`"MMMM d, yyyy"`	`April 19, 2014`
`"eeee, MMMM d, yyyy HH:mm:ss"`	`Saturday, April 19, 2014 21:41:06`
`"MMMM d, yyyy HH:mm:ss Z"`	`April 19, 2014 21:41:06 -0400`

For a complete list of valid letter identifiers, see the `Format` property for datetime arrays.

`DatetimeTickFormat` is not a chart line property. You must set the tick format using the name-value pair argument when creating a plot. Alternatively, set the format using the `xtickformat` and `ytickformat` functions.

The `TickLabelFormat` property of the datetime ruler stores the format.

`DurationTickFormat` — Format for `duration` tick labels

character vector | string

Format for `duration` tick labels, specified as the comma-separated pair consisting of `"DurationTickFormat"` and a character vector or string containing a duration format.

If you do not specify a value for `"DurationTickFormat"`, then `plot` automatically optimizes and updates the tick labels based on the axis limits.

To display a duration as a single number that includes a fractional part, for example, 1.234 hours, specify one of the values in this table.

Value of `DurationTickFormat`	Description
`"y"`	Number of exact fixed-length years. A fixed-length year is equal to 365.2425 days.
`"d"`	Number of exact fixed-length days. A fixed-length day is equal to 24 hours.
`"h"`	Number of hours
`"m"`	Number of minutes
`"s"`	Number of seconds

Example: `"DurationTickFormat","d"` displays duration values in terms of fixed-length days.

To display a duration in the form of a digital timer, specify one of these values.

- `"dd:hh:mm:ss"`
- `"hh:mm:ss"`
- `"mm:ss"`
- `"hh:mm"`

In addition, you can display up to nine fractional second digits by appending up to nine `S` characters.

Example: `"DurationTickFormat","hh:mm:ss.SSS"` displays the milliseconds of a duration value to three digits.

`DurationTickFormat` is not a chart line property. You must set the tick format using the name-value pair argument when creating a plot. Alternatively, set the format using the `xtickformat` and `ytickformat` functions.

The `TickLabelFormat` property of the duration ruler stores the format.

Tips

- Use `NaN` and `Inf` values to create breaks in the lines. For example, this code plots the first two elements, skips the third element, and draws another line using the last two elements:

  ```
  plot([1,2,NaN,4,5])
  ```

- `plot` uses colors and line styles based on the `ColorOrder` and `LineStyleOrder` properties of the axes. `plot` cycles through the colors with the first line style. Then, it cycles through the colors again with each additional line style.

  You can change the colors and the line styles after plotting by setting the `ColorOrder` or `LineStyleOrder` properties on the axes. You can also call the `colororder` function to change the color order for all the axes in the figure. *(since R2019b)*

Extended Capabilities

› **Tall Arrays**
Calculate with arrays that have more rows than fit in memory.

› **GPU Arrays**
Accelerate code by running on a graphics processing unit (GPU) using Parallel Computing Toolbox™.

› **Distributed Arrays**
Partition large arrays across the combined memory of your cluster using Parallel Computing Toolbox™.

Version History

expand all

Introduced before R2006a

› **R2022b:** Plots created with tables preserve special characters in axis and legend labels⚠

› **R2022a:** Pass tables directly to `plot`

See Also

Functions

`title` | `xlabel` | `ylabel` | `xlim` | `ylim` | `legend` | `hold` | `gca` | `yyaxis` | `plot3` | `loglog`

Properties

Line Properties

Topics

Plot Dates and Times

Plot Categorical Data

Plots That Support Tables

External Websites

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