



Figure

A window which includes graphic objects

Plot

A graphic object with axis

Graph

A drawing in a graphic object

MATLAB and Octave for beginners

To better understand and explain, it is necessary to draw a graph of a function or data. Often, there are several sets of data to be compared you must use different colors and symbols and in the end you would like to save the graphic into an image so pdf, png or jpeg that you would like to include in a presentation or a web page so there are several kind of charts that you can do 2 dimensional, 3 dimensional lines or surfaces we are used to specific mathematical language for graphics It is also the case or a cave or a MATLAB. So you have to learn the language in order to understand the mechanism. First, what is a figure? A figure is a window on your screen. One can have window one, window two etc Each figure is the name, figure one figure two and so on. In a figure there may be one or more graphical objects that we call plots. A plot generally generally has axis which define the unit and the interval we want to show. so in a plot then we can draw a draw, one or more graphics that is points or curves describe that there coordinate. so lets see this curve how we can draw it so it is characterized by the style which one draw which one uses color, symbol that we want to put at each point and then connect the points with a specific line style.

Notes

Summary



0m 04s

2D graphics

```
>> edit plotting2D.m
>> |
```

Command Window

```
2 ##
3 ## This program is free software; you can redistribute it and/or modify it
4 ## under the terms of the GNU General Public License as published by
5 ## the Free Software Foundation; either version 3 of the License, or
6 ## (at your option) any later version.
7 ##
8 ## This program is distributed in the hope that it will be useful,
9 ## but WITHOUT ANY WARRANTY; without even the implied warranty of
10 ## MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
11 ## GNU General Public License for more details.
12 ##
13 ## You should have received a copy of the GNU General Public License
14 ## along with this program. If not, see <http://www.gnu.org/licenses/>.
15 ##
16 ## -*- texinfo -*-
17 ## @deftypefn {Function File} {@var{retval} =} plotting2D (@var{input1}, @var{
18 ##
19 ## @seealso{}
20 ## @enddeftypefn
21 ##
22 ## Author: moocadmin <moocadmin@cedegemac16.epfl.ch>
23 ## Created: 2015-11-20
24 ##
25 function [retval] = plotting2D (input1, input2)
26
27 endfunction
28
```

GUI

MATLAB and Octave for beginners

As I already explain I prefer to use scripts to be able to coordinate my work. So first I open my script they call plotting 2d edit plotting to 2d dot m and then have this file, it's a new one and I remove everything within because they want to write a script from scratch.

Notes

Summary



1m 42s

2D graphics

```
>> edit plotting2D.m  
>> |
```

Command Window

GUI

Current Directory: /Users/moocadmin/IntroductionOctave
Experimental GUI Info

Editor

plotting2D.m

1
2 figure(1)

MATLAB and Octave for beginners

so now I have my empty file and that would like to define my graphics here.

Notes

Summary

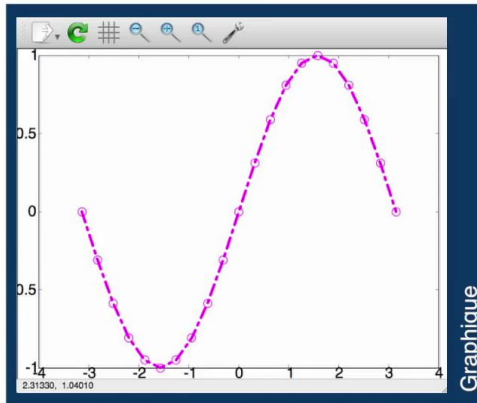


2m 04s

2D graphics

```
>> edit plotting2D.m
>> plotting2D
>> plotting2D
>>
```

Command Window



Graphique

```
1 figure(1);
2
3
4 x = linspace(-pi, pi, 21);
5 y = sin(x);
6 plot(x, y, 'm:o');
```

GUI

MATLAB and Octave for beginners

so first I would like to address figure 1 okay so I open figure 1 and when I run this script there will be, I will have a new window. which is figure 1 and now I can put something in this figure. For example: I take a vector x which is a vector with some points so minus pi to pi and I say for example 21 points equally distributed between minus pi and pi and why for example: I can take the sine of this vector so is a element by element operations so I sine of the first point sine of the second point and so and so y is a vector of the same size as x This is very important. when we plot x comma y It is very important that there it is two vectors have the same size. okay So when I run the script I can run it from here with this arrow, so play and I see that my figure is now this nice sine function. Now I would like to improve a little bit my script for example I would like to change the color of my graphics so I use m for magenta colon so that the connection between dots is made by little dots and then all to see that I want a big dot at each point and now I run it and I see a different style for my plot.

Notes

Summary

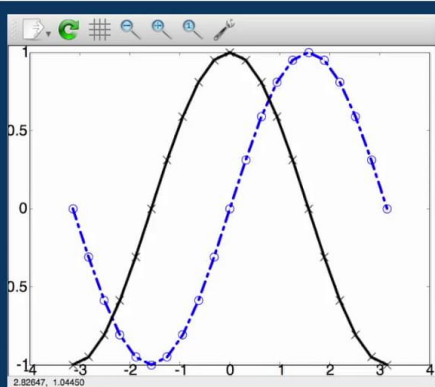


2m 12s

2D graphics

```
>> edit plotting2D.m  
>> plotting2D  
>> plotting2D  
>> plotting2D  
>> plotting2D  
>> |
```

Command Window



Graphique

```
1 figure(1);  
2  
3  
4 x = linspace(-pi, pi, 21);  
5 y = sin(x);  
6 plot(x, y, 'b:o', x, cos(x), 'k-x');  
7 title('Sin et Cos')  
8 legend('sin(x)', 'cos(x)')  
9 xla
```

GUI

MATLAB and Octave for beginners

when I do x and y here the first tournament of x and y are drawn and then the second one and so on so I see this circle these weak points that defines the star that are defined by this time I still want to improve my plot for example I would like to also add the cos function. so I can say x and then instead of computing a new variable and just computing cos of x directly inside my plot function and then I change my style of instead of saying magenta I say black and then dashes and then I want a little cross at each point. and so I see that having black my new function calls and they both show up sin and cos in the same figure. So what I might want to put now I would like to put a title A title I use a common title and I say a string which say sine and cos and then I want to put legend so so to say what are these lines. so the first line is a sine, so I have to put the string sine is the first couple x and y sine of x so this will be the text given to the legend for the first line of the first curve and then cos of the second one now I have my legend then I would like to name, the axis.

Notes

Summary

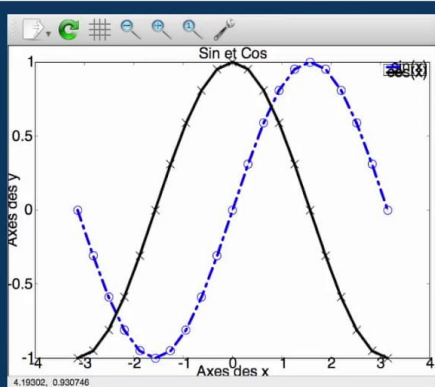


3m 57s

2D graphics

```
>> edit plotting2D.m
>> plotting2D
>> plotting2D
>> plotting2D
>> plotting2D
>>
```

Command Window



Graphique

```
1 figure(1);
2
3
4 x = linspace(-pi, pi, 21);
5 y = sin(x);
6 plot(x, y, 'b:o', x, cos(x), 'k-x');
7 title('Sin et Cos')
8 legend('sin(x)', 'cos(x)')
9 xlabel('Axes des x')
10 ylabel('Axes des y')
11
12 saveas(gca, 'myPlot.pdf', 'pdf')
13
14 help saveas
15 help plot
16 doc plot
17 doc saveas
18
```

GUI

MATLAB and Octave for beginners

and for that have to give a label so x label to give the name to the x axis and so I hear a name it axes des that means x axis and then y axis just change the y here and then I execute the script and I see all the elements, the title, the labels and then here is the legend but may be there is a little bug in Octave so here is Is there probably in your screen. this is much better I don't know why here so buggy so what is left to do may be we would like to save the figure in a pdf file or a jpeg. so we use the command save as okay but what does this command require? so first I need to know what you want to save and what we want to say is the current figure and the current figure is called gca so is the figure that is being used at the last time so is the figure 1 in this case but gca is the correct argument to give and then I name I give a name to the file and they say my plot of pdf and then I have to give the kind of graphics that I want to save so in pdf and then I can run so this clip will not only draw a pretty figure on the screen but will also save a pdf file. ready for use in your presentation. You can also use other formats for saving figures you need just to type help save as and then you will have different ways for saving your graphics. You can also use help plot or doc plot to see other ways of plotting.

Notes

Summary



5m 42s