

Scilab:Graphics

Anuradha Amrutkar

anuradha.amrutkar@gmail.com

Indian Institute Of Technology, Bombay.

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Scilab can produce many types of 2D and 3D plots. Following is the list of several common charts that Scilab can create:

- x-y plot: plot,
- contour plots: contour,
- 3D plots: surf,
- histograms: histplot,
- bar charts: bar,
- etc...

Plotting Simple 2D Plot:

```
-- > x=linspace(12,34,10);  
-- > y=linspace(-.1,2,10);  
-- > plot2d(x,y,style=1)
```

Plotting Simple 2D Plot with vectorized function:

```
-- > function f = myquadratic(x);  
-- > f = x ^ 2  
-- > endfunction  
-- > xdata=linspace(1,10,50);  
-- > ydata=myquadratic(xdata);  
-- > plot(xdata,ydata)
```

Plotting Simple 2D Plot with vectorized function:

```
-- > function f = myquadratic(x);  
-- > f = x ^ 2  
-- > endfunction  
-- > xdata=linspace(1,10,50);  
-- > plot(xdata,myquadratic)
```

Try this some known Graphs:

- $\cos(x)$
- x^2
- $\exp(x)$

Inline Function Definition:

$$y = 3x + x\sin x$$

```
-- > deff ('[y]=f(x)', 'y=3*x+x.*sin(x)')  
-- > x=1:.5:100;  
-- > fplot2d(x,f)
```

Try with **Help**:

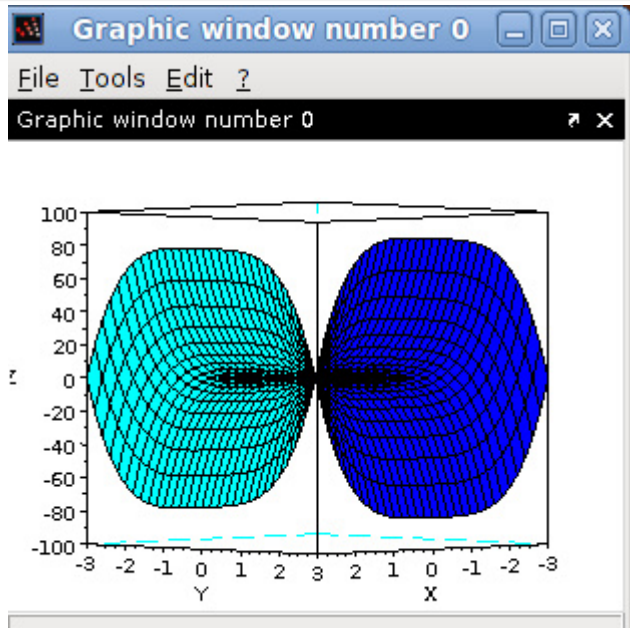
$$y = \frac{x * \text{abs}(x)}{(1 + x^2)} \quad (1)$$

- plot2d(x,y)
- fplot2d(x,f)
- fplot2d1(x,f)
- plot2d2(x,y)

To Obtain 3-D figure for the equation $z = x^4 - y^4$

```
-- > deff ('[z]=f(x,y)', 'z = x^4 - y^4')  
-- > x=-3:.2:3; y=x;  
-- > fplot3d(x,y,f)
```

Scilab:Graphics - 3D Plot



$$z = x^3 - y^3$$

```
-- > deff ('z=f(x,y)', 'z = x^3 - y^3')  
-- > x=-3:.2:3; y=x;  
-- > fplot3d(x,y,f)
```

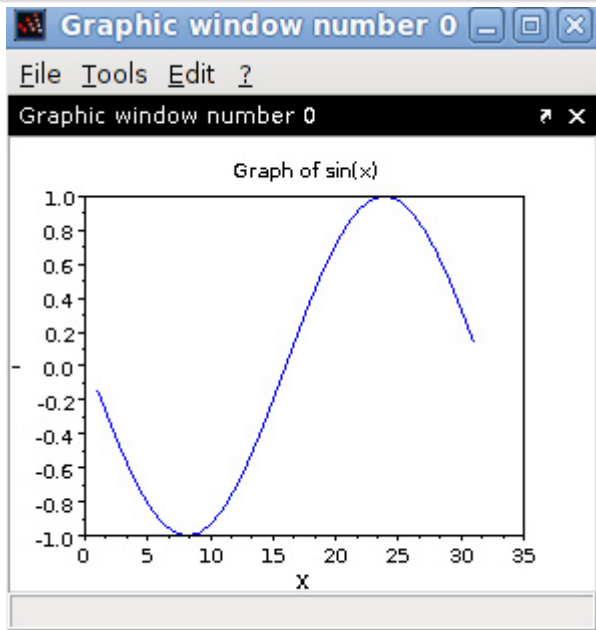
$$z = \sin(x^2) - y^2$$

```
-- > deff ('z=f(x,y)', 'z = sin(x^2) - y^2')  
-- > x=-3:.2:3; y=x;  
-- > fplot3d1(x,y,f)
```

We can label X-axis, Y-axis and assign title to the graph:

```
-- > xlabel('X');  
-- > ylabel('Y');  
-- > xtitle('Graph of sin(x)');  
-- > plot(sin(x))
```

Scilab:Graphics - Titles, Axis and Legends



We want to compare some graphs. With same set of points. In that case, we can have more than one graph at a time.

```
-- > deff ('z=myquadratic(x)', 'z = x ^ 2')
-- > deff ('z=myquadratic2(x)', 'z = 2*(x^ 2)+4')
-- > xdata=linspace(1,10,50);
-- > ydata=myquadratic(xdata);
-- > plot(xdata,ydata," o")
-- > ydata2=myquadratic2(xdata);
-- > plot(xdata,ydata2," +")
-- > xtitle(" My Title", "X-axis", "Y-axis")
```

Observe the occurrence of 'x' for each of the function in the plot command

There is same colour for each graph, since there are more than one graph in one graph window. We would like to know which graphs goes to which function.

for that legend command can be used.

```
-- > legend("x ^ 2", "2*x^ 2+4")
```

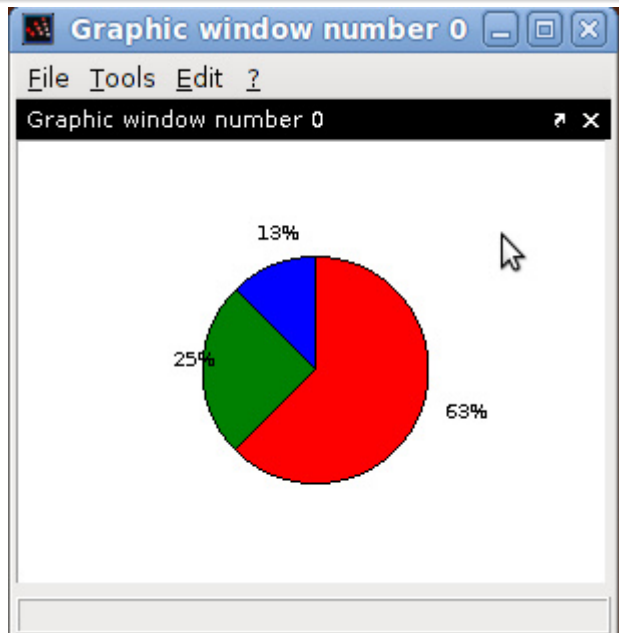
Will put colour marks with the function name.


```
-- >subplot(2,2,2)
-- >plot2d(x,sin(x),[2])
-- >subplot(2,2,3)
-- >plot2d2(x,sin(x),[3])
-- >subplot(2,2,4)
-- >plot2d3(x,sin(x),[4])
```

```
-- >pie([1, 2, 5])
```

since $1+2+5=8$, we will see a circle divided in to 8 parts, out of which 1, 2 and 5 parts are denoted by different colours.

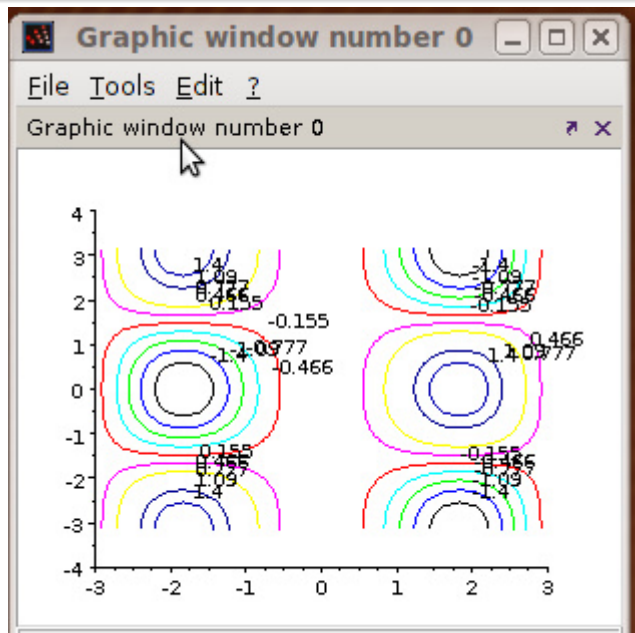
Scilab:Graphics - Pie Graph



Contour draws level curves of the given surface. It compute max and min for the surface. Then divide open interval (min, max) into number of level curves we asked for. Accordingly it draws the contour.

```
-- > t = linspace(-pi, pi, 30);  
-- > function z = mysurface(x,y);  
-- > z = x * sin(x) ^ 2 * cos(y);  
-- > endfunction  
-- > contour(t,t,mysurface,10)
```

Scilab:Graphics - Contour



Try Out this graphs usind **Help**:

- 3D plots: surf,
- histograms: histplot,
- bar charts: bar,
- etc...

Thank You!

- www.scilab.org
- www.scilab.in
- <http://scilab.in/cgi-bin/mailman/listinfo/scilab-india>
- Modeling and Simulation in Scilab/Scicos by Stephen L.Campbell, Jean-Philippe Chancelier and Ramine Nikoukah, (Springer)