How to put the legend out of the plot

Asked 9 years, 11 months ago Active 9 days ago Viewed 948k times

1092

642

I have a series of 20 plots (not subplots) to be made in a single figure. I want the legend to be outside of the box. At the same time, I do not want to change the axes, as the size of the figure gets reduced. Kindly help me for the following queries:

1. I want to keep the legend box outside the plot area. (I want the legend to be outside at the right side of the plot area).
2. Is there anyway that I reduce the font size of the text inside the legend box, so that the size of the legend box will be small.

python matplotlib legend

edited Jul 7 '18 at 15:04
ImportanceOfBeingErnest
231k 29 402 471

asked Jan 15 '11 at 16:10
pottigopi
10.9k 3 12 4

17 Answers

Active Oldest Votes

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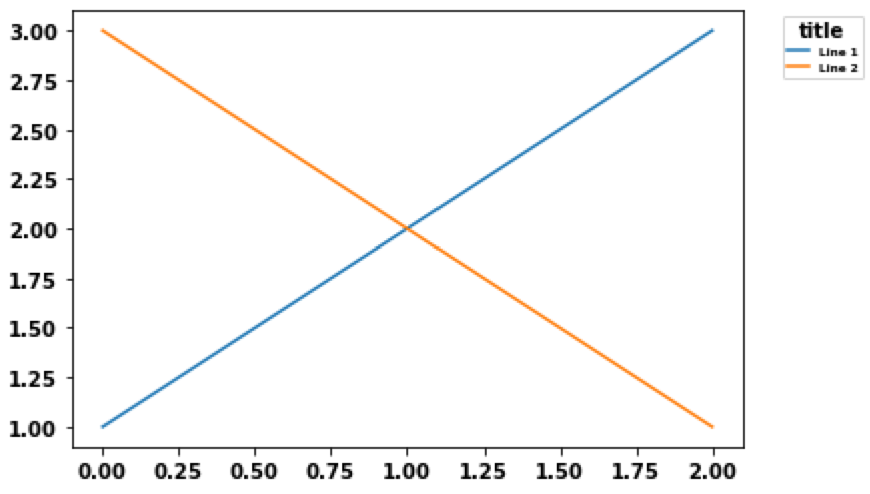
- You can make the legend text smaller by specifying `set_size` of `FontProperties`.
- Resources:
  - Legend guide
  - `matplotlib.legend`
  - `matplotlib.pyplot.legend`
  - `matplotlib.font_manager`
    - `set_size(self, size)`
    - Valid font size are xx-small, x-small, small, medium, large, x-large, xx-large, larger, smaller, None
  - Real Python: Python Plotting With Matplotlib (Guide)

```
import matplotlib.pyplot as plt
from matplotlib.font_manager import FontProperties

fontP = FontProperties()
fontP.set_size('xx-small')
```

```
plt.legend(handles=[p1, p2], title='title', bbox_to_anchor=(1.05, 1), loc='upper left',
prop=fontP)
```



- As noted by Mateen Ulhaq, `fontsize='xx-small'` also works, without importing `FontProperties`.

```
plt.legend(handles=[p1, p2], title='title', bbox_to_anchor=(1.05, 1), loc='upper left',
fontsize='xx-small')
```

edited Aug 18 at 22:22
Trenton McKinney
22.5k 14 35 52

answered Jan 15 '11 at 16:21
Navi
6,878 3 31 30

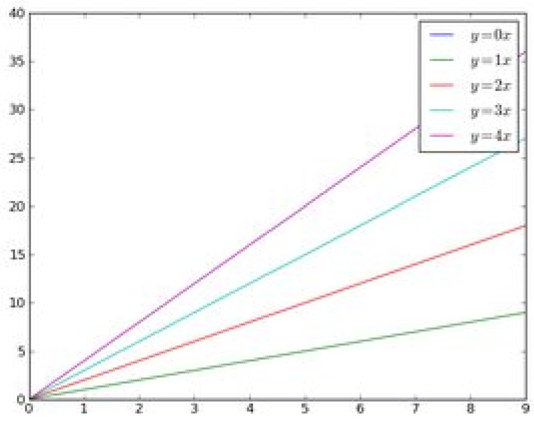
1920

There are a number of ways to do what you want. To add to what @inalis and @Navi already said, you can use the `bbox_to_anchor` keyword argument to place the legend partially outside the axes and/or decrease the font size.

Before you consider decreasing the font size (which can make things awfully hard to read), try playing around with placing the legend in different places:

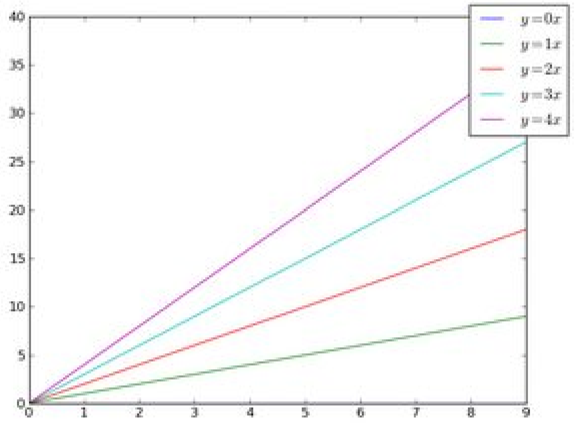
So, let's start with a generic example:

```
import matplotlib.pyplot as plt
import numpy as np

x = np.arange(10)

fig = plt.figure()
ax = plt.subplot(111)

for i in xrange(5):
    ax.plot(x, i * x, label='$y = %ix$' % i)
```



If we do the same thing, but use the `bbox_to_anchor` keyword argument we can shift the legend slightly outside the axes boundaries:

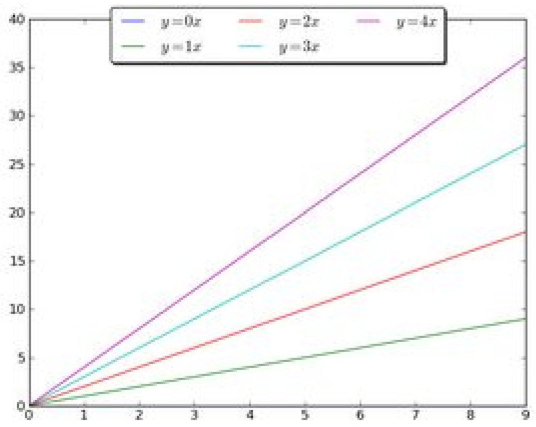
```
import matplotlib.pyplot as plt
import numpy as np

x = np.arange(10)

fig = plt.figure()
ax = plt.subplot(111)

for i in xrange(5):
    ax.plot(x, i * x, label='$y = %ix$' % i)

ax.legend(bbox_to_anchor=(1.1, 1.05))

plt.show()
```



Similarly, make the legend more horizontal and/or put it at the top of the figure (I'm also turning on rounded corners and a simple drop shadow):

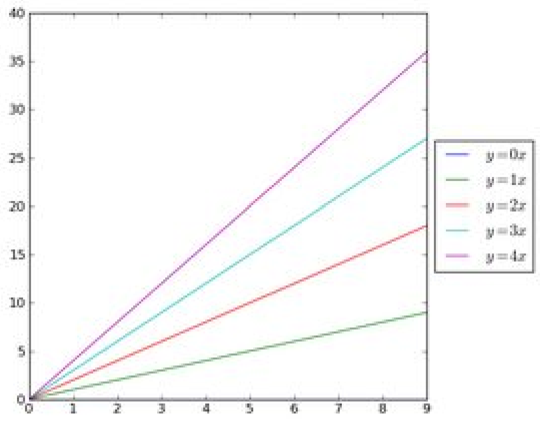
```
import matplotlib.pyplot as plt
```

```
fig = plt.figure()
ax = plt.subplot(111)

for i in xrange(5):
    line, = ax.plot(x, i * x, label='$y = %ix$'%i)

ax.legend(loc='upper center', bbox_to_anchor=(0.5, 1.05),
          ncol=3, fancybox=True, shadow=True)
plt.show()
```



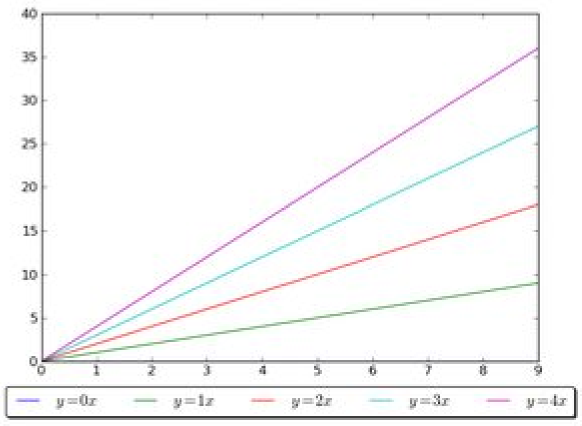
Alternatively, shrink the current plot's width, and put the legend entirely outside the axis of the figure (note: if you use `tight_layout()` , then leave out `ax.set_position()` :

```
import matplotlib.pyplot as plt
import numpy as np

x = np.arange(10)

fig = plt.figure()
ax = plt.subplot(111)

for i in xrange(5):
    ax.plot(x, i * x, label='$y = %ix$'%i)

# Shrink current axis by 20%
box = ax.get_position()
ax.set_position([box.x0, box.y0, box.width * 0.8, box.height])

# Put a legend to the right of the current axis
ax.legend(loc='center left', bbox_to_anchor=(1, 0.5))

plt.show()
```



And in a similar manner, shrink the plot vertically, and put a horizontal legend at the bottom:

```
import matplotlib.pyplot as plt
import numpy as np

x = np.arange(10)

fig = plt.figure()
ax = plt.subplot(111)

for i in xrange(5):
    line, = ax.plot(x, i * x, label='$y = %ix$'%i)

# Shrink current axis's height by 10% on the bottom
box = ax.get_position()
ax.set_position([box.x0, box.y0 + box.height * 0.1,
                 box.width, box.height * 0.9])

# Put a legend below current axis
ax.legend(loc='upper center', bbox_to_anchor=(0.5, -0.05),
          fancybox=True, shadow=True, ncol=5)

plt.show()
```



Have a look at the matplotlib legend guide. You might also take a look at `plt.figlegend()`

Trenton McKinney **22.5k** 14 35 52 Joe Kington **228k** 60 537 439

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Placing the legend (`bbox_to_anchor`)

A legend is positioned inside the bounding box of the axes using the `loc` argument to `plt.legend`.
E.g. `loc="upper right"` places the legend in the upper right corner of the bounding box, which by default extents from `(0,0)` to `(1,1)` in axes coordinates (or in bounding box notation `(x0,y0, width, height)=(0,0,1,1)`).

To place the legend outside of the axes bounding box, one may specify a tuple `(x0,y0)` of axes coordinates of the lower left corner of the legend.

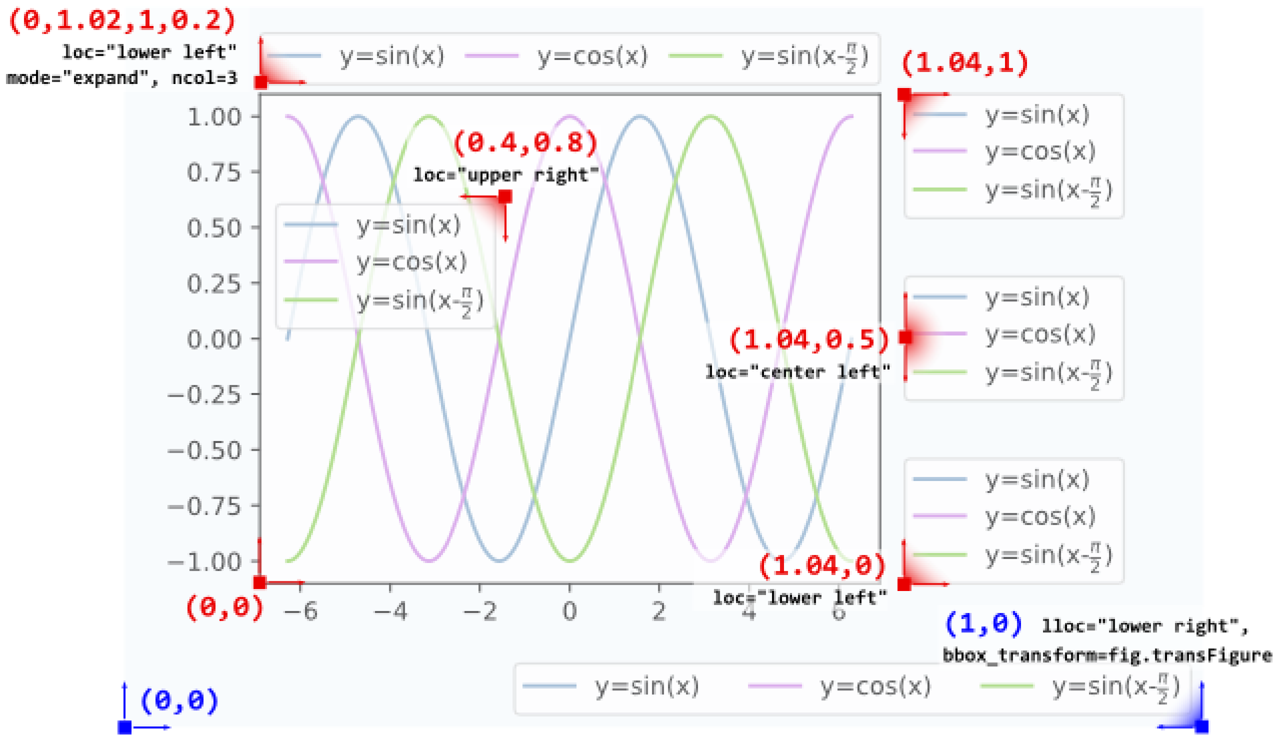
```
plt.legend(loc=(1.04,0))
```

A more versatile approach is to manually specify the bounding box into which the legend should be placed, using the **`bbox_to_anchor`** argument. One can restrict oneself to supply only the `(x0, y0)` part of the bbox. This creates a zero span box, out of which the legend will expand in the direction given by the `loc` argument. E.g.

```
plt.legend(bbox_to_anchor=(1.04,1), loc="upper left")
```

places the legend outside the axes, such that the upper left corner of the legend is at position `(1.04,1)` in axes coordinates.

Further examples are given below, where additionally the interplay between different arguments like `mode` and `ncols` are shown.



```
l1 = plt.legend(bbox_to_anchor=(1.04,1), borderaxespad=0)
l2 = plt.legend(bbox_to_anchor=(1.04,0), loc="lower left", borderaxespad=0)
l3 = plt.legend(bbox_to_anchor=(1.04,0.5), loc="center left", borderaxespad=0)
l4 = plt.legend(bbox_to_anchor=(0,1.02,1,0.2), loc="lower left",
                mode="expand", borderaxespad=0, ncol=3)
l5 = plt.legend(bbox_to_anchor=(1,0), loc="lower right",
                bbox_transform=fig.transFigure, ncol=3)
l6 = plt.legend(bbox_to_anchor=(0.4,0.8), loc="upper right")
```

Details about how to interpret the 4-tuple argument to `bbox_to_anchor`, as in `l4`, can be found in this question. The `mode="expand"` expands the legend horizontally inside the bounding box given by the 4-tuple. For a vertically expanded legend, see this question.

Sometimes it may be useful to specify the bounding box in figure coordinates instead of axes coordinates. This is shown in the example `l5` from above, where the `bbox_transform` argument is used to put the legend in the lower left corner of the figure.

Postprocessing

Having placed the legend outside the axes often leads to the undesired situation that it is completely or partially outside the figure canvas.

Solutions to this problem are:

- **Adjust the subplot parameters**
  One can adjust the subplot parameters such, that the axes take less space inside the figure (and thereby leave more space to the legend) by using `plt.subplots_adjust`. E.g.

leaves 30% space on the right-hand side of the figure, where one could place the legend.

- **Tight layout**
  Using `plt.tight_layout` Allows to automatically adjust the subplot parameters such that the elements in the figure sit tight against the figure edges. Unfortunately, the legend is not taken into account in this automatism, but we can supply a rectangle box that the whole subplots area (including labels) will fit into.

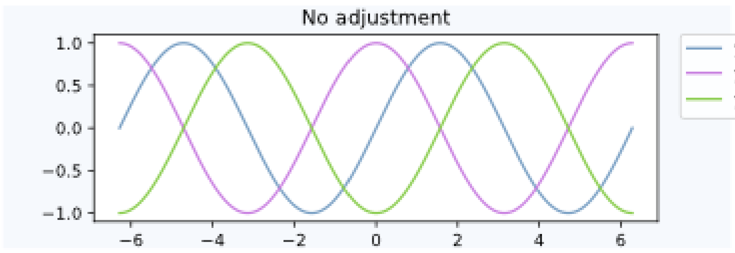
  ```
  plt.tight_layout(rect=[0,0,0.75,1])
  ```

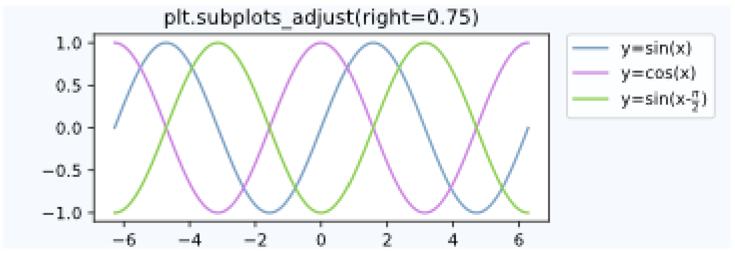
- **Saving the figure with `bbox_inches = "tight"`**
  The argument `bbox_inches = "tight"` to `plt.savefig` can be used to save the figure such that all artist on the canvas (including the legend) are fit into the saved area. If needed, the figure size is automatically adjusted.

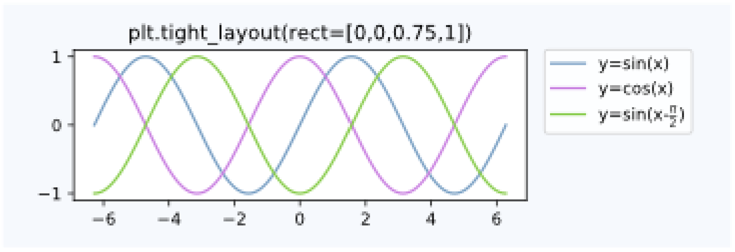
  ```
  plt.savefig("output.png", bbox_inches="tight")
  ```

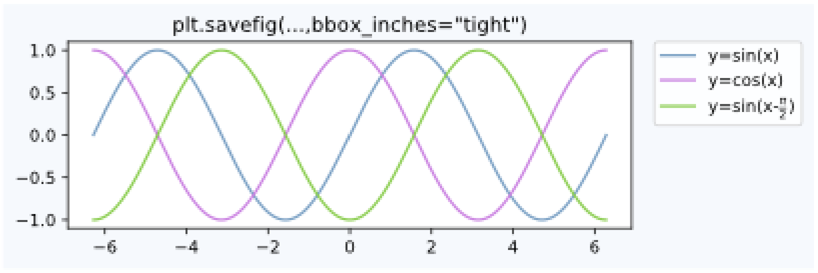
- **automatically adjusting the subplot params**
  A way to automatically adjust the subplot position such that the legend fits inside the canvas **without changing the figure size** can be found in this answer: Creating figure with exact size and no padding (and legend outside the axes)

Comparison between the cases discussed above:









Alternatives

A figure legend

One may use a legend to the figure instead of the axes, `matplotlib.figure.Figure.legend` . This has become especially useful for matplotlib version >=2.1, where no special arguments are needed

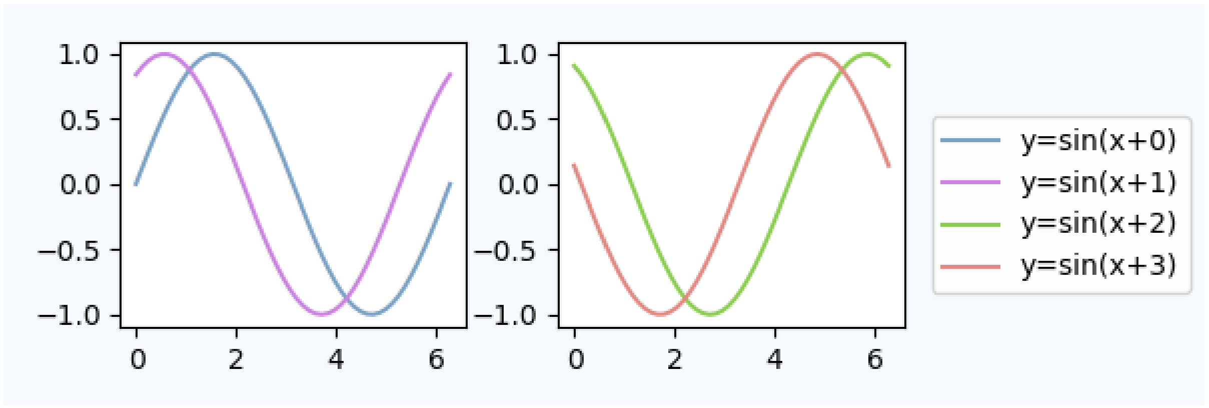
```
fig.legend(loc=7)
```

to create a legend for all artists in the different axes of the figure. The legend is placed using the `loc` argument, similar to how it is placed inside an axes, but in reference to the whole figure - hence it will be outside the axes somewhat automatically. What remains is to adjust the subplots such that there is no overlap between the legend and the axes. Here the point *"Adjust the subplot parameters"* from above will be helpful. An example:

```
import numpy as np
```

```
colors=["#7aa0c4","#ca82e1" ,"#8bcd50","#e18882"]
fig, axes = plt.subplots(ncols=2)
for i in range(4):
    axes[i//2].plot(x,np.sin(x+i), color=colors[i],label="y=sin(x+{})".format(i))

fig.legend(loc=7)
fig.tight_layout()
fig.subplots_adjust(right=0.75)
plt.show()
```



Legend inside dedicated subplot axes

An alternative to using `bbox_to_anchor` would be to place the legend in its dedicated subplot axes (`lax`). Since the legend subplot should be smaller than the plot, we may use `gridspec_kw={"width_ratios":[4,1]}` at axes creation. We can hide the axes `lax.axis("off")` but still put a legend in. The legend handles and labels need to obtained from the real plot via `h,l = ax.get_legend_handles_labels()` , and can then be supplied to the legend in the `lax` subplot, `lax.legend(h,l)` . A complete example is below.

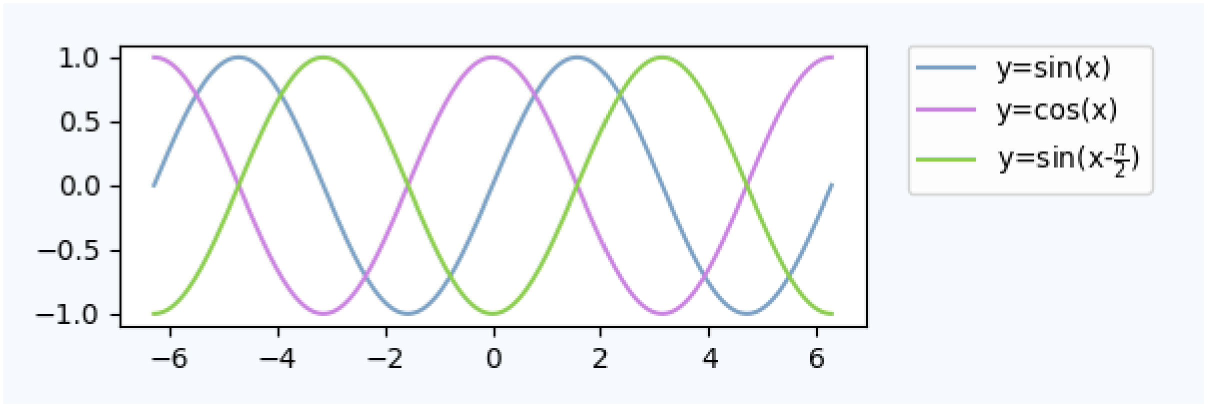
```
import matplotlib.pyplot as plt
plt.rcParams["figure.figsize"] = 6,2

fig, (ax,lax) = plt.subplots(ncols=2, gridspec_kw={"width_ratios":[4,1]})
ax.plot(x,y, label="y=sin(x)")
....

h,l = ax.get_legend_handles_labels()
lax.legend(h,l, borderaxespad=0)
lax.axis("off")

plt.tight_layout()
plt.show()
```

This produces a plot, which is visually pretty similar to the plot from above:



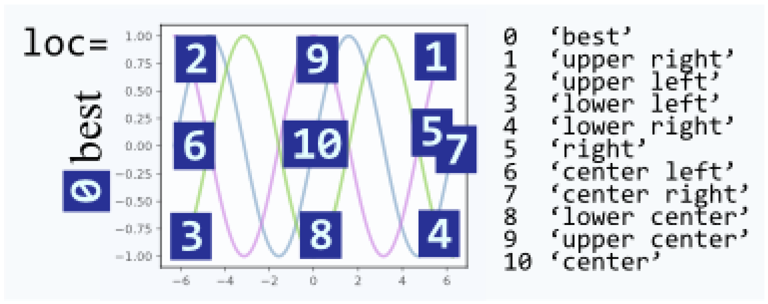
We could also use the first axes to place the legend, but use the `bbox_transform` of the legend axes,

```
ax.legend(bbox_to_anchor=(0,0,1,1), bbox_transform=lax.transAxes)
lax.axis("off")
```

In this approach, we do not need to obtain the legend handles externally, but we need to specify the `bbox_to_anchor` argument.

Further reading and notes:

- Consider the matplotlib legend guide with some examples of other stuff you want to do with legends.
- Some example code for placing legends for pie charts may directly be found in answer to this question: Python - Legend overlaps with the pie chart
- The `loc` argument can take numbers instead of strings, which make calls shorter, however, they are not very intuitively mapped to each other. Here is the mapping for reference:



```
0  'best'
1  'upper right'
2  'upper left'
3  'lower left'
4  'lower right'
5  'right'
6  'center left'
7  'center right'
8  'lower center'
9  'upper center'
10 'center'
```

edited Dec 11 at 17:14
Trenton McKinney 22.5k 14 35 52

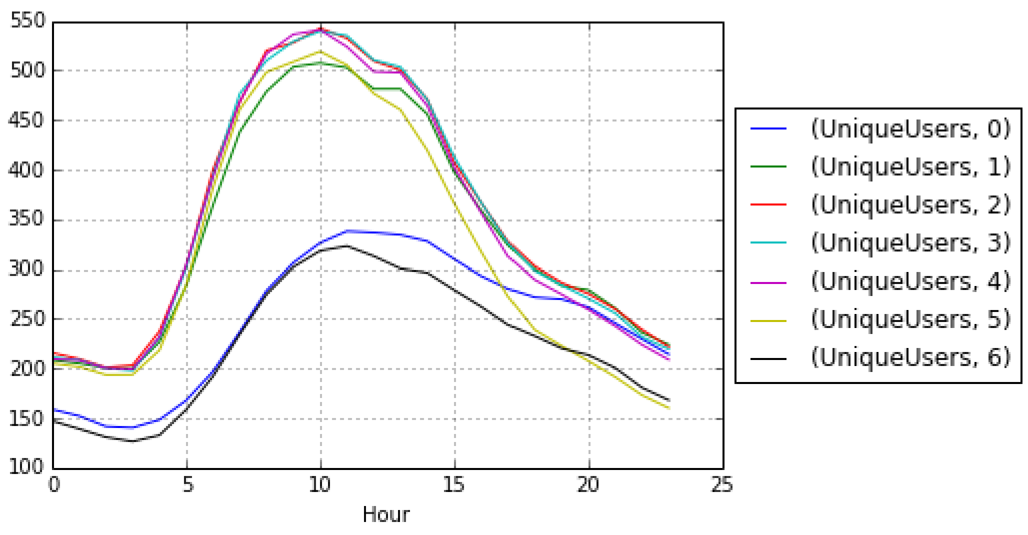
answered Apr 16 '17 at 16:04
ImportanceOfBeingErnest 231k 29 402 471

Just call `legend()` call after the `plot()` call like this:

```
# matplotlib
plt.plot(...)
plt.legend(loc='center left', bbox_to_anchor=(1, 0.5))

# Pandas
df.myCol.plot().legend(loc='center left', bbox_to_anchor=(1, 0.5))
```

Results would look something like this:



edited Oct 16 '18 at 3:01 answered Jul 3 '14 at 2:43
Shital Shah
43.3k 9 184 143

4 works when passing the same parameters to matplotlib.pyplot.legend as well – kidmose Oct 25 '16 at 9:54

10 Does this cut off the words in the legend for anyone else? – user1717828 Jan 25 '19 at 3:01

Calling "tight_layout()" fixes the cut off words for me. – Will Oct 29 at 3:53

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To place the legend outside the plot area, use `loc` and `bbox_to_anchor` keywords of `legend()` . For example, the following code will place the legend to the right of the plot area:

```
legend(loc="upper left", bbox_to_anchor=(1,1))
```

For more info, see the legend guide

edited Jan 18 '19 at 11:54 answered Jan 15 '11 at 16:41
Francesco Boi Christian Alis
4,957 5 49 77 **5,374** 3 23 27

2 @astromax I'm not sure but perhaps try calling `plt.tight_layout()` ? – Christian Alis Jul 5 '15 at 19:07

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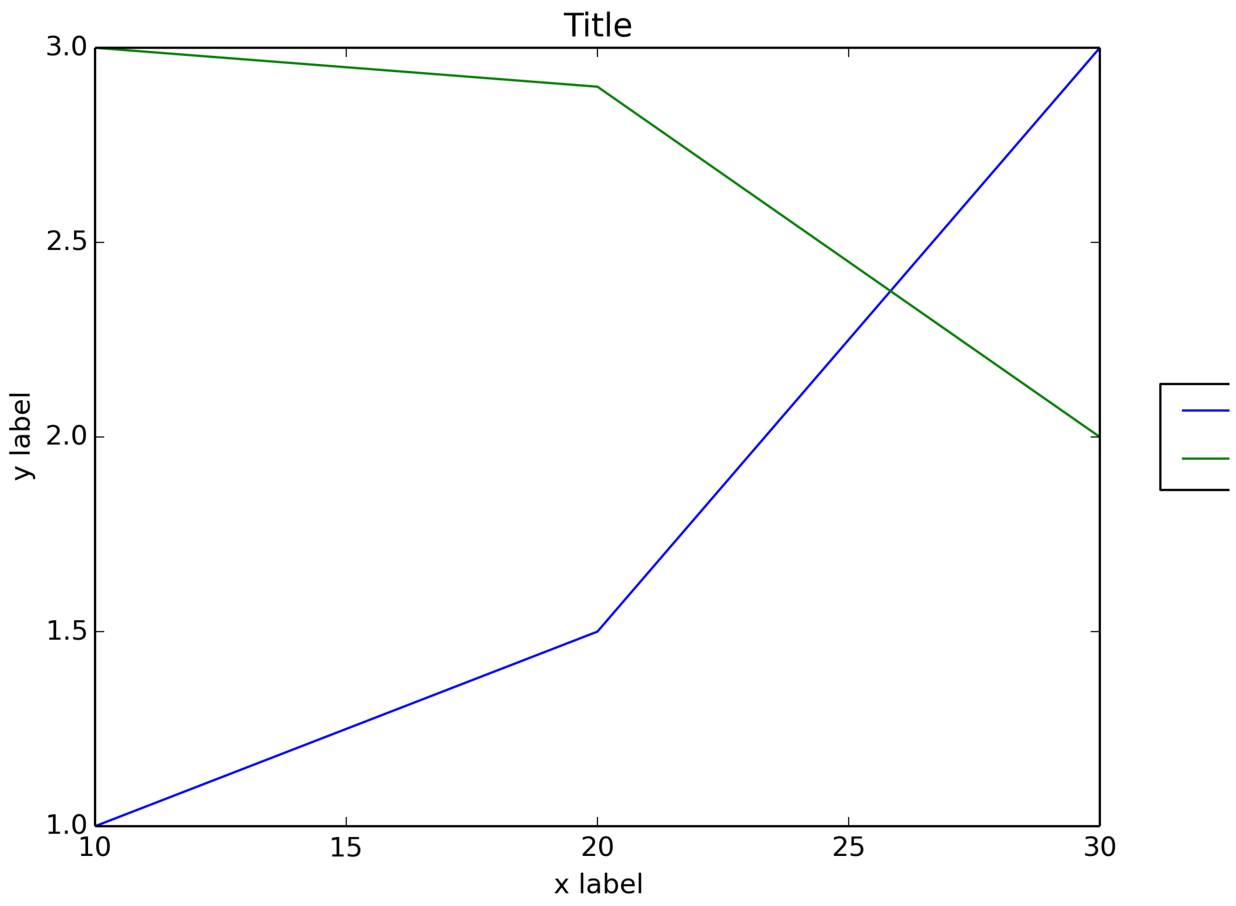
Short answer: you can use `bbox_to_anchor` + `bbox_extra_artists` + `bbox_inches='tight'` .

Longer answer: You can use `bbox_to_anchor` to manually specify the location of the legend box, as some other people have pointed out in the answers.

However, the usual issue is that the legend box is cropped, e.g.:

```
import matplotlib.pyplot as plt

# data
all_x = [10,20,30]
all_y = [[1,3], [1.5,2.9],[3,2]]

# Plot
fig = plt.figure(1)
ax = fig.add_subplot(111)
ax.plot(all_x, all_y)

# Add legend, title and axis labels
lgd = ax.legend( [ 'Lag ' + str(lag) for lag in all_x], loc='center right',
bbox_to_anchor=(1.3, 0.5))
ax.set_title('Title')
ax.set_xlabel('x label')
ax.set_ylabel('y label')

fig.savefig('image_output.png', dpi=300, format='png')
```

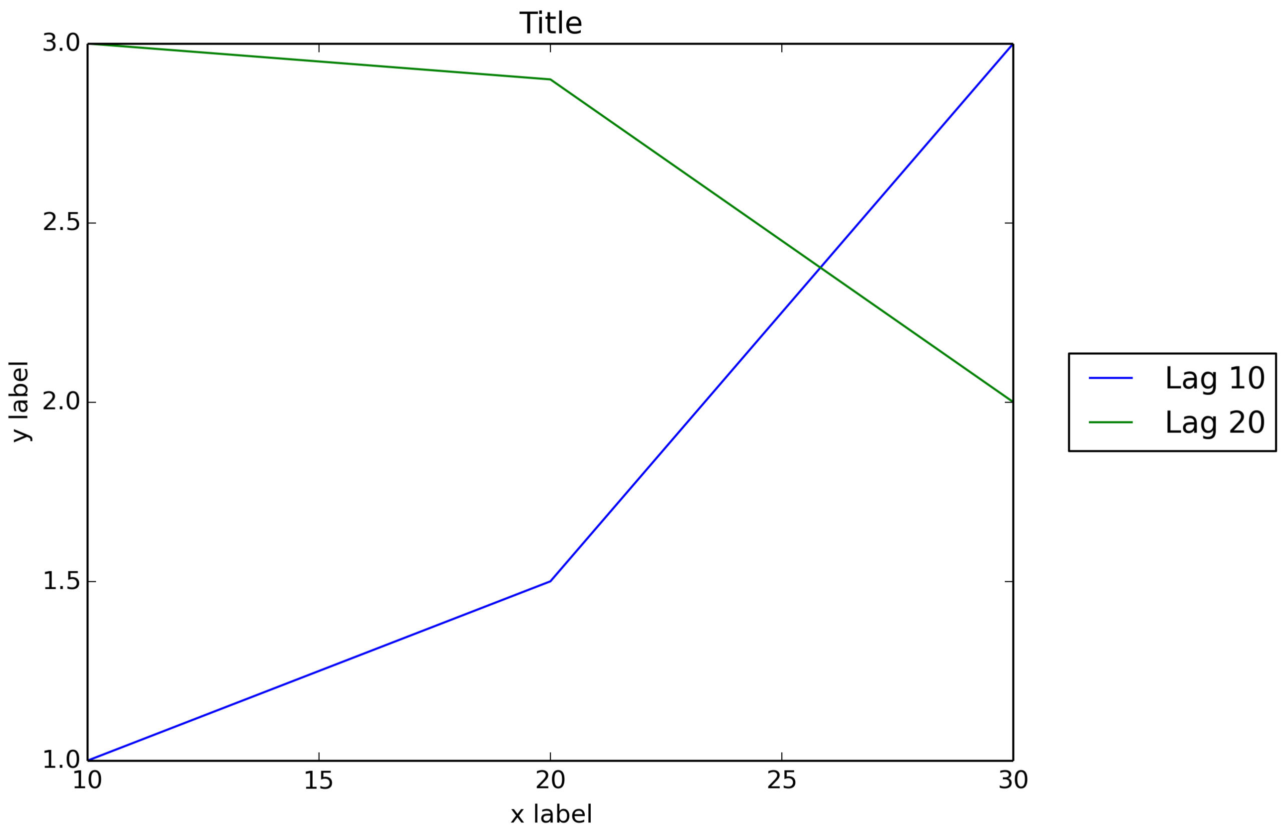


In order to prevent the legend box from getting cropped, when you save the figure you can use the parameters `bbox_extra_artists` and `bbox_inches` to ask `savefig` to include cropped elements in the saved image:

```
fig.savefig('image_output.png', bbox_extra_artists=(lgd,), bbox_inches='tight')
```

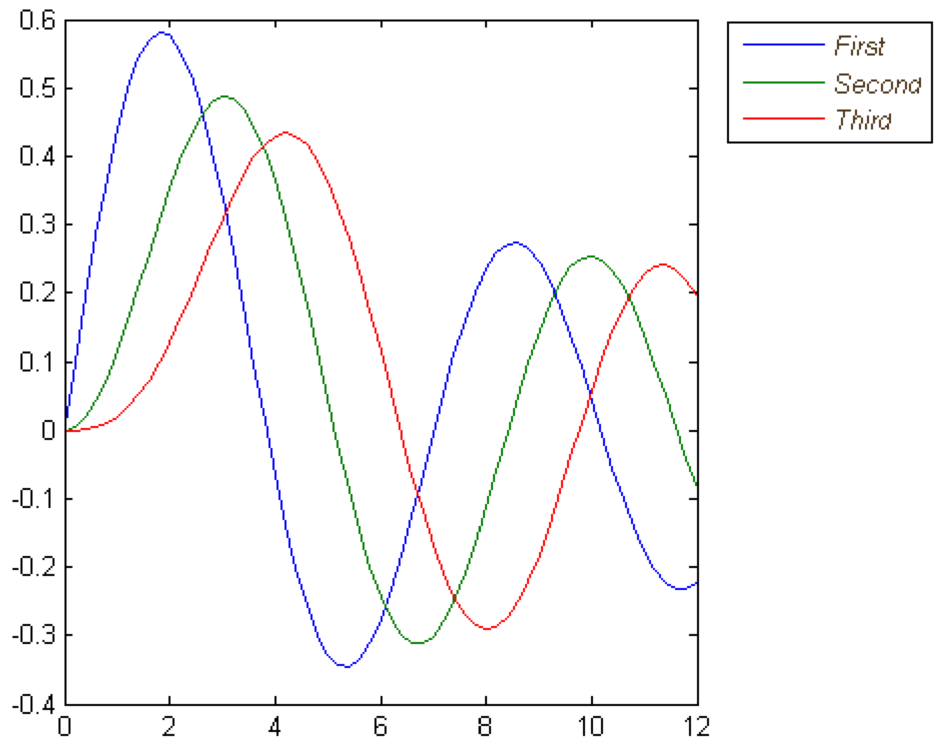
Example (I only changed the last line to add 2 parameters to `fig.savefig()`):

```
import matplotlib.pyplot as plt

# data
all_x = [10,20,30]
all_y = [[1,3], [1.5,2.9],[3,2]]

# Plot
fig = plt.figure(1)
ax = fig.add_subplot(111)
ax.plot(all_x, all_y)

# Add legend, title and axis labels
lgd = ax.legend( [ 'Lag ' + str(lag) for lag in all_x], loc='center right',
bbox_to_anchor=(1.3, 0.5))
ax.set_title('Title')
ax.set_xlabel('x label')
ax.set_ylabel('y label')
```



I wish that matplotlib would natively allow outside location for the legend box as Matlab does:

```
figure
x = 0:.2:12;
plot(x,besselj(1,x),x,besselj(2,x),x,besselj(3,x));
hleg = legend('First','Second','Third',...
              'Location','NorthEastOutside')
% Make the text of the legend italic and color it brown
set(hleg,'FontAngle','italic','TextColor',[.3,.2,.1])
```



edited Aug 16 '14 at 22:55

answered Aug 16 '14 at 22:49
Franck Dernoncourt
58.9k 56 276 433

6 Thank you so much! The "bbox_to_anchor", "bbox_extra_artist" and ""bbox_inches='tight" parameters were exactly what I needed to make it work correctly. Awesome! – Demitrian Aug 31 '14 at 14:04

6 Thank you, but actually `bbox_inches='tight'` works perfectly for me even without bbox_extra_artist – avtomaton Nov 8 '16 at 5:16

1 @avtomaton Thanks, good to know, which version of matplotlib do you use? – Franck Dernoncourt Nov 8 '16 at 17:28

1 @FranckDernoncourt python3, matplotlib version 1.5.3 – avtomaton Nov 9 '16 at 4:49

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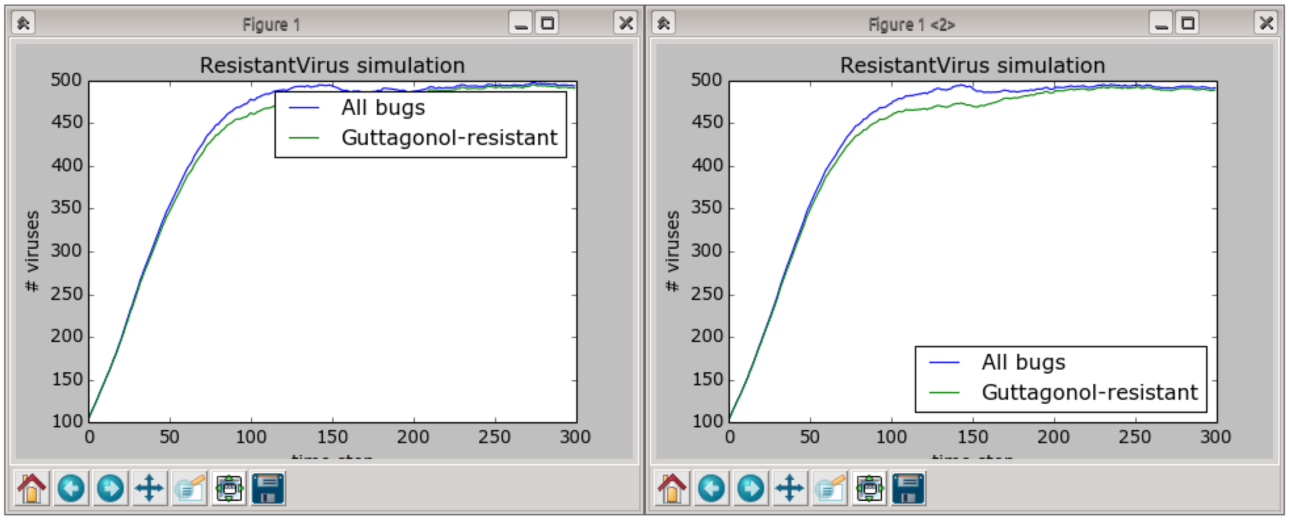
In addition to all the excellent answers here, newer versions of `matplotlib` and `pylab` can **automatically determine where to put the legend without interfering with the plots**, if possible.

```
pylab.legend(loc='best')
```

This will automatically place the legend away from the data if possible!

Without loc='best': **With loc='best':**



However, if there is no place to put the legend without overlapping the data, then you'll want to try one of the other answers; using `loc="best"` will never put the legend *outside* of the plot.

edited Mar 4 '19 at 23:49
ntc2
9,220 3 43 62

answered Dec 8 '14 at 9:46
dotancohen
25.4k 27 118 173

2 Thank you for pointing this out! I looked for this a few years back and didn't find it, and it something that really makes my live easier. – Edgar H Aug 23 '15 at 10:37

4 this option is helpful but does not answer the question so i downvoted. as far as i can tell, best never puts the legend outside of the plot – Tommy Sep 9 '15 at 12:01

3 @Tommy: In the OP's comments (which seems to be gone now) it was explicitly clarified that the OP wanted the legend to not cover the graph data, and he thought that outside the plot was the only way to do that. You can see this in the answers from mefathy, Mateo Sanchez, Bastiaan, and radtek. The OP asked for X, but he wanted Y. – dotancohen Sep 9 '15 at 13:19

1 Actually, not. He/she specifically asked for the legend to be outside the plot. It's in the name of the question ;) "How to put the legend out of the plot". – durbachit Aug 30 '16 at 3:09

4 This does not guarantee that the legend does not obscure the data. Just make a very dense plot -- there is no place to put the legend. For example, try this... from numpy import arange, sin, pi import matplotlib.pyplot as plt t = arange(0.0, 100.0, 0.01) fig = plt.figure(1) ax1 = fig.add_subplot(211) ax1.scatter(t, sin(2*pi*t),label='test') ax1.grid(True) # ax1.set_ylim((-2, 2)) ax1.set_ylabel('1 Hz') ax1.set_title('A sine wave or two') for label in ax1.get_xticklabels(): label.set_color('r') plt.legend(loc='best') plt.show() – adam.r Feb 8 '18 at 16:34

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Short Answer: Invoke draggable on the legend and interactively move it wherever you want:

```
ax.legend().draggable()
```

wherever you want. Check the example below:

```
import matplotlib.pylab as plt
import numpy as np
#define the figure and get an axes instance
fig = plt.figure()
ax = fig.add_subplot(111)
#plot the data
x = np.arange(-5, 6)
ax.plot(x, x*x, label='y = x^2')
ax.plot(x, x*x*x, label='y = x^3')
ax.legend().draggable()
plt.show()
```

edited Feb 9 '16 at 17:01

answered Feb 20 '13 at 19:41
mefathy
751 5 10

Not sure I understand this fully. How do I "drag" the legend to wherever I want with this? I am using Python 3.6 and Jupyter Notebook – sb2020 Dec 25 '19 at 20:52

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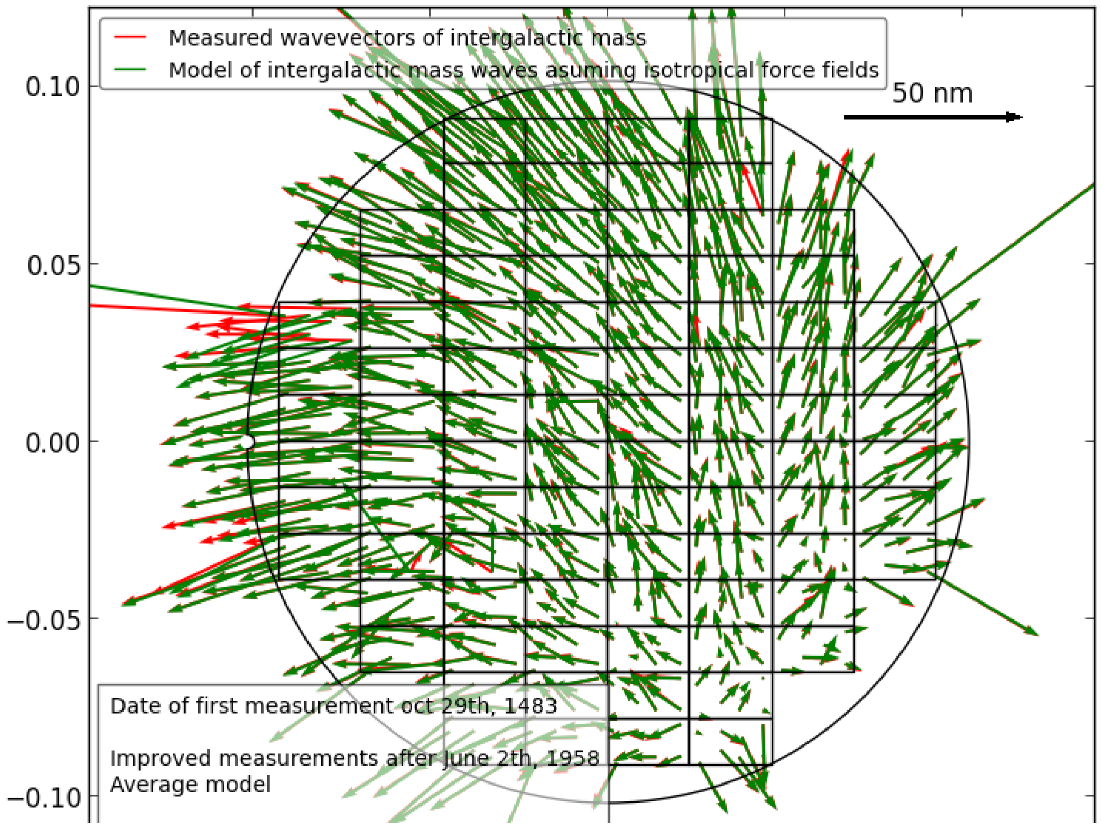
Not exactly what you asked for, but I found it's an alternative for the same problem. Make the legend semi-transparant, like so:



Do this with:

```
fig = pylab.figure()
ax = fig.add_subplot(111)
ax.plot(x,y,label=label,color=color)
# Make the legend transparent:
ax.legend(loc=2,fontsize=10,fancybox=True).get_frame().set_alpha(0.5)
# Make a transparent text box
ax.text(0.02,0.02,yourstring, verticalalignment='bottom',
                     horizontalalignment='left',
                     fontsize=10,
                     bbox={'facecolor':'white', 'alpha':0.6, 'pad':10},
                     transform=self.ax.transAxes)
```

answered Apr 17 '14 at 17:27
Bastiaan
3,471 2 19 26

9

As noted, you could also place the legend in the plot, or slightly off it to the edge as well. Here is an example using the Plotly Python API, made with an IPython Notebook. I'm on the team.

To begin, you'll want to install the necessary packages:

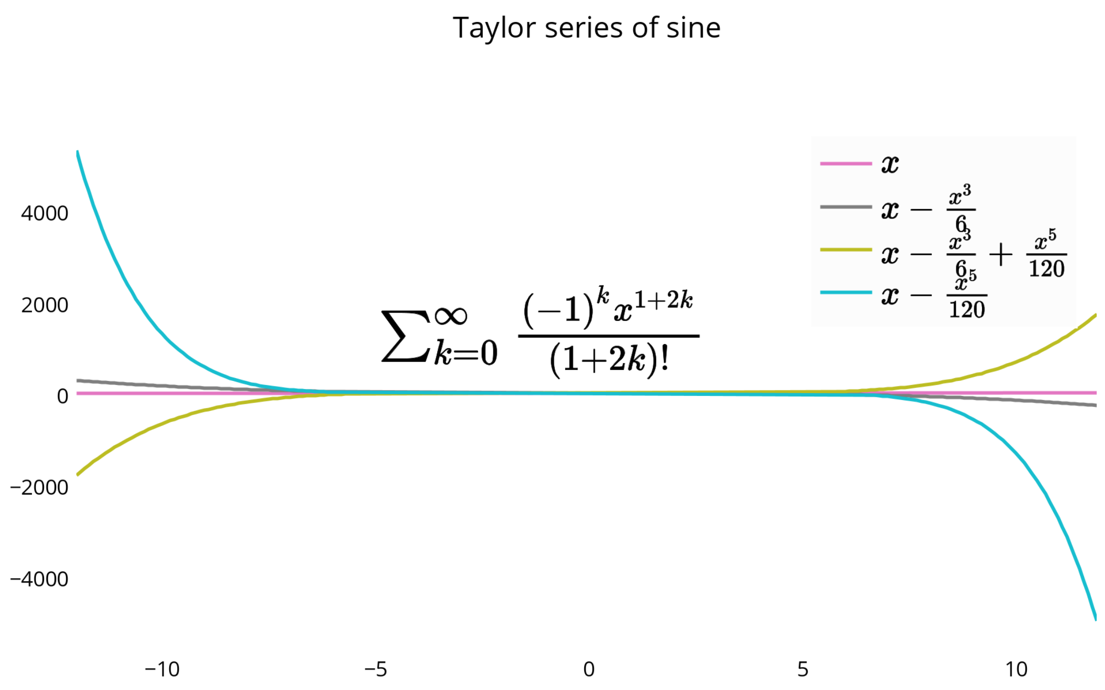
```
import plotly
import math
import random
import numpy as np
```

Then, install Plotly:

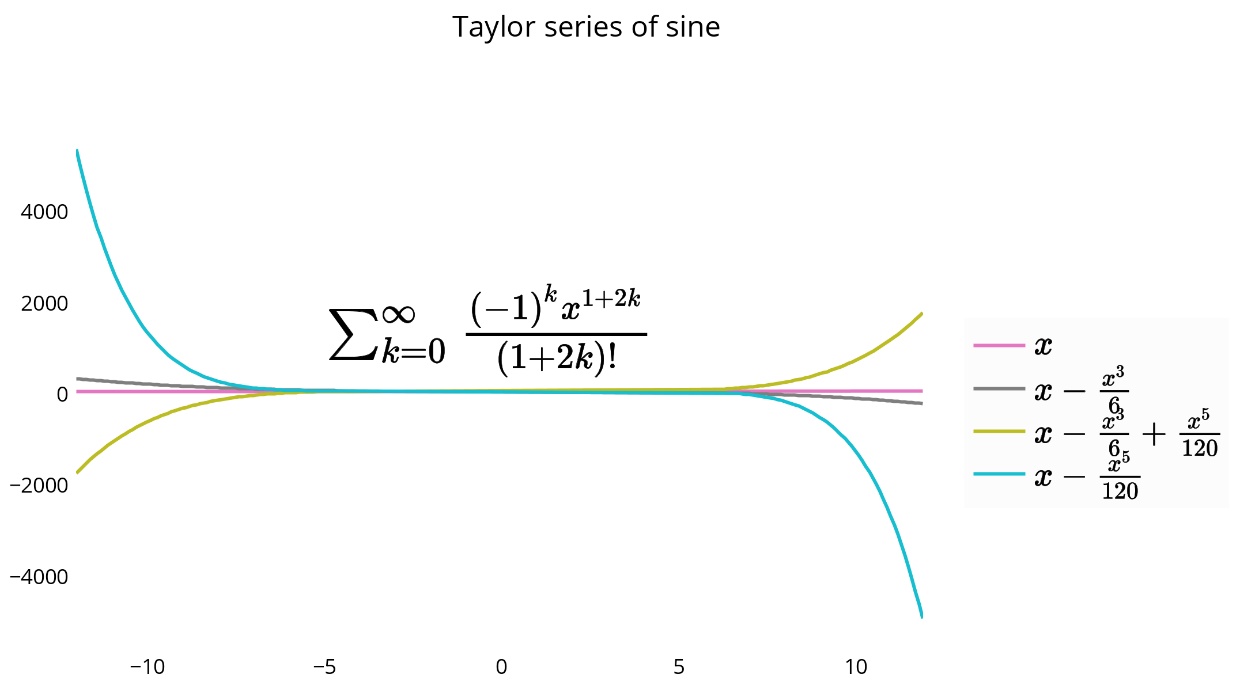
```
un='IPython.Demo'
k='1fw3zw2o13'
py = plotly.plotly(username=un, key=k)


def sin(x,n):
sine = 0
for i in range(n):
    sign = (-1)**i
    sine = sine + ((x**(2.0*i+1))/math.factorial(2*i+1))*sign
return sine

x = np.arange(-12,12,0.1)

anno = {
'text': '$\\sum_{k=0}^{\\infty} \\frac {(-1)^k x^{1+2k}}{(1 + 2k)!}$',
'x': 0.3, 'y': 0.6,'xref': "paper", 'yref': "paper",'showarrow': False,
'font':{'size':24}
}

l = {
```

```
'legend':{'font':{'size':16},'bordercolor':'white','bgcolor':'#fcfcfc'}
}

py.iplot([{'x':x, 'y':sin(x,1), 'line':{'color':'#e377c2'}, 'name':'$x\\\\$'},\
      {'x':x, 'y':sin(x,2), 'line':{'color':'#7f7f7f'},'name':'$ x-\\frac{x^3}{6}$'},\
      {'x':x, 'y':sin(x,3), 'line':{'color':'#bcbd22'},'name':'$ x-\\frac{x^3}
{6}+\\frac{x^5}{120}$'},\
      {'x':x, 'y':sin(x,4), 'line':{'color':'#17becf'},'name':'$ x-\\frac{x^5}
{120}$'}], layout=l)
```

This creates your graph, and allows you a chance to keep the legend within the plot itself. The default for the legend if it is not set is to place it in the plot, as shown here.



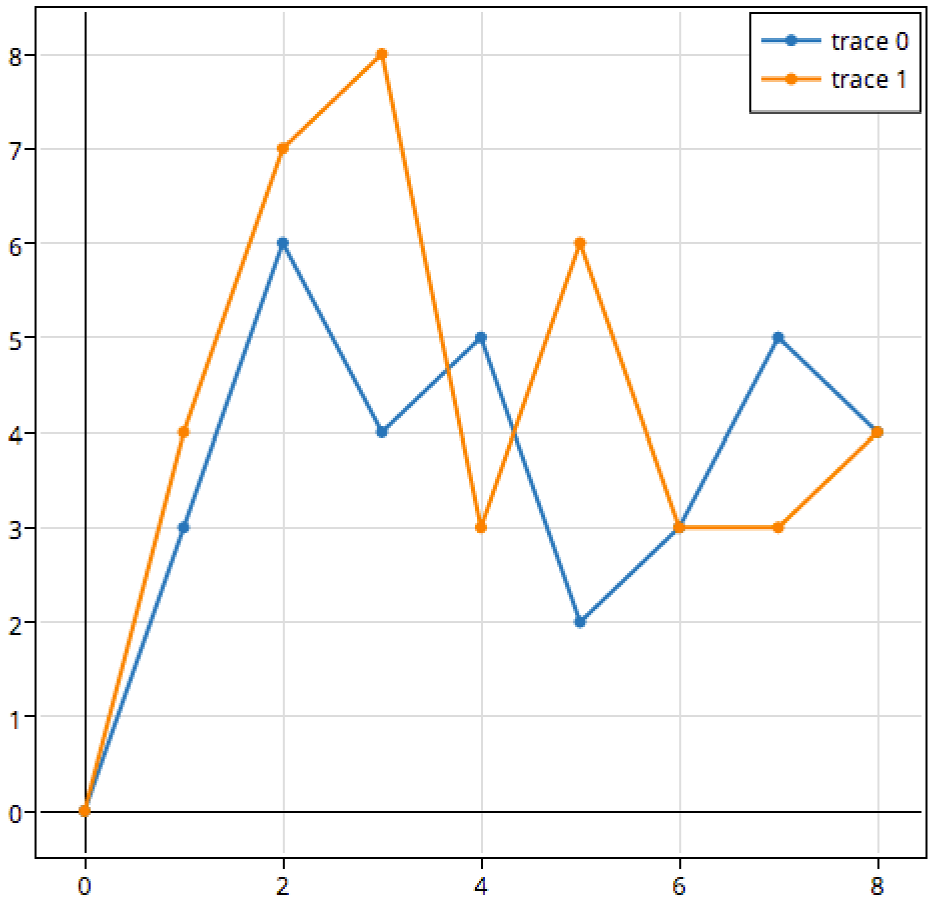
For an alternative placement, you can closely align the edge of the graph and border of the legend, and remove border lines for a closer fit.



You can move and re-style the legend and graph with code, or with the GUI. To shift the legend, you have the following options to position the legend inside the graph by assigning x and y values of <= 1. E.g :

- `{"x" : 0,"y" : 0}` -- Bottom Left
- `{"x" : 1, "y" : 0}` -- Bottom Right
- `{"x" : 1, "y" : 1}` -- Top Right
- `{"x" : 0, "y" : 1}` -- Top Left
- `{"x" :.5, "y" : 0}` -- Bottom Center
- `{"x": .5, "y" : 1}` -- Top Center

In this case, we choose the upper right, `legendstyle = {"x" : 1, "y" : 1}` , also described in the documentation:



answered Feb 9 '14 at 13:55
Mateo Sanchez
1,449 13 16

Oooh... pretty colors (in the first plot). – Mateen Ulhaq Jun 11 at 5:39

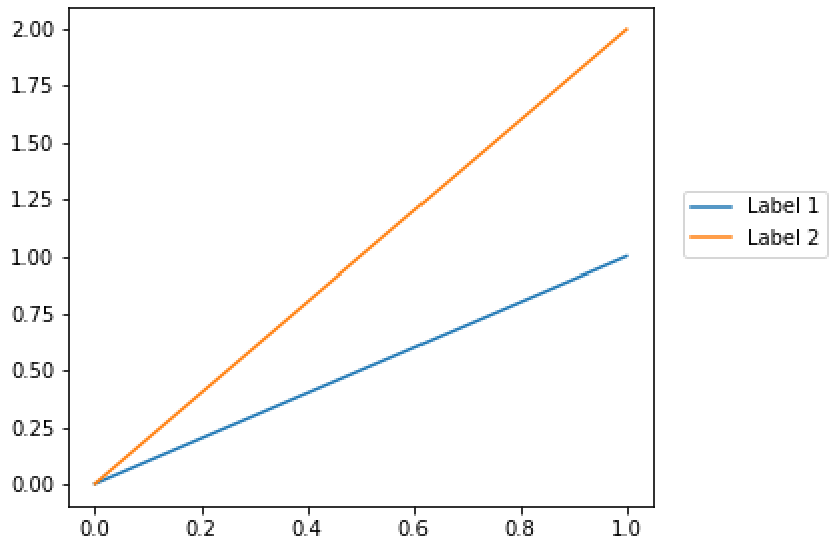
7

It's worth refreshing this question, as newer versions of Matplotlib have made it much easier to position the legend outside the plot. I produced this example with Matplotlib version `3.1.1` .

Users can pass a 2-tuple of coordinates to the `loc` parameter to position the legend anywhere in the bounding box. The only gotcha is you need to run `plt.tight_layout()` to get matplotlib to recompute the plot dimensions so the legend is visible:

```
import matplotlib.pyplot as plt

plt.plot([0, 1], [0, 1], label="Label 1")
plt.plot([0, 1], [0, 2], label='Label 2')

plt.legend(loc=(1.05, 0.5))
```

This leads to the following plot:



References:

- https://matplotlib.org/api/_as_gen/matplotlib.pyplot.legend.html
- https://showmecode.info/matplotlib/legend/reposition-legend/ (personal site)

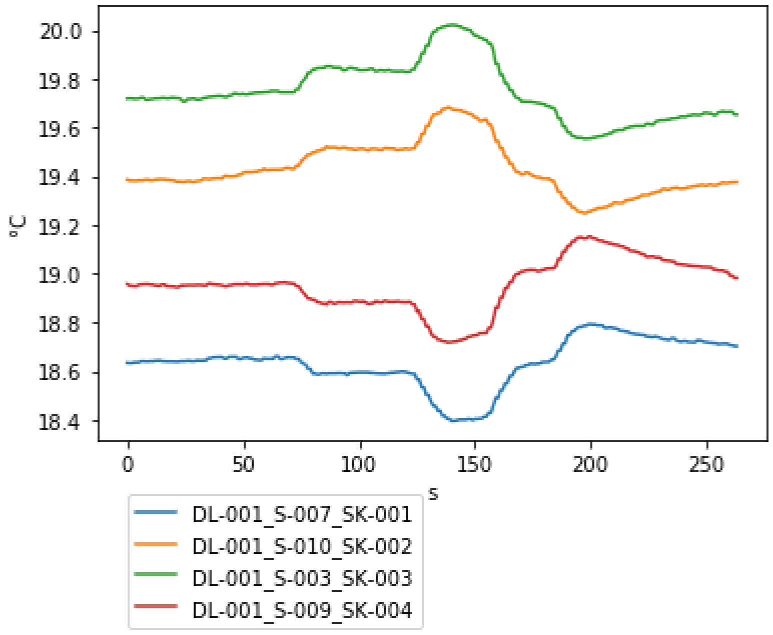
answered Apr 5 at 22:16
luc
356 1 5

7

I simply used the string `'center left'` for the location, like in matlab. I imported pylab from matplotlib.

see the code as follow:

```
from matplotlib as plt
from matplotlib.font_manager import FontProperties
t = A[:,0]
sensors = A[:,index_lst]

for i in range(sensors.shape[1]):
    plt.plot(t,sensors[:,i])

plt.xlabel('s')
plt.ylabel('°C')
lgd = plt.legend(loc='center left', bbox_to_anchor=(1, 0.5),fancybox = True, shadow =
True)
```



edited Dec 11 at 17:12
Trenton McKinney
22.5k 14 35 52

answered Mar 15 '17 at 9:31
Ziuccia
81 1 3

3

Something along these lines worked for me. Starting with a bit of code taken from Joe, this method modifies the window width to automatically fit a legend to the right of the figure.

```
import matplotlib.pyplot as plt
import numpy as np

plt.ion()

x = np.arange(10)

fig = plt.figure()
ax = plt.subplot(111)

for i in xrange(5):
    ax.plot(x, i * x, label='$y = %ix$'%i)

# Put a legend to the right of the current axis
leg = ax.legend(loc='center left', bbox_to_anchor=(1, 0.5))

plt.draw()

# Get the ax dimensions.
box = ax.get_position()
xlocs = (box.x0,box.x1)
ylocs = (box.y0,box.y1)

# Get the figure size in inches and the dpi.
w, h = fig.get_size_inches()
dpi = fig.get_dpi()
```

```
fig.set_size_inches(winWidthNew/dpi,h)

# Adjust the window size to fit the figure.
mgr = plt.get_current_fig_manager()
mgr.window.wm_geometry("%ix%i"%(winWidthNew,mgr.window.winfo_height()))

# Rescale the ax to keep its original size.
factor = w*dpi/winWidthNew
x0 = xlocs[0]*factor
x1 = xlocs[1]*factor
width = box.width*factor
ax.set_position([x0,ylocs[0],x1-x0,ylocs[1]-ylocs[0]])

plt.draw()
```

answered Dec 21 '13 at 0:38
Martin
31 1

I found this quite useful and it worked for me. Note that if you're in the wx backend (e.g. using windows), replace mgr.window.wm_geometry("%ix%i"%(winWidthNew,mgr.window.winfo_height())) with mgr.window.SetClientSizeWH(winWidthNew,winHeightNew) or the like – Ezekiel Kruglick Feb 18 '14 at 21:21

If you're using the Qt4Agg backend (which is default on my Linux installation of matplotlib), then replace the line `mgr.window.wm_geometry(...)` with `mgr.window.setFixedWidth(winWidthNew)` . – Filip S. Apr 30 '14 at 6:47

And, as I just discovered, if you're using a backend that doesn't show any windows, that are meant for saving straight to a file (like the SVG and AGG backends), just skip the window resizing altogether. `fig.set_size_inches(...)` takes care of the resizing you need. – Filip S. Apr 30 '14 at 6:55

2

You can also try `figlegend` . It is possible to create a legend independent of any Axes object. However, you may need to create some "dummy" Paths to make sure the formatting for the objects gets passed on correctly.

answered Jan 17 '11 at 7:06
Uri Laserson
2,043 4 25 38

1

Here is an example from the matplotlib tutorial found [here](). This is one of the more simpler examples but I added transparency to the legend and added plt.show() so you can paste this into the interactive shell and get a result:

```
import matplotlib.pyplot as plt
p1, = plt.plot([1, 2, 3])
p2, = plt.plot([3, 2, 1])
p3, = plt.plot([2, 3, 1])
plt.legend([p2, p1, p3], ["line 1", "line 2", "line 3"]).get_frame().set_alpha(0.5)
```

answered Jun 10 '14 at 17:13

radtek
24.5k 8 122 94

1

The solution that worked for me when I had huge legend was to use extra empty image layout. In following example I made 4 rows and at the bottom I plot image with offset for legend (bbox_to_anchor) at the top it does not get cut.

```
f = plt.figure()
ax = f.add_subplot(414)
lgd = ax.legend(loc='upper left', bbox_to_anchor=(0, 4), mode="expand",
borderaxespad=0.3)
ax.autoscale_view()
plt.savefig(fig_name, format='svg', dpi=1200, bbox_extra_artists=(lgd,),
bbox_inches='tight')
```

answered Aug 28 '16 at 17:04

Crystal
227 2 11

1

Here's another solution, similar to adding `bbox_extra_artists` and `bbox_inches` , where you don't have to have your extra artists in the scope of your `savefig` call. I came up with this since I generate most of my plot inside functions.

Instead of adding all your additions to the bounding box when you want to write it out, you can add them ahead of time to the `Figure` 's artists. Using something similar to Franck Dernoncourt's [answer above](#):

```
import matplotlib.pyplot as plt

# data
all_x = [10,20,30]
all_y = [[1,3], [1.5,2.9],[3,2]]

# plotting function
def gen_plot(x, y):
    fig = plt.figure(1)
    ax = fig.add_subplot(111)
    ax.plot(all_x, all_y)
    lgd = ax.legend( [ "Lag " + str(lag) for lag in all_x], loc="center right",
bbox_to_anchor=(1.3, 0.5))
    fig.artists.append(lgd) # Here's the change
    ax.set_title("Title")
    ax.set_xlabel("x label")
    ax.set_ylabel("y label")
    return fig

# plotting
fig = gen_plot(all_x, all_y)
```

Here's the generated plot.

edited May 23 '17 at 12:02
Community ♦
1 1

answered Jan 27 '17 at 8:03
ivirshup
342 2 5

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