Python for Data Science

Categorical Plots

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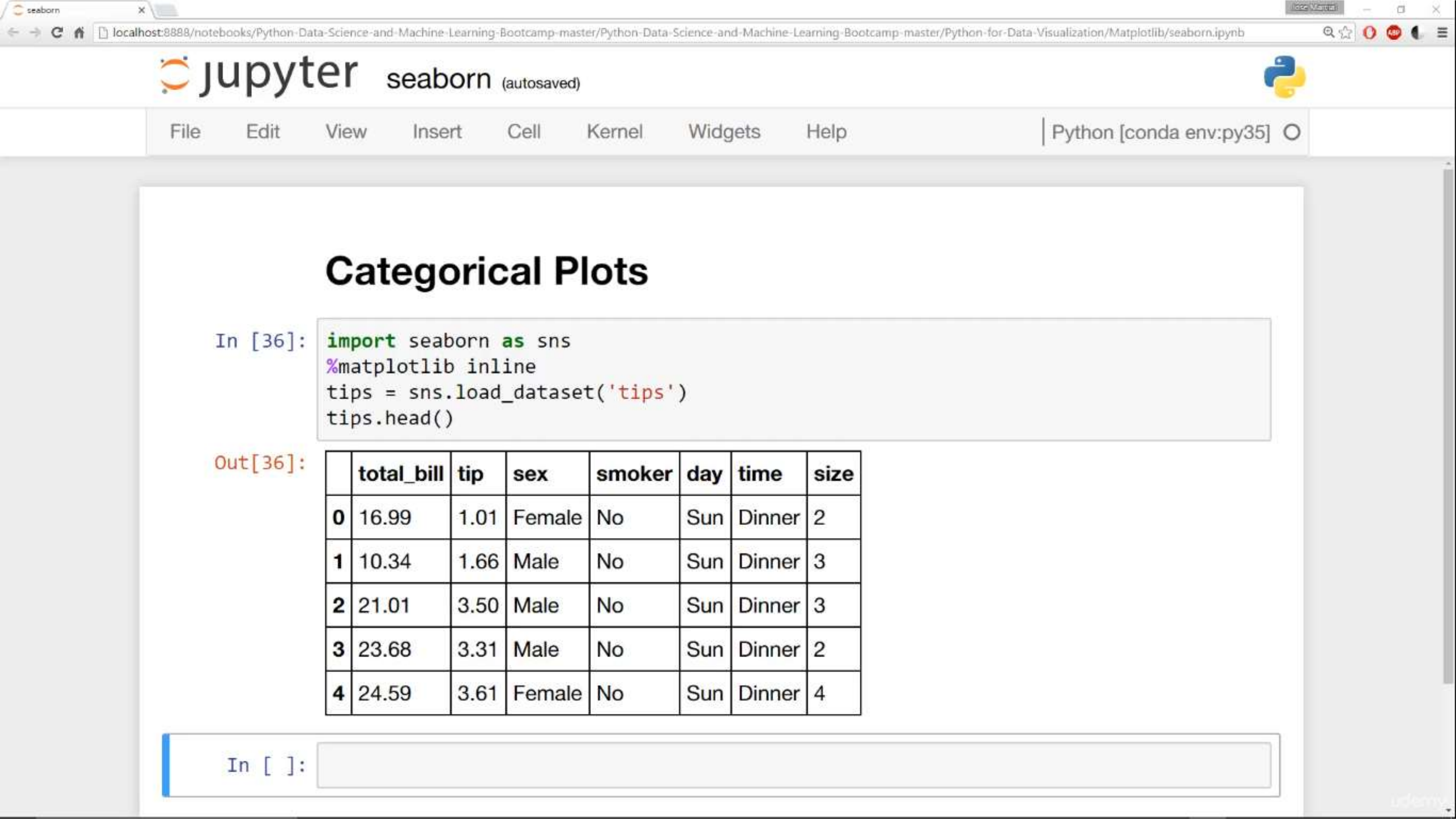
seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
jupyter
seaborn (autosaved)
File
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View
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Kernel
Widgets
Help
Python [conda env:py35]

Categorical Plots

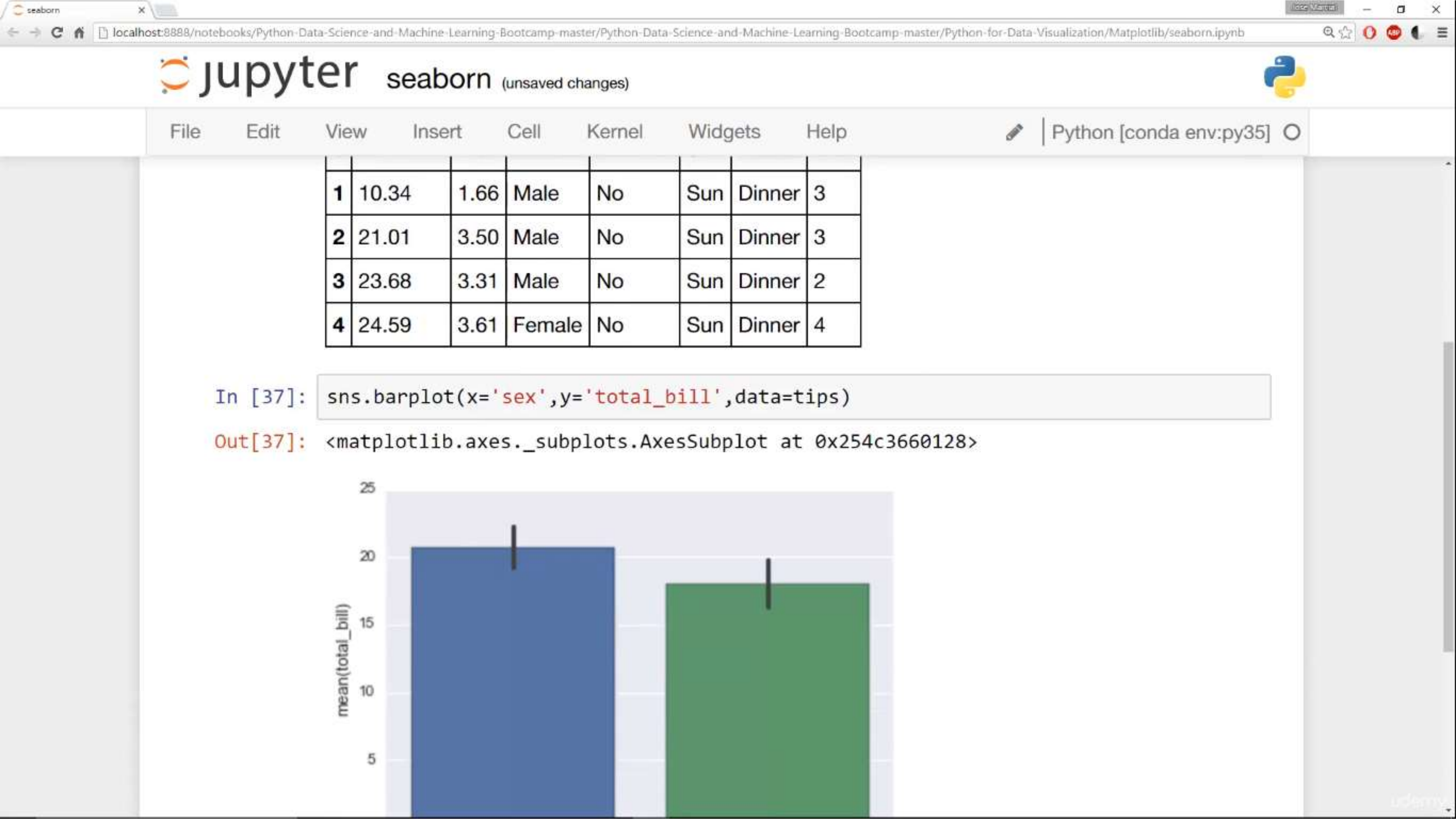
In [36]:

```
import seaborn as sns
%matplotlib inline
tips = sns.load_dataset('tips')
tips.head()
```

Out[36]:

	total_bill	tip	sex	smoker	day	time	size
0	16.99	1.01	Female	No	Sun	Dinner	2
1	10.34	1.66	Male	No	Sun	Dinner	3
2	21.01	3.50	Male	No	Sun	Dinner	3
3	23.68	3.31	Male	No	Sun	Dinner	2
4	24.59	3.61	Female	No	Sun	Dinner	4

In [ ]:


seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
jupyter
seaborn (unsaved changes)
File
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Kernel
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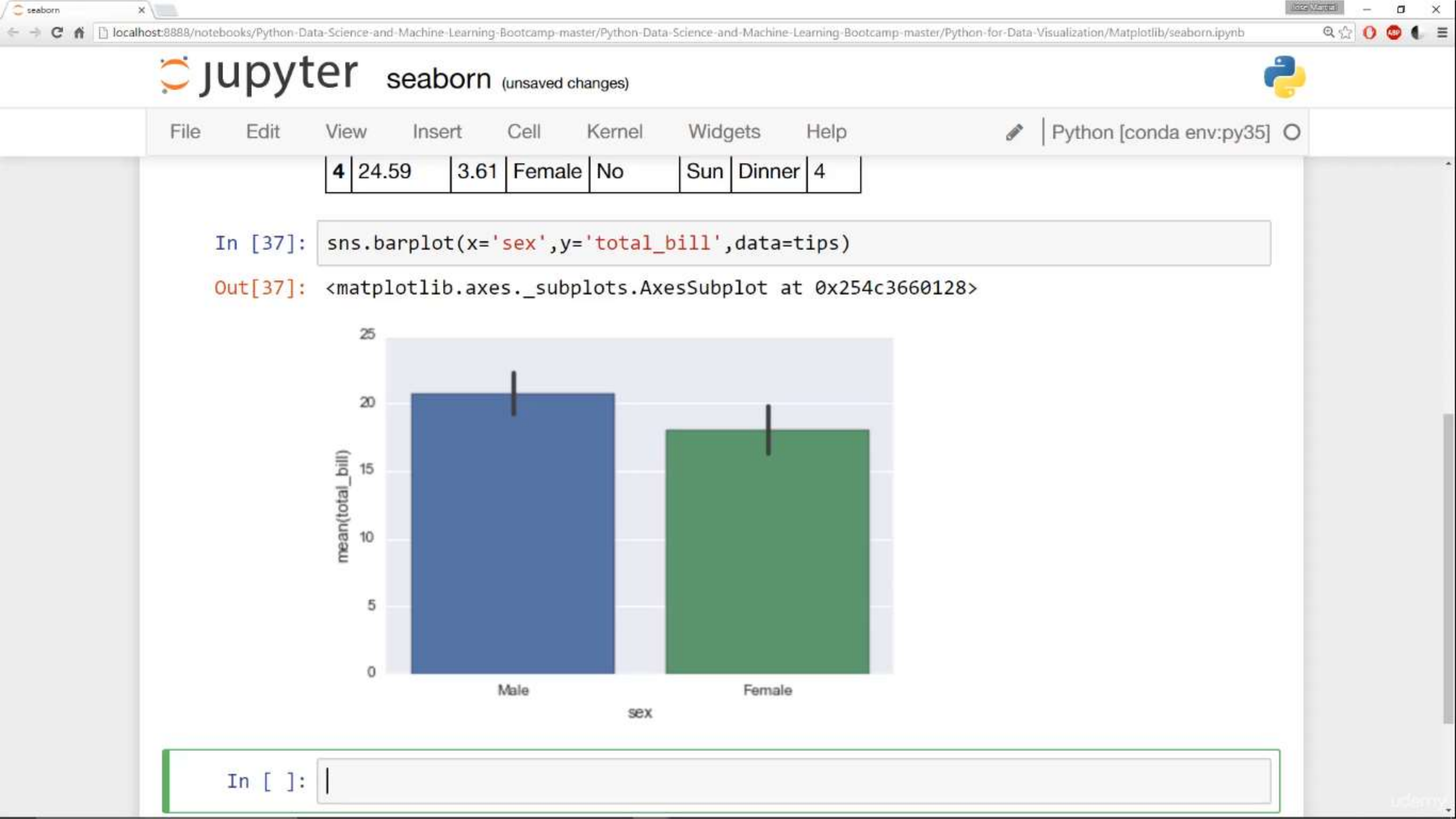
Help
Python [conda env:py35]

1	10.34	1.66	Male	No	Sun	Dinner	3
2	21.01	3.50	Male	No	Sun	Dinner	3
3	23.68	3.31	Male	No	Sun	Dinner	2
4	24.59	3.61	Female	No	Sun	Dinner	4

```
In [37]: sns.barplot(x='sex',y='total_bill',data=tips)
```

```
Out[37]: <matplotlib.axes._subplots.AxesSubplot at 0x254c3660128>
```

25
20
15
10
5
mean(total_bill)



seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
jupyter
seaborn (unsaved changes)
File
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Cell
Kernel
Widgets
Help
Python [conda env:py35]

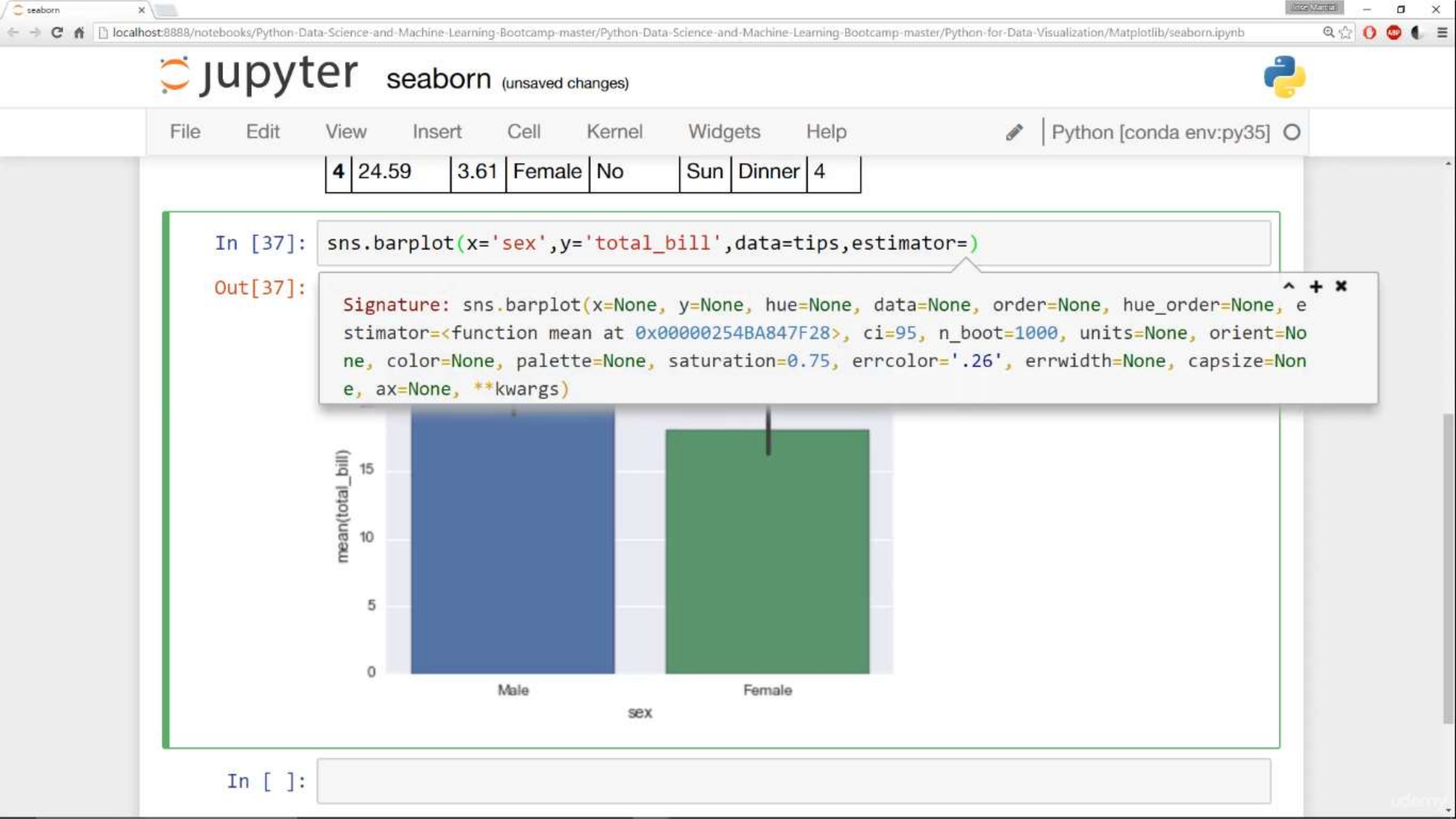
4	24.59	3.61	Female	No	Sun	Dinner	4

```
In [37]: sns.barplot(x='sex',y='total_bill',data=tips)
```

```
Out[37]: <matplotlib.axes._subplots.AxesSubplot at 0x254c3660128>
```

25
20
15
10
5
0
mean(total_bill)
Male
Female
sex

```
In [ ]:
```



seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
jupyter
seaborn (unsaved changes)
File
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Cell
Kernel
Widgets
Help
Python [conda env:py35]
mean(total_bill)
15
10
5
0
Male
Female
sex

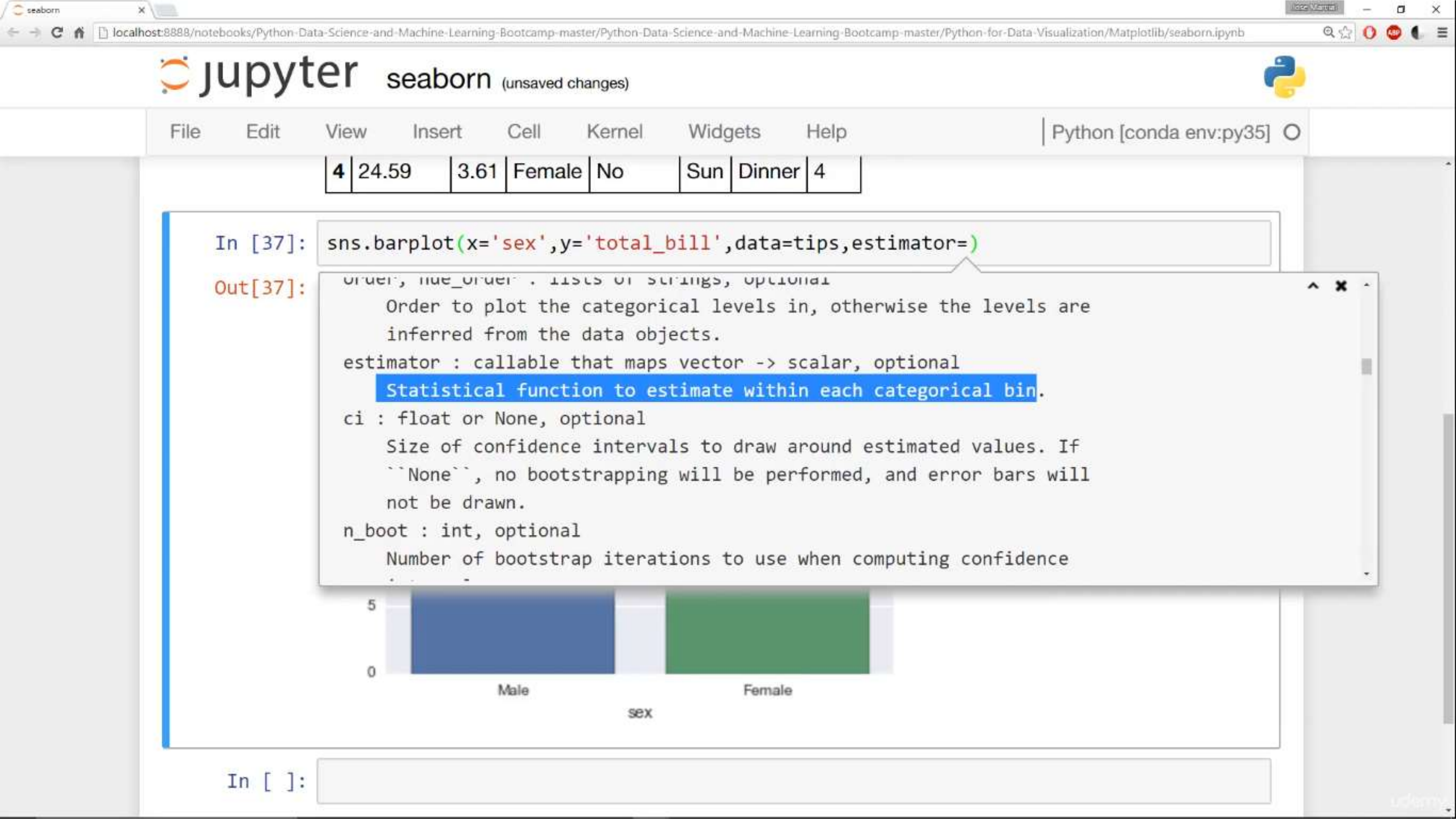
4	24.59	3.61	Female	No	Sun	Dinner	4

```
In [37]: sns.barplot(x='sex',y='total_bill',data=tips,estimator=)
```

```
Out[37]:
```

```
Signature: sns.barplot(x=None, y=None, hue=None, data=None, order=None, hue_order=None, e
stimator=<function mean at 0x00000254BA847F28>, ci=95, n_boot=1000, units=None, orient=No
ne, color=None, palette=None, saturation=0.75, errcolor='.26', errwidth=None, capsize=Non
e, ax=None, **kwargs)
```

```
In [ ]:
```

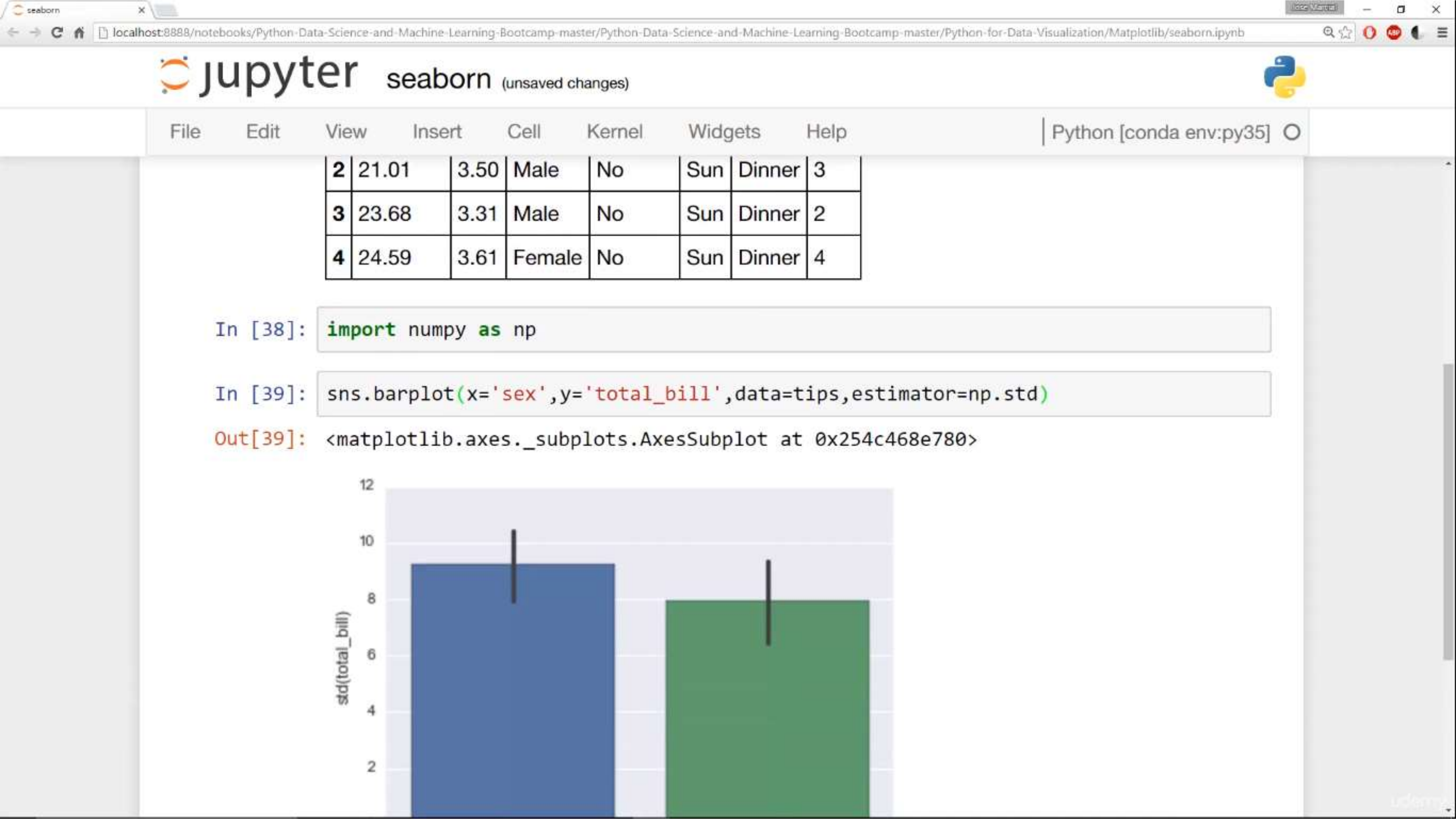

seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
jupyter
seaborn (unsaved changes)
File
Edit
View
Insert
Cell
Kernel
Widgets
Help
Python [conda env:py35]
5
0
Male
Female
sex

4	24.59	3.61	Female	No	Sun	Dinner	4

```
In [37]: sns.barplot(x='sex',y='total_bill',data=tips,estimator=)
```

```
Out[37]:
order, hue_order : lists of strings, optional
    Order to plot the categorical levels in, otherwise the levels are
    inferred from the data objects.
estimator : callable that maps vector -> scalar, optional
    Statistical function to estimate within each categorical bin.
ci : float or None, optional
    Size of confidence intervals to draw around estimated values. If
    ``None``, no bootstrapping will be performed, and error bars will
    not be drawn.
n_boot : int, optional
    Number of bootstrap iterations to use when computing confidence
    intervals.
```

```
In [ ]:
```



seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
jupyter
seaborn (unsaved changes)
File
Edit
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Kernel
Widgets
Help
Python [conda env:py35]

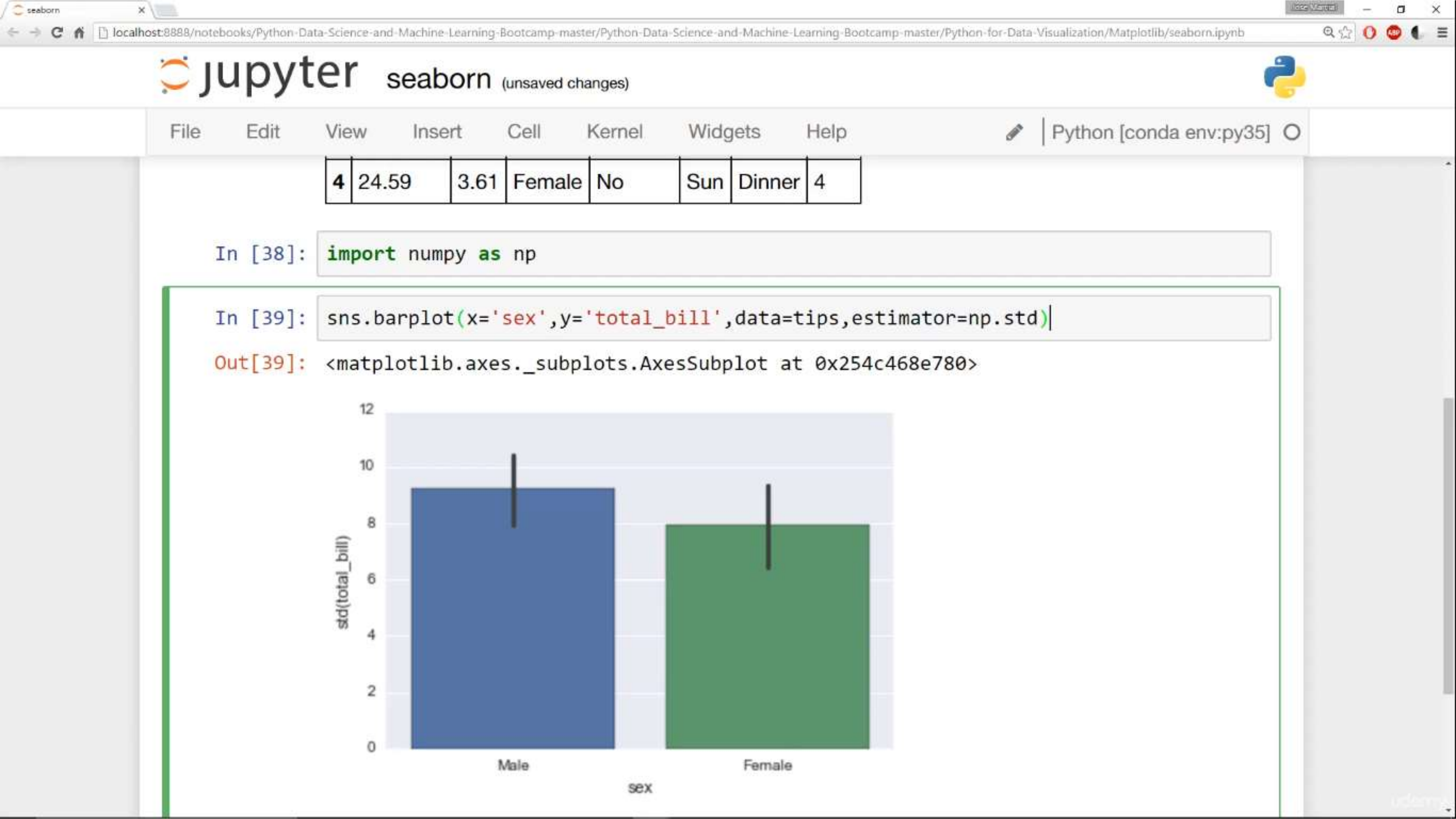
2	21.01	3.50	Male	No	Sun	Dinner	3
3	23.68	3.31	Male	No	Sun	Dinner	2
4	24.59	3.61	Female	No	Sun	Dinner	4

```
In [38]: import numpy as np
```

```
In [39]: sns.barplot(x='sex',y='total_bill',data=tips,estimator=np.std)
```

```
Out[39]: <matplotlib.axes._subplots.AxesSubplot at 0x254c468e780>
```

12
10
8
6
4
2
std(total_bill)


seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
jupyter
seaborn (unsaved changes)
File
Edit
View
Insert
Cell
Kernel
Widgets
Help
Python [conda env:py35]

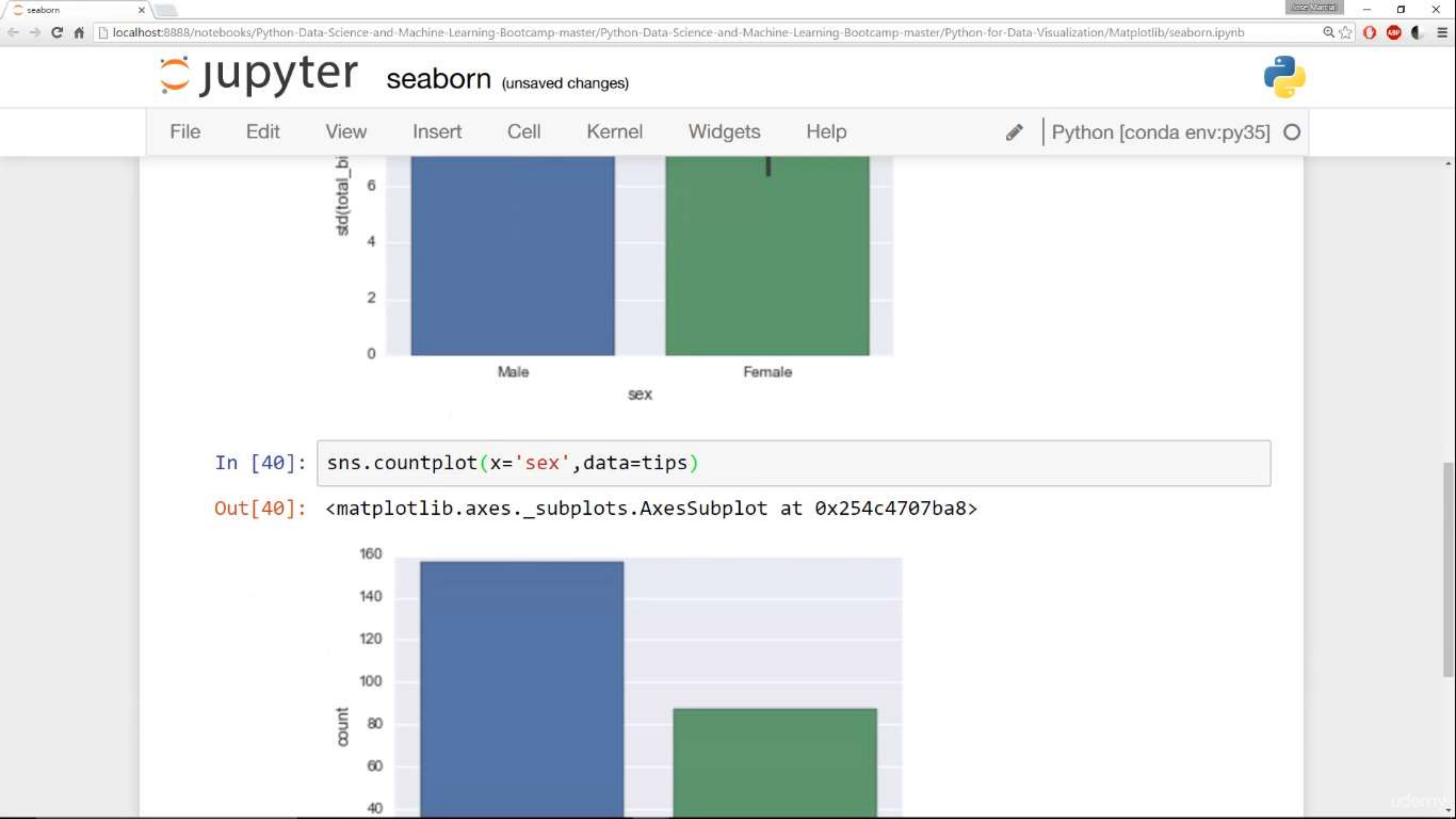
4	24.59	3.61	Female	No	Sun	Dinner	4

In [38]:
```
import numpy as np
```

In [39]:
```
sns.barplot(x='sex',y='total_bill',data=tips,estimator=np.std)
```

Out[39]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x254c468e780>
```

12
10
8
6
4
2
0
std(total_bill)
Male
Female
sex


seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
jupyter
seaborn (unsaved changes)
File
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Insert
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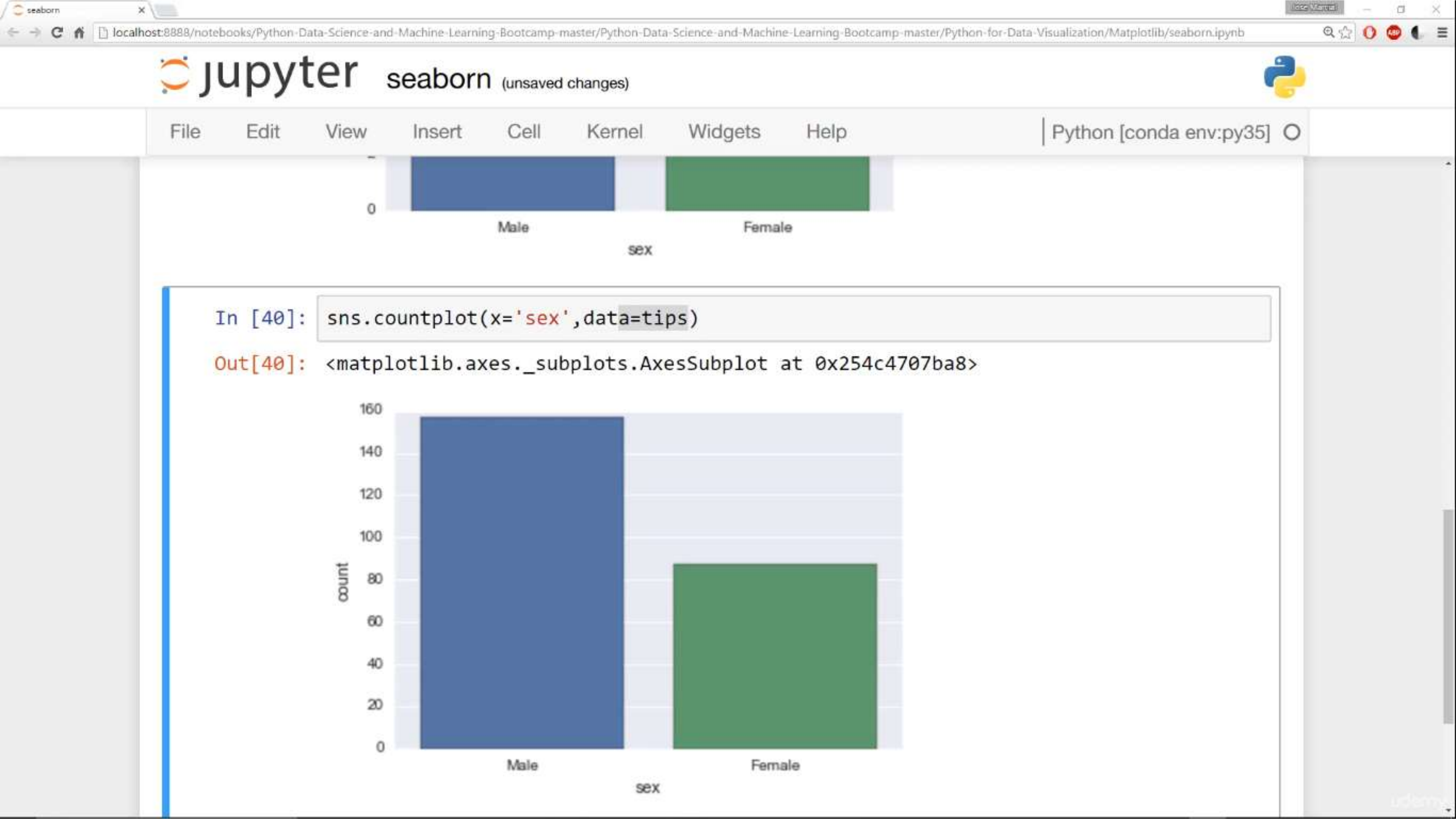
Kernel
Widgets
Help
Python [conda env:py35]
std(total_bi
6
4
2
0
Male
Female
sex

In [40]:
```
sns.countplot(x='sex',data=tips)
```

Out[40]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x254c4707ba8>
```

160
140
120
100
80
60
40
count


seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
jupyter
seaborn (unsaved changes)
File
Edit
View
Insert
Cell
Kernel
Widgets
Help
Python [conda env:py35]
0
Male
Female
sex

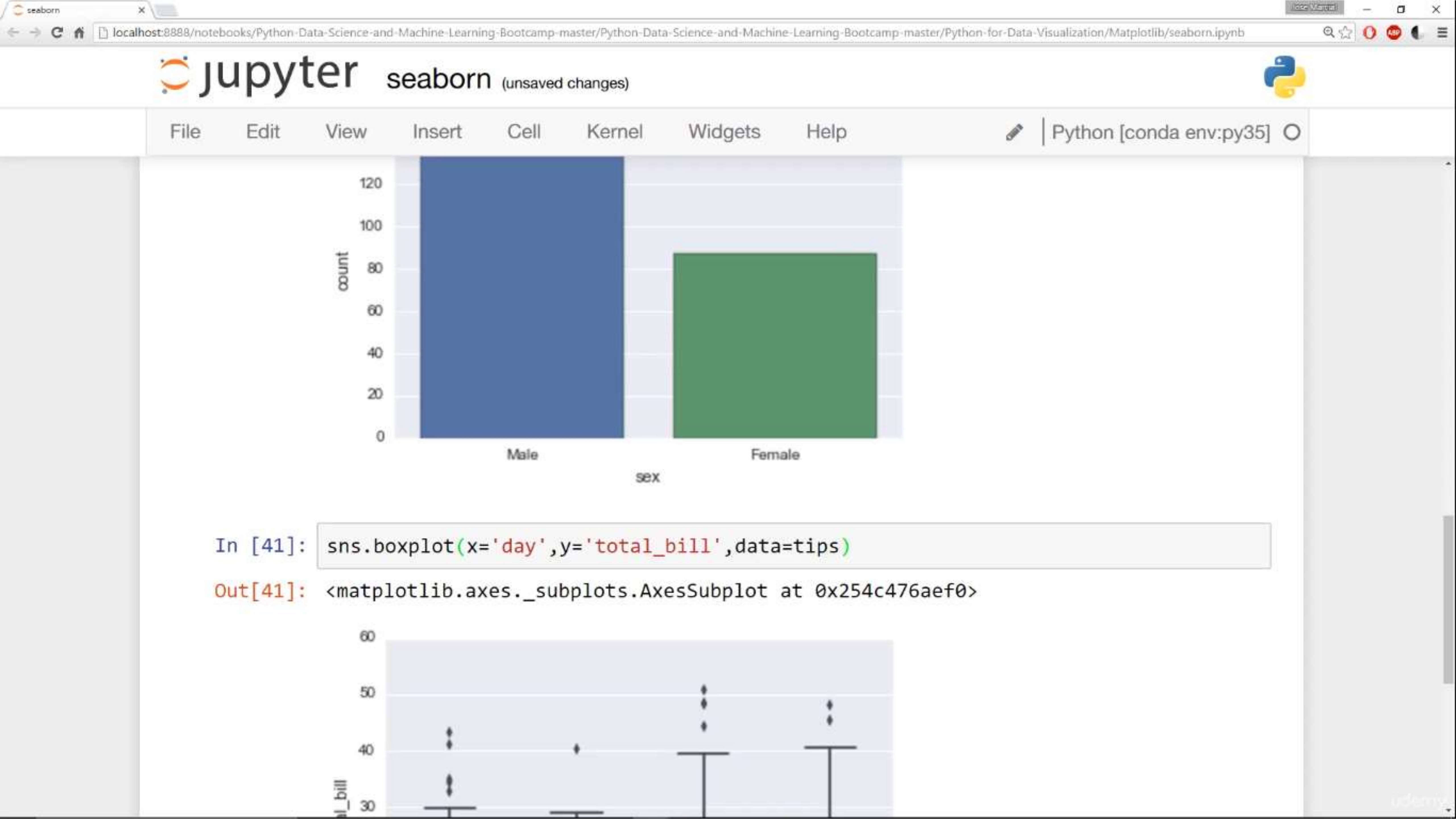
In [40]:

```
sns.countplot(x='sex',data=tips)
```

Out[40]:

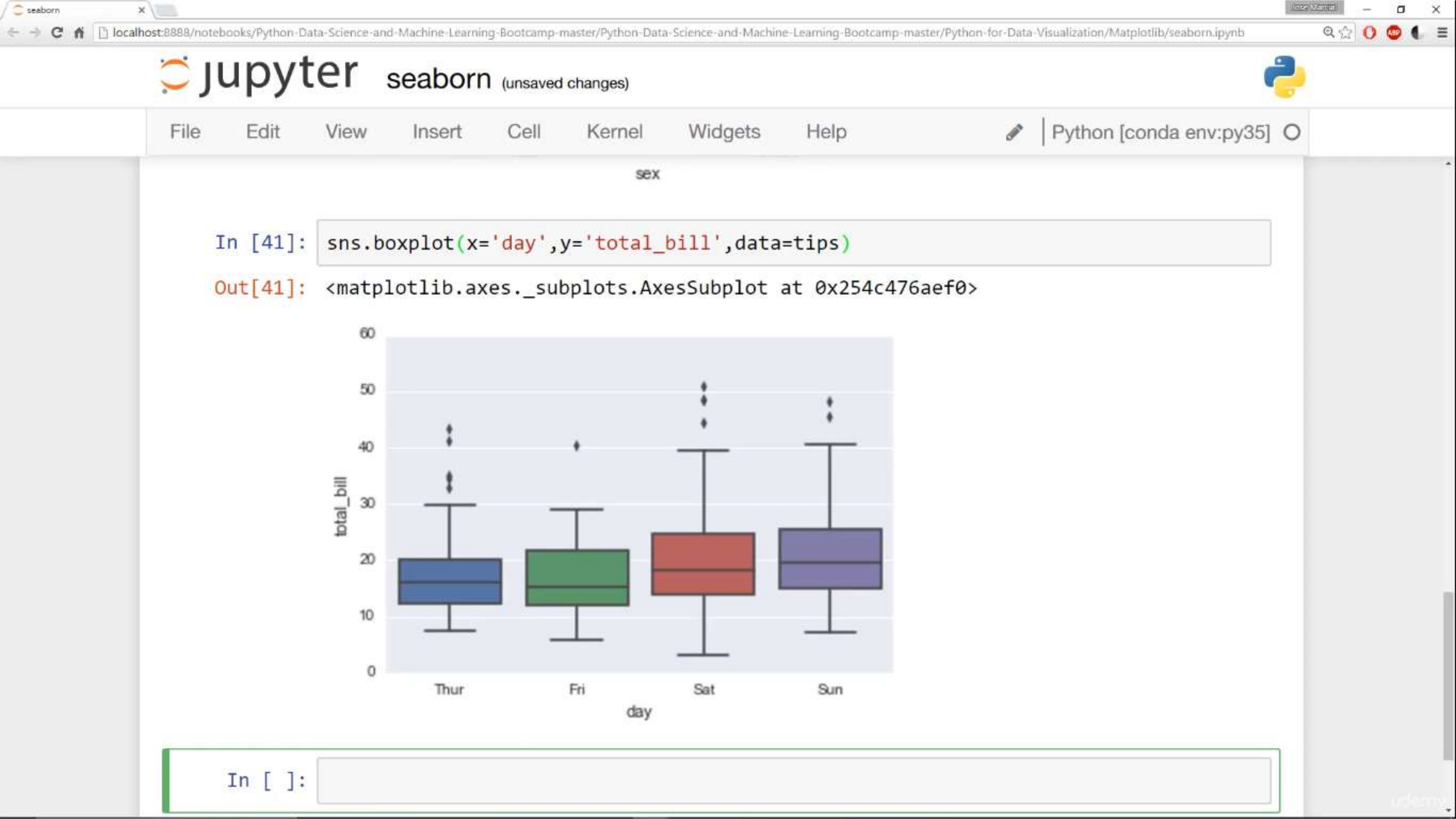
```
<matplotlib.axes._subplots.AxesSubplot at 0x254c4707ba8>
```

160
140
120
100
80
60
40
20
0
count
Male
Female
sex


seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
jupyter
seaborn (unsaved changes)
File
Edit
View
Insert
Cell
Kernel
Widgets
Help
Python [conda env:py35]
120
100
80
60
40
20
0
count
Male
Female
sex

```
In [41]: sns.boxplot(x='day',y='total_bill',data=tips)
```

```
Out[41]: <matplotlib.axes._subplots.AxesSubplot at 0x254c476aef0>
```



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jupyter
seaborn (unsaved changes)
File
Edit
View
Insert
Cell
Kernel
Widgets
Help
Python [conda env:py35]
sex

In [41]:

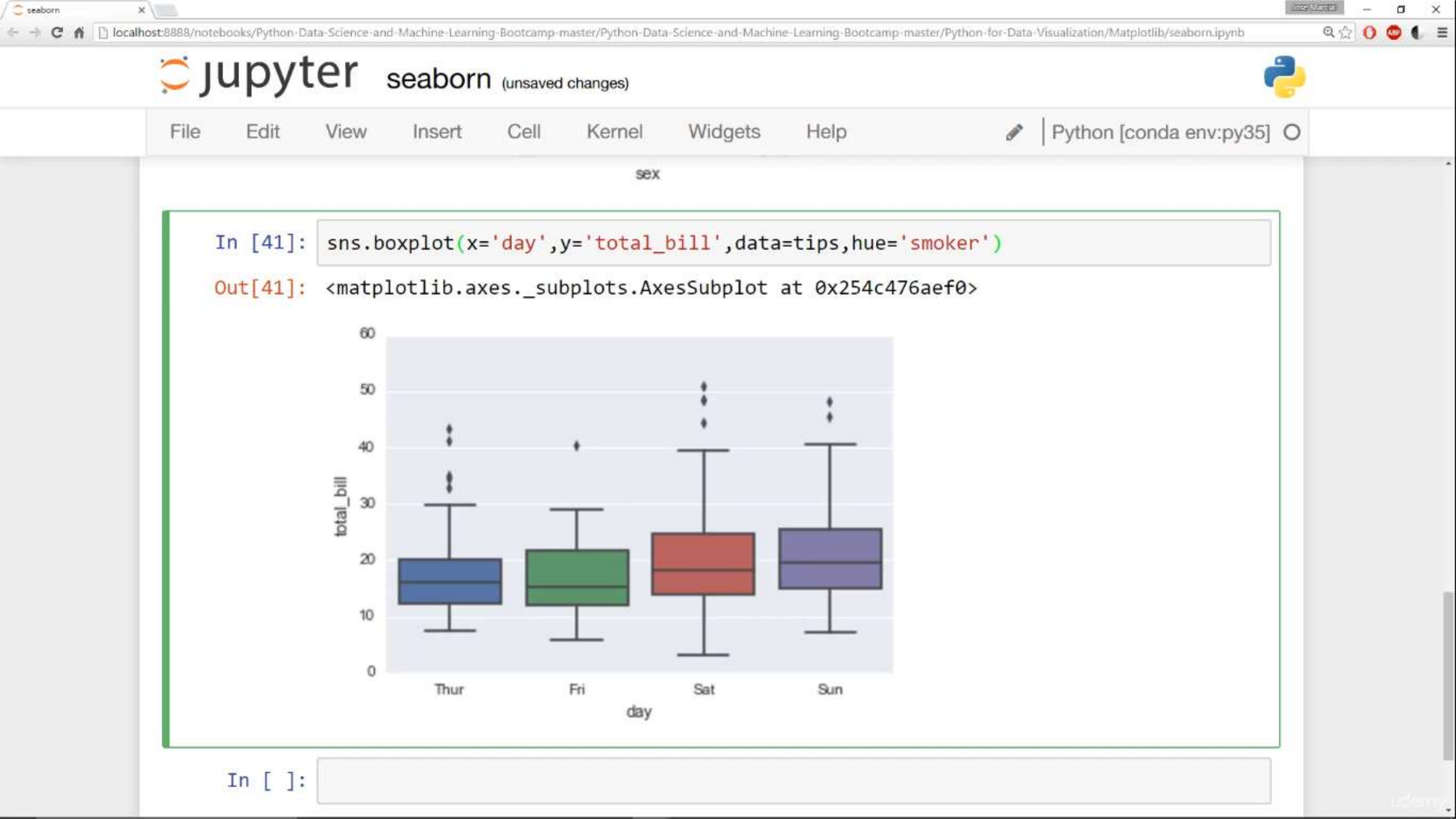
```
sns.boxplot(x='day',y='total_bill',data=tips)
```

Out[41]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x254c476aef0>
```

60
50
40
30
20
10
0
total_bill
Thur
Fri
Sat
Sun
day

In [ ]: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localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
jupyter
File
Edit
View
Insert
Cell
Kernel
Widgets
Help
Python [conda env:py35]
sex

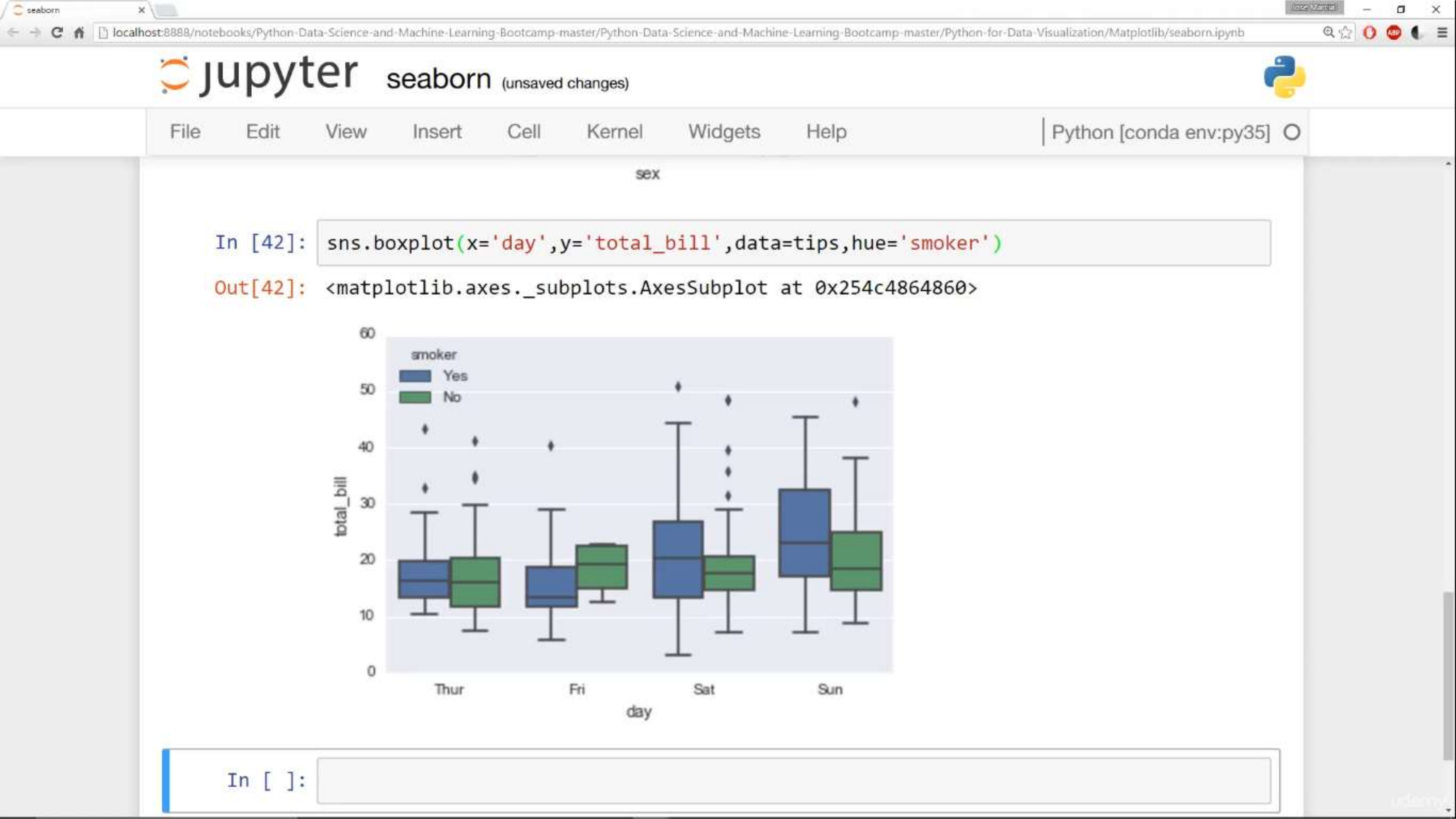
seaborn (unsaved changes)

```
In [41]: sns.boxplot(x='day',y='total_bill',data=tips,hue='smoker')

Out[41]: <matplotlib.axes._subplots.AxesSubplot at 0x254c476aef0>
```

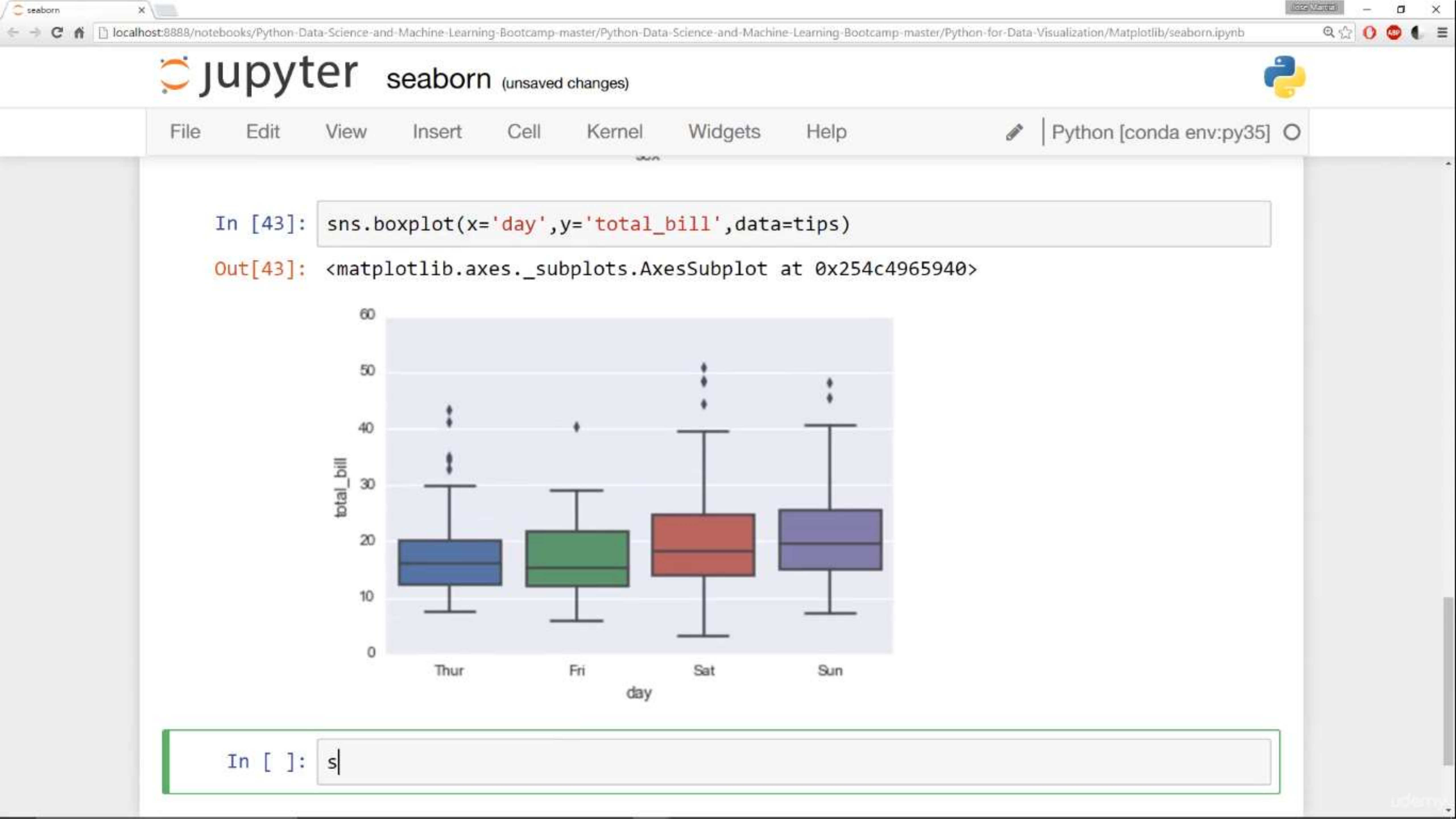
60
50
40
30
20
10
0
total_bill
Thur
Fri
Sat
Sun
day

```
In [ ]:
```


seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
jupyter
seaborn (unsaved changes)
File
Edit
View
Insert
Cell
Kernel
Widgets
Help
Python [conda env:py35]
sex
smoker
Yes
No
60
50
40
30
20
10
0
total_bill
Thur
Fri
Sat
Sun
day
In [ ]:

```
In [42]: sns.boxplot(x='day',y='total_bill',data=tips,hue='smoker')

Out[42]: <matplotlib.axes._subplots.AxesSubplot at 0x254c4864860>
```



seaborn
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jupyter
seaborn (unsaved changes)
File
Edit
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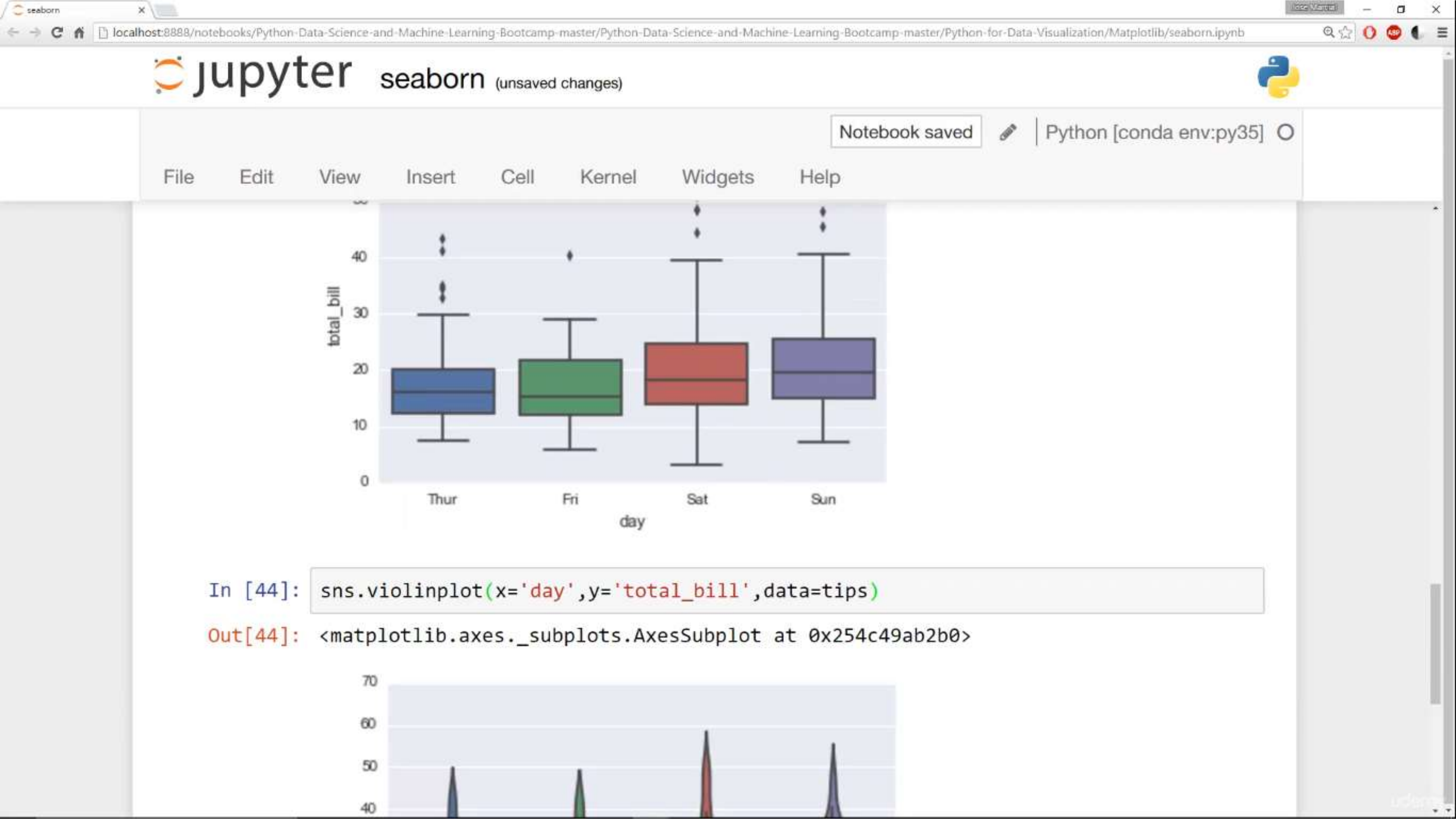
Kernel
Widgets
Help
Python [conda env:py35]

```
In [43]: sns.boxplot(x='day',y='total_bill',data=tips)
```

```
Out[43]: <matplotlib.axes._subplots.AxesSubplot at 0x254c4965940>
```

60
50
40
30
20
10
0
total_bill
Thur
Fri
Sat
Sun
day

```
In [ ]: s
```


seaborn
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seaborn (unsaved changes)
Notebook saved
Python [conda env:py35]
File
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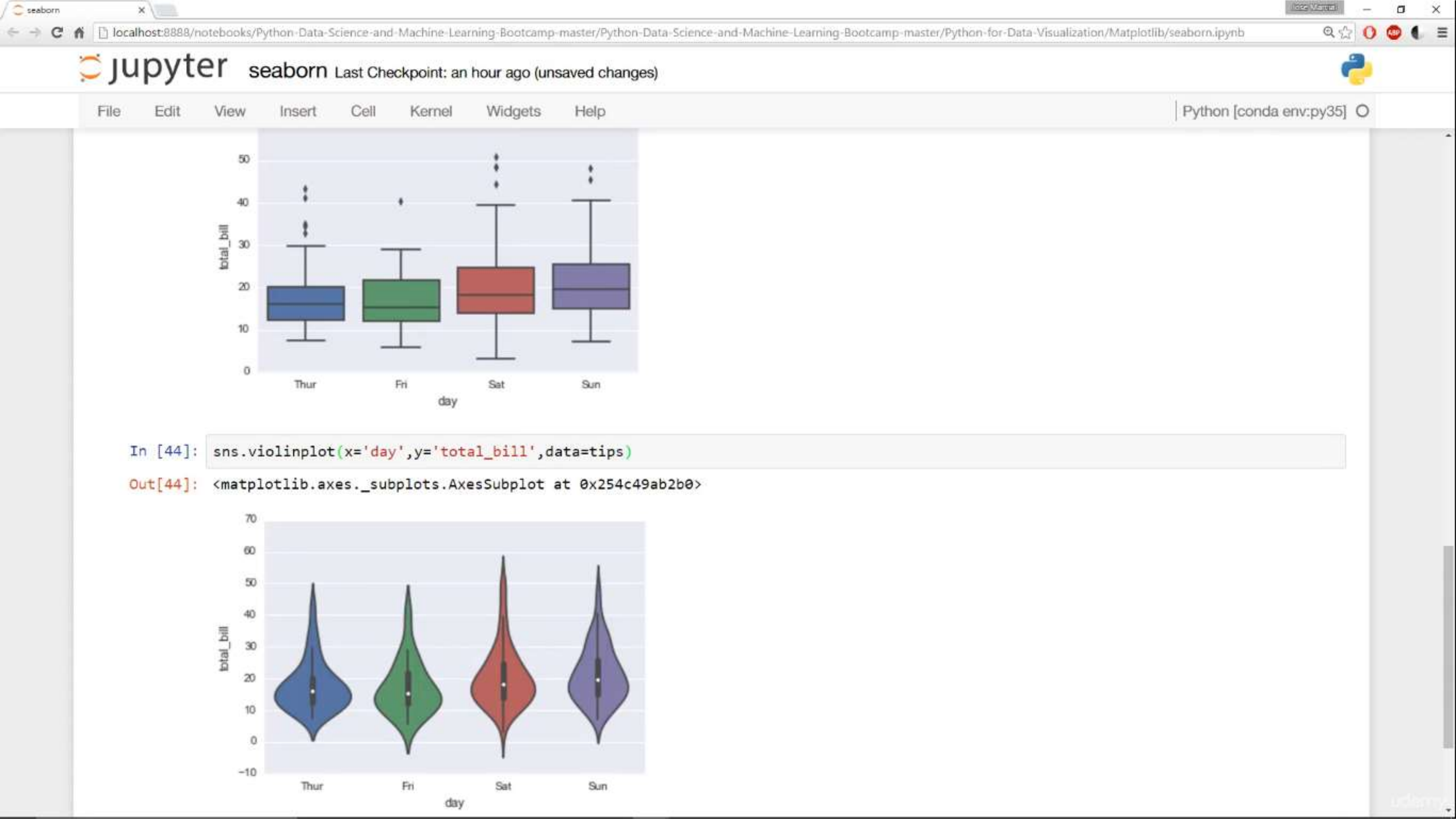
Widgets
Help
40
30
20
10
0
total_bill
Thur
Fri
Sat
Sun
day
70
60
50
40

```
In [44]: sns.violinplot(x='day',y='total_bill',data=tips)

Out[44]: <matplotlib.axes._subplots.AxesSubplot at 0x254c49ab2b0>
```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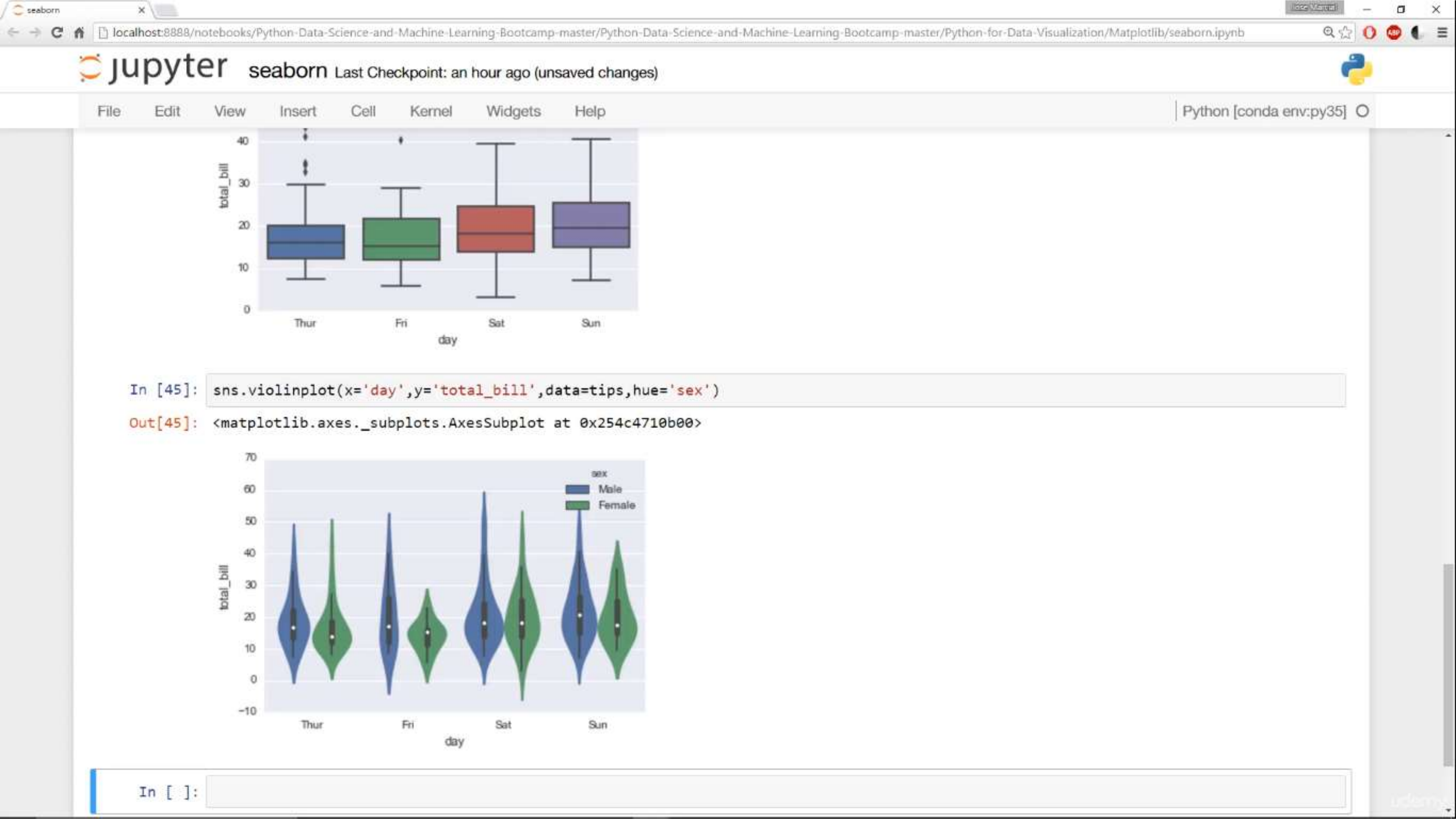
Help
Python [conda env:py35]
50
40
30
20
10
0
total_bill
Thur
Fri
Sat
Sun
day

```
In [44]: sns.violinplot(x='day',y='total_bill',data=tips)
```

```
Out[44]: <matplotlib.axes._subplots.AxesSubplot at 0x254c49ab2b0>
```

70
60
50
40
30
20
10
0
−10
total_bill
Thur
Fri
Sat
Sun
day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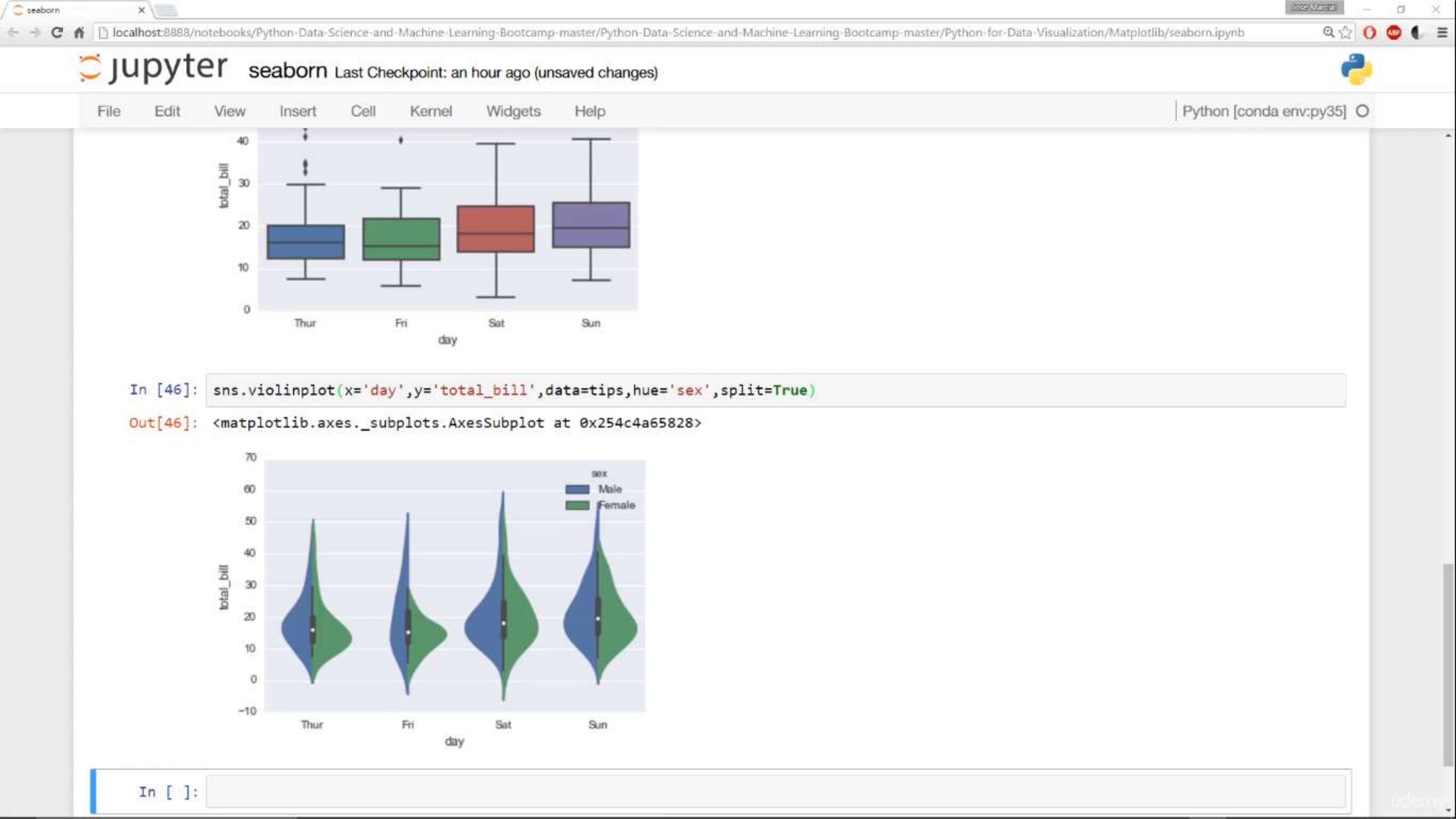
Python [conda env:py35]
40
30
20
10
0
total_bill
Thur
Fri
Sat
Sun
day

```
In [45]: sns.violinplot(x='day',y='total_bill',data=tips,hue='sex')
```

```
Out[45]: <matplotlib.axes._subplots.AxesSubplot at 0x254c4710b00>
```

70
60
50
40
30
20
10
0
−10
total_bill
sex
Male
Female
Thur
Fri
Sat
Sun
day
In [ ]:



seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
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seaborn Last Checkpoint: an hour ago (unsaved changes)
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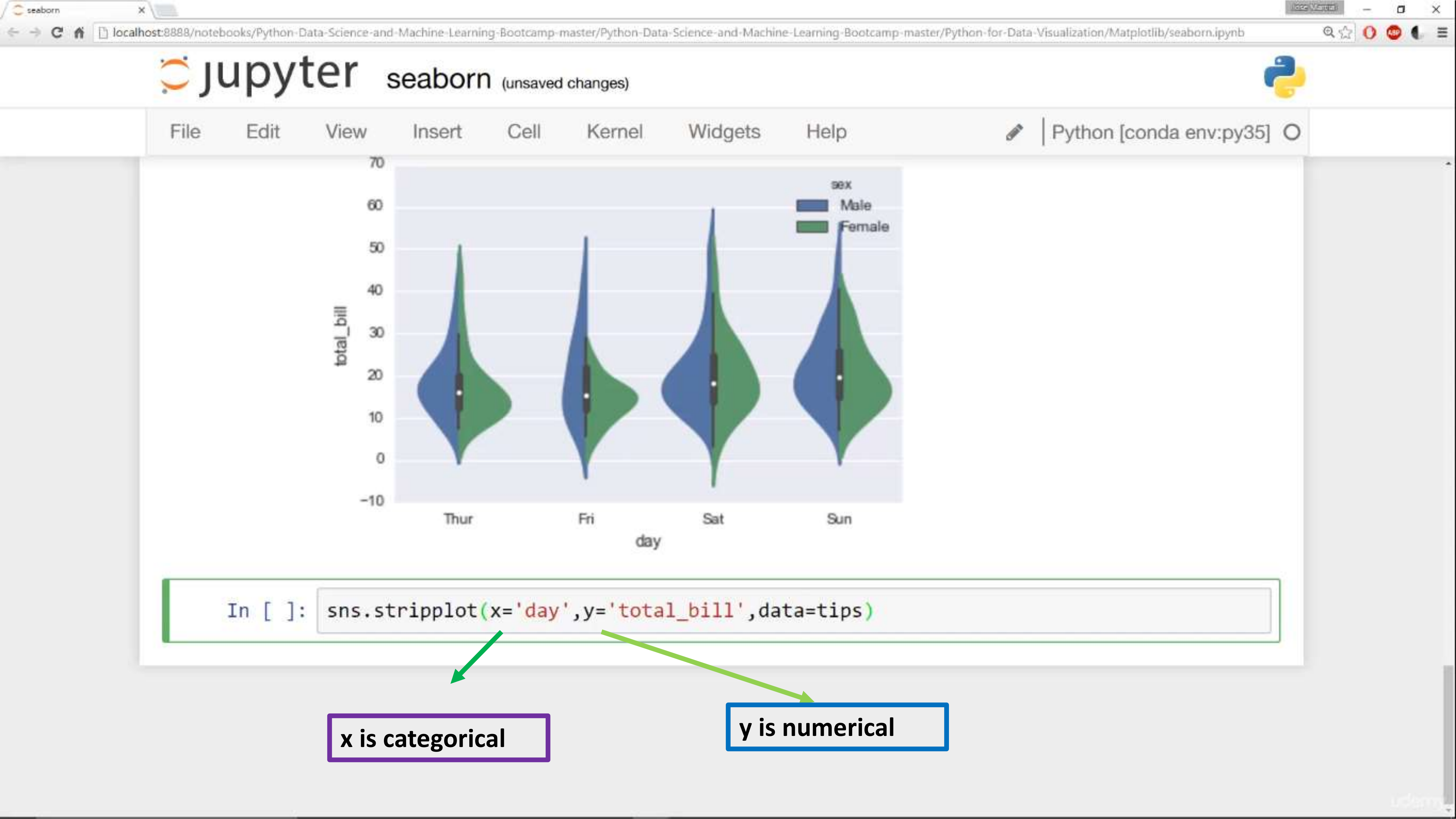
Cell
Kernel
Widgets
Help
Python [conda env:py35]
40
30
20
10
0
total_bill
Thur
Fri
Sat
Sun
day

```
In [46]: sns.violinplot(x='day',y='total_bill',data=tips,hue='sex',split=True)
```

```
Out[46]: <matplotlib.axes._subplots.AxesSubplot at 0x254c4a65828>
```

70
60
50
40
30
20
10
0
−10
total_bill
sex
Male
Female
Thur
Fri
Sat
Sun
day
In [ ]:


seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
jupyter
seaborn (unsaved changes)
File
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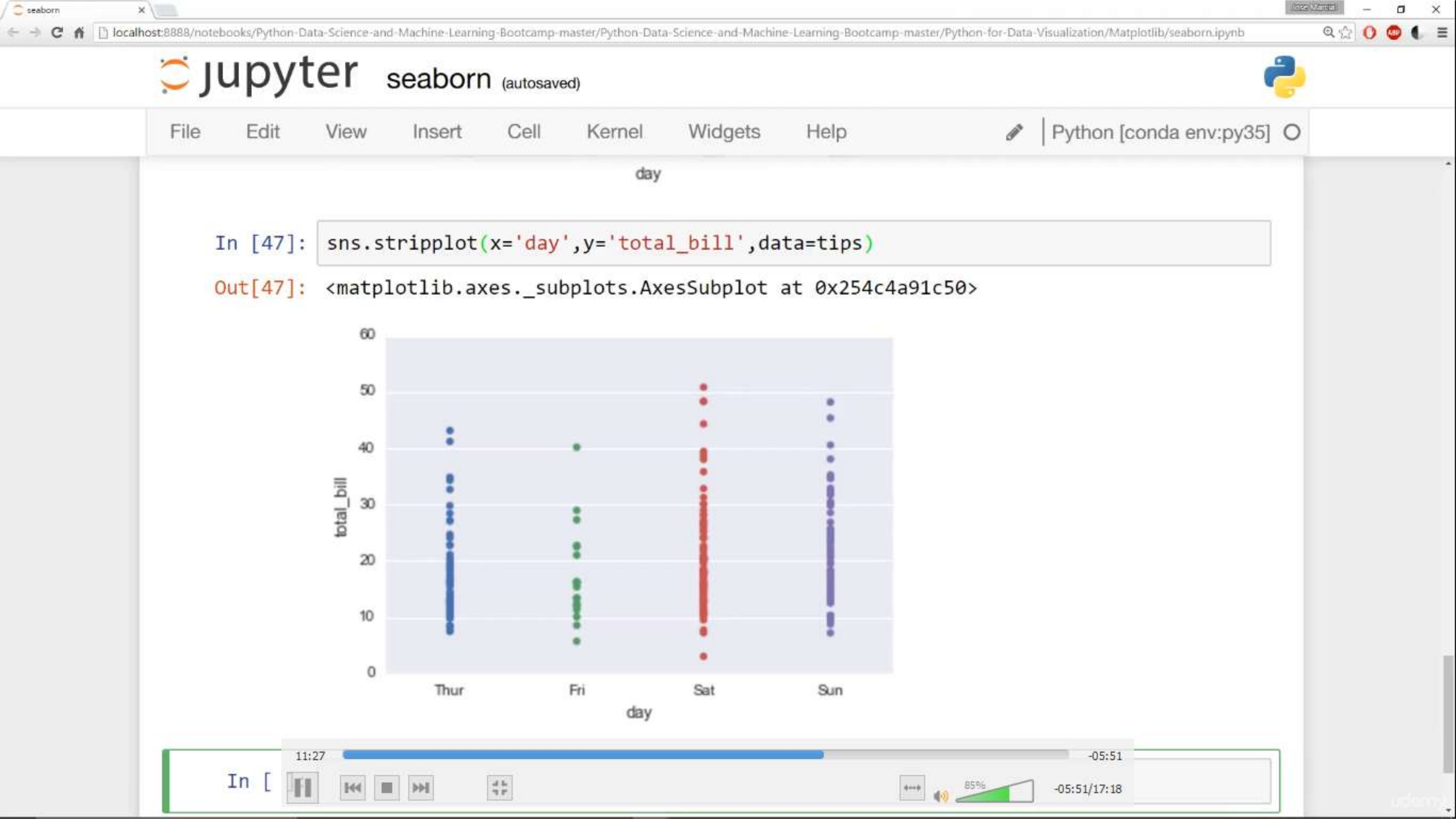
Kernel
Widgets
Help
Python [conda env:py35]
sex
Male
Female
total_bill
70
60
50
40
30
20
10
0
−10
Thur
Fri
Sat
Sun
day

```
In [ ]: sns.stripplot(x='day',y='total_bill',data=tips)
```

x is categorical

y is numerical


seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
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seaborn (autosaved)
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Widgets
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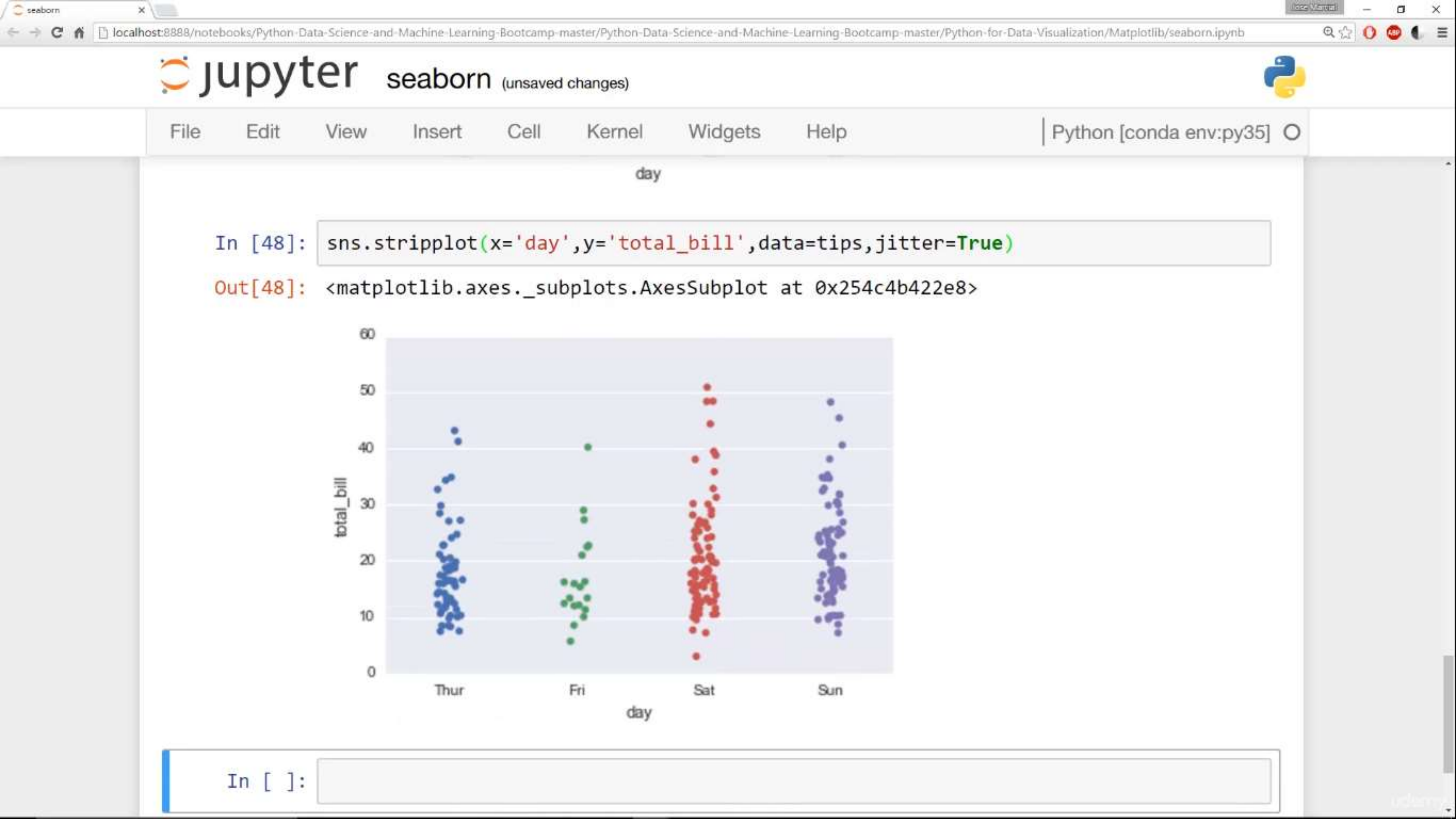
Python [conda env:py35]
day
60
50
40
30
20
10
0
total_bill
Thur
Fri
Sat
Sun
day
11:27
-05:51
85%
-05:51/17:18

```
In [47]: sns.stripplot(x='day',y='total_bill',data=tips)

Out[47]: <matplotlib.axes._subplots.AxesSubplot at 0x254c4a91c50>
```

```
In [
```



seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
jupyter
seaborn (unsaved changes)
File
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Insert
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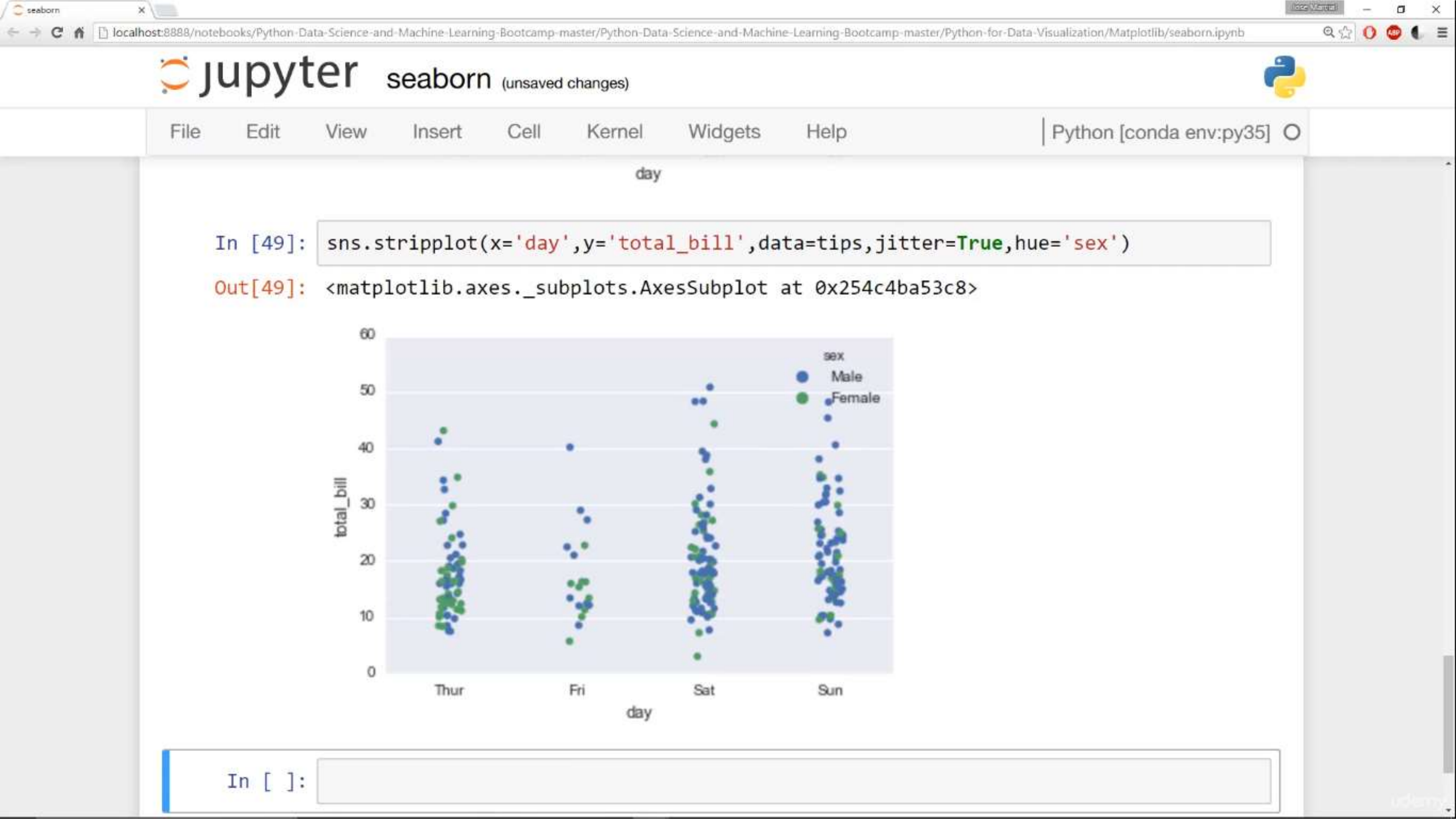
Kernel
Widgets
Help
Python [conda env:py35]
day
60
50
40
30
20
10
0
total_bill
Thur
Fri
Sat
Sun
day

```
In [48]: sns.stripplot(x='day',y='total_bill',data=tips,jitter=True)

Out[48]: <matplotlib.axes._subplots.AxesSubplot at 0x254c4b422e8>
```

```
In [ ]:
```


seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
jupyter
seaborn (unsaved changes)
File
Edit
View
Insert
Cell
Kernel
Widgets
Help
Python [conda env:py35]
day

```
In [49]: sns.stripplot(x='day',y='total_bill',data=tips,jitter=True,hue='sex')

Out[49]: <matplotlib.axes._subplots.AxesSubplot at 0x254c4ba53c8>
```

60
50
40
30
20
10
0
total_bill
sex
Male
Female
Thur
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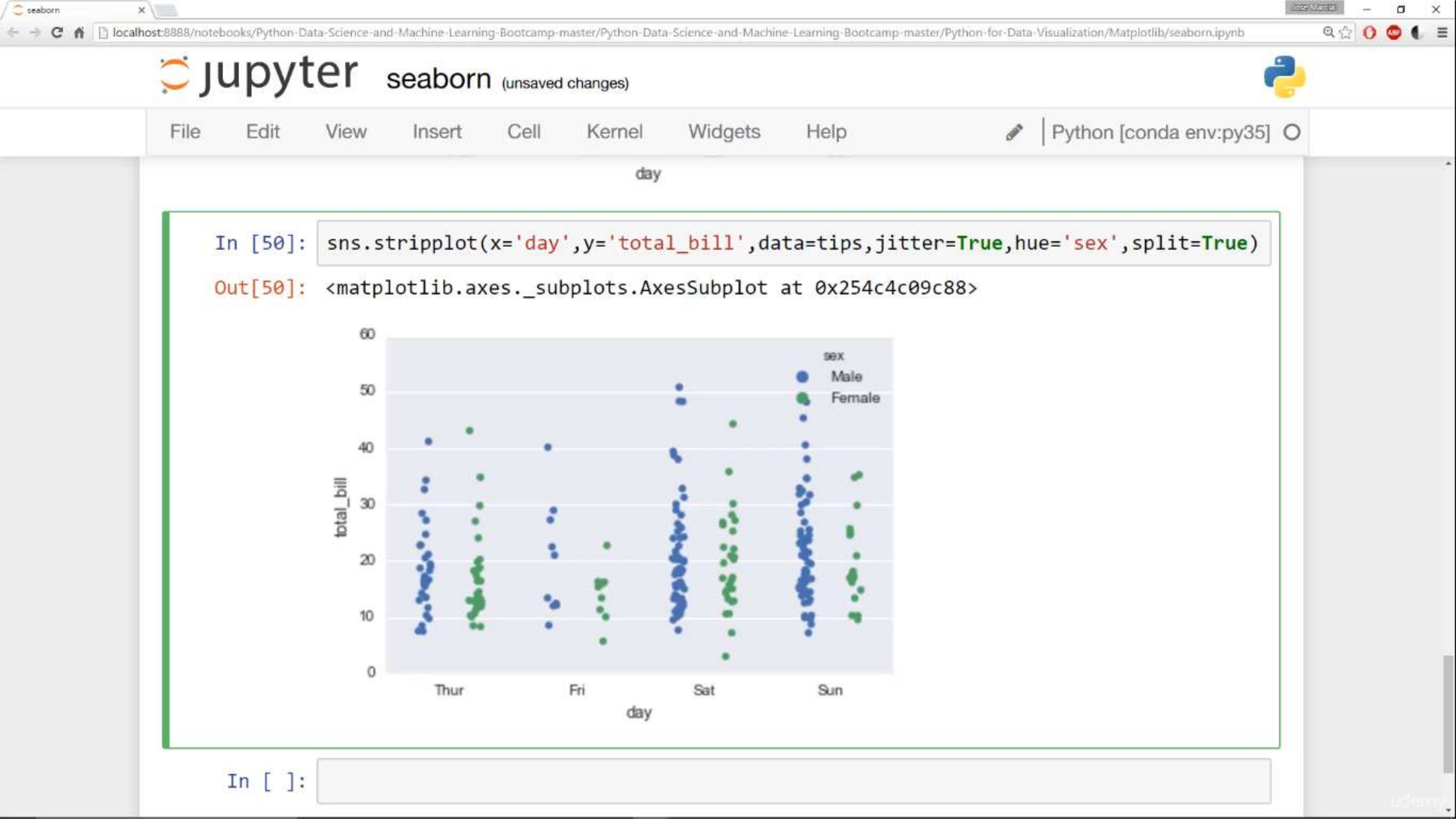
Sun
day
In [ ]:


seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
jupyter
seaborn (unsaved changes)
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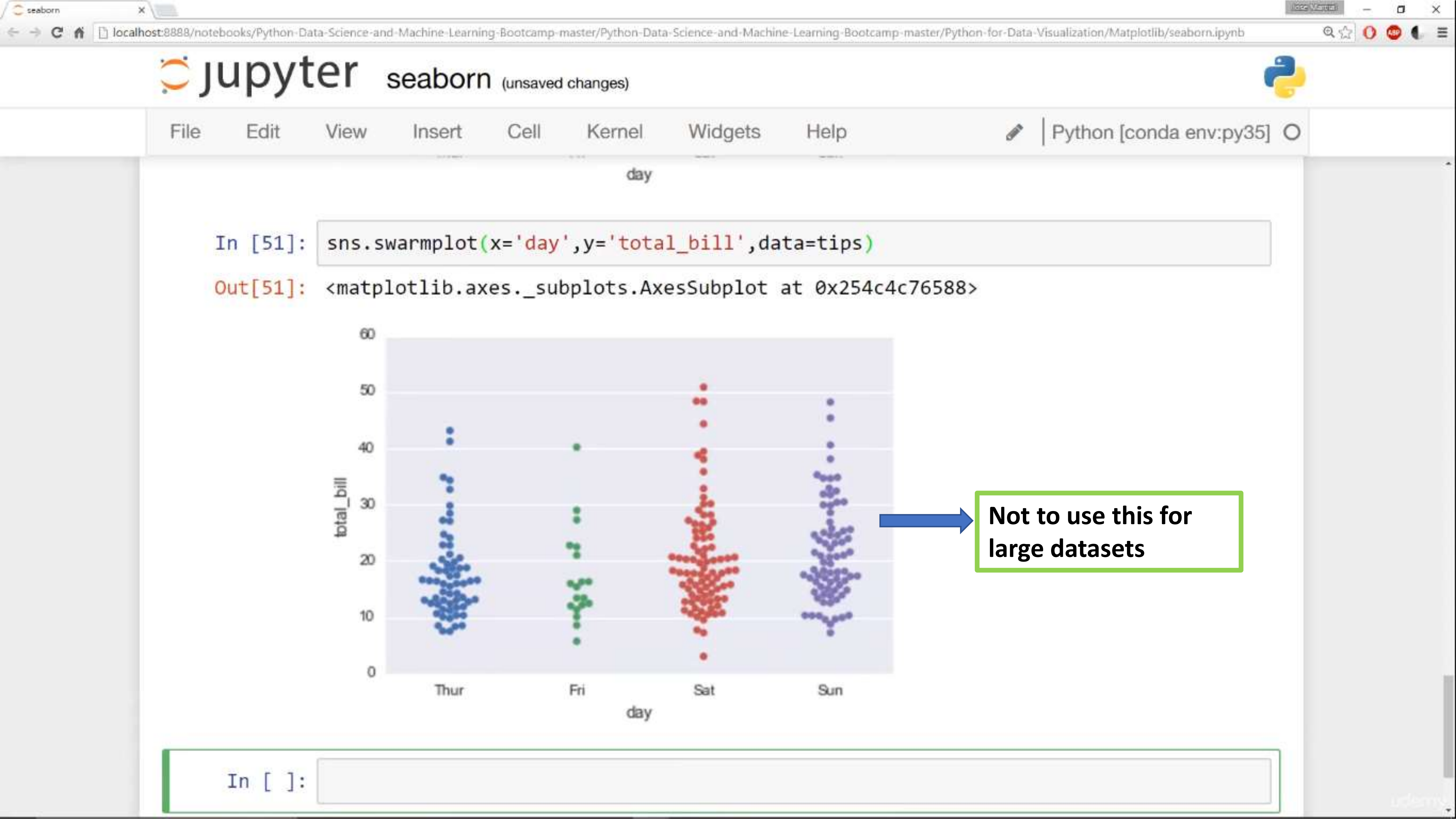
day
sex
Male
Female
total_bill
60
50
40
30
20
10
0
Thur
Fri
Sat
Sun
day

```
In [50]: sns.stripplot(x='day',y='total_bill',data=tips,jitter=True,hue='sex',split=True)

Out[50]: <matplotlib.axes._subplots.AxesSubplot at 0x254c4c09c88>
```

```
In [ ]:
```


seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
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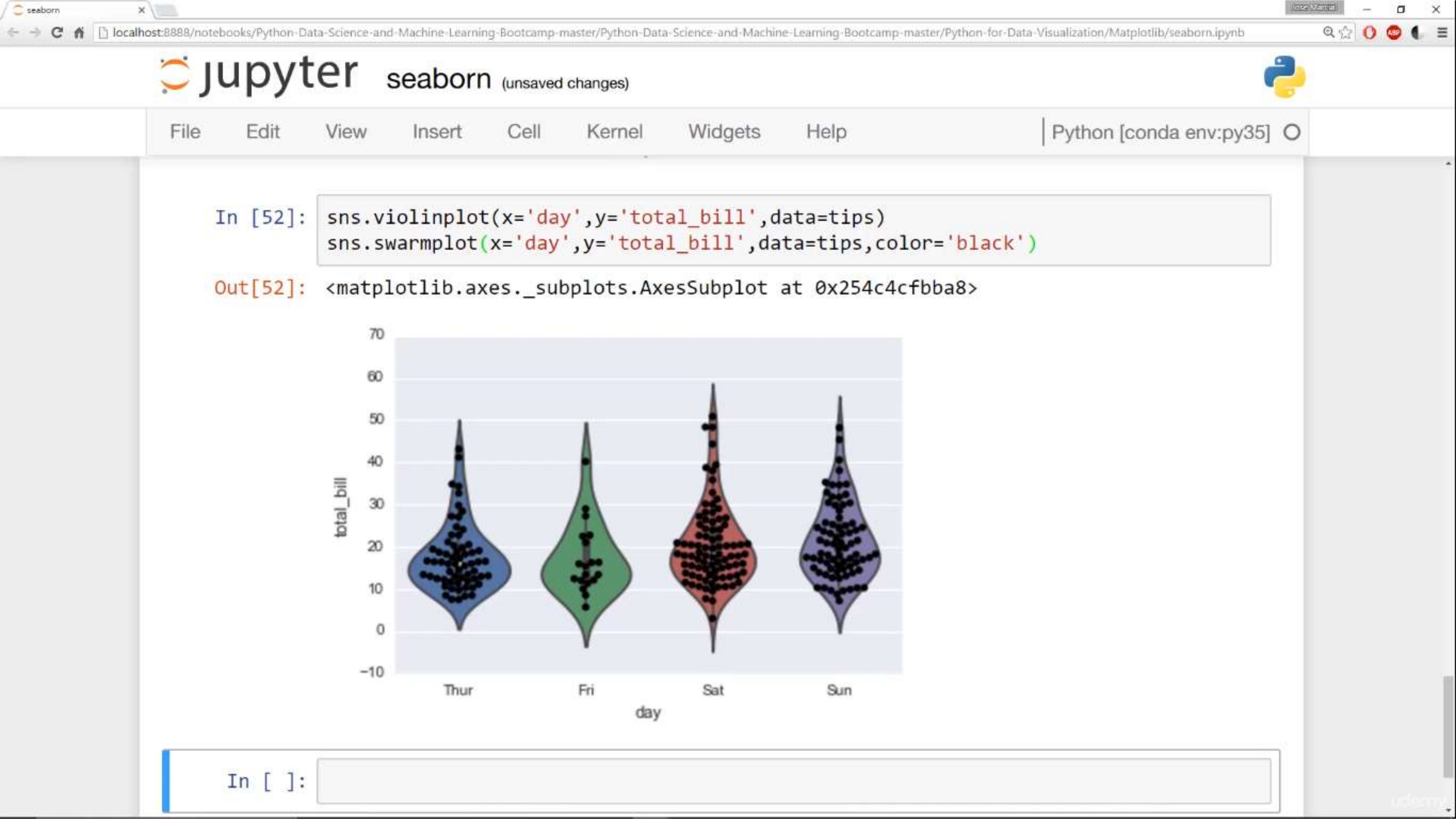
day
60
50
40
30
20
10
0
total_bill
Thur
Fri
Sat
Sun
day

```
In [51]: sns.swarmplot(x='day',y='total_bill',data=tips)

Out[51]: <matplotlib.axes._subplots.AxesSubplot at 0x254c4c76588>
```

```
In [ ]:
```

Not to use this for large datasets



seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
jupyter
seaborn (unsaved changes)
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Python [conda env:py35]
70
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−10
total_bill
Thur
Fri
Sat
Sun
day

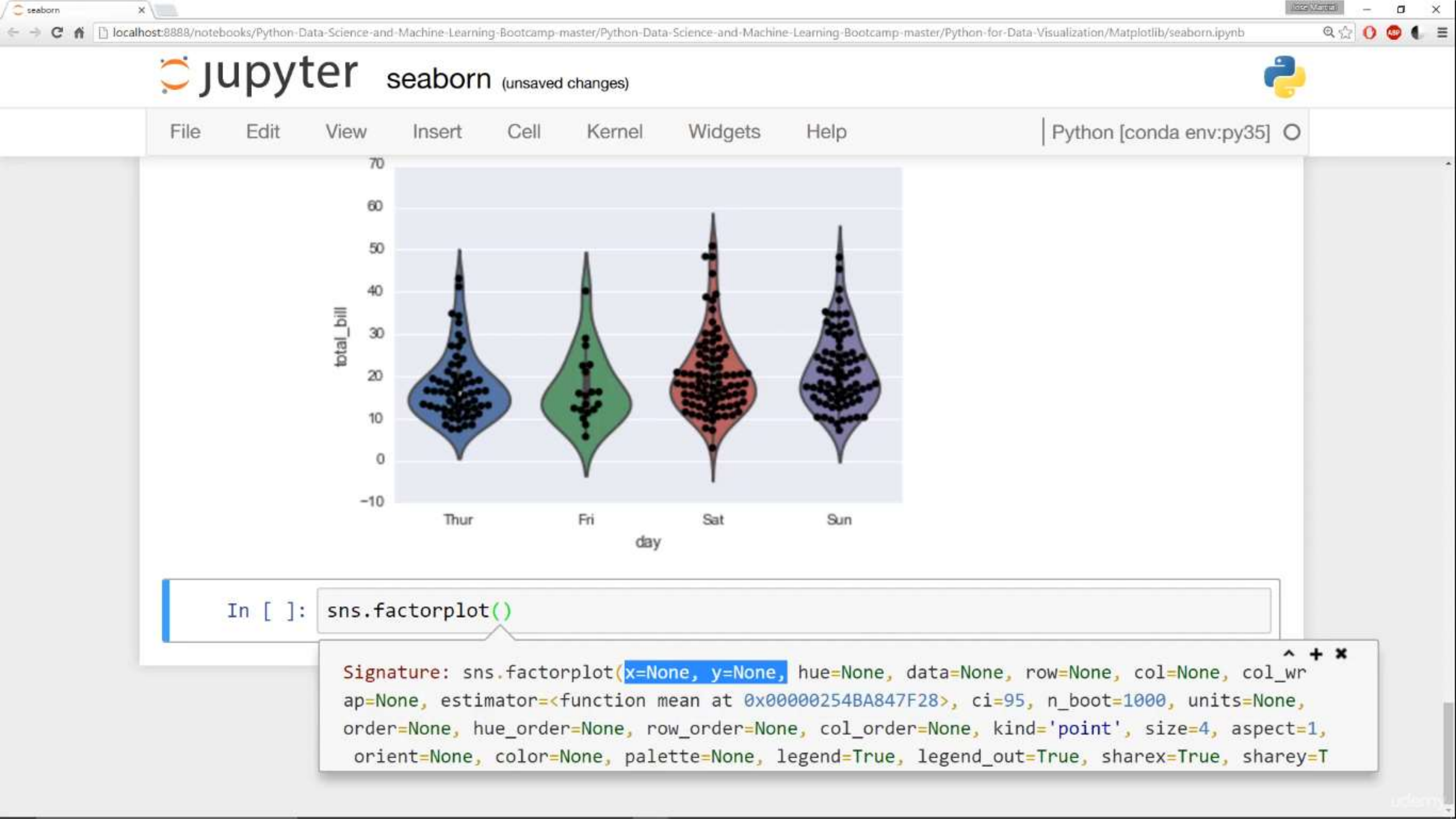
In [52]:

```
sns.violinplot(x='day',y='total_bill',data=tips)
sns.swarmplot(x='day',y='total_bill',data=tips,color='black')
```

Out[52]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x254c4cfbba8>
```

In [ ]:



seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
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seaborn (unsaved changes)
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Python [conda env:py35]
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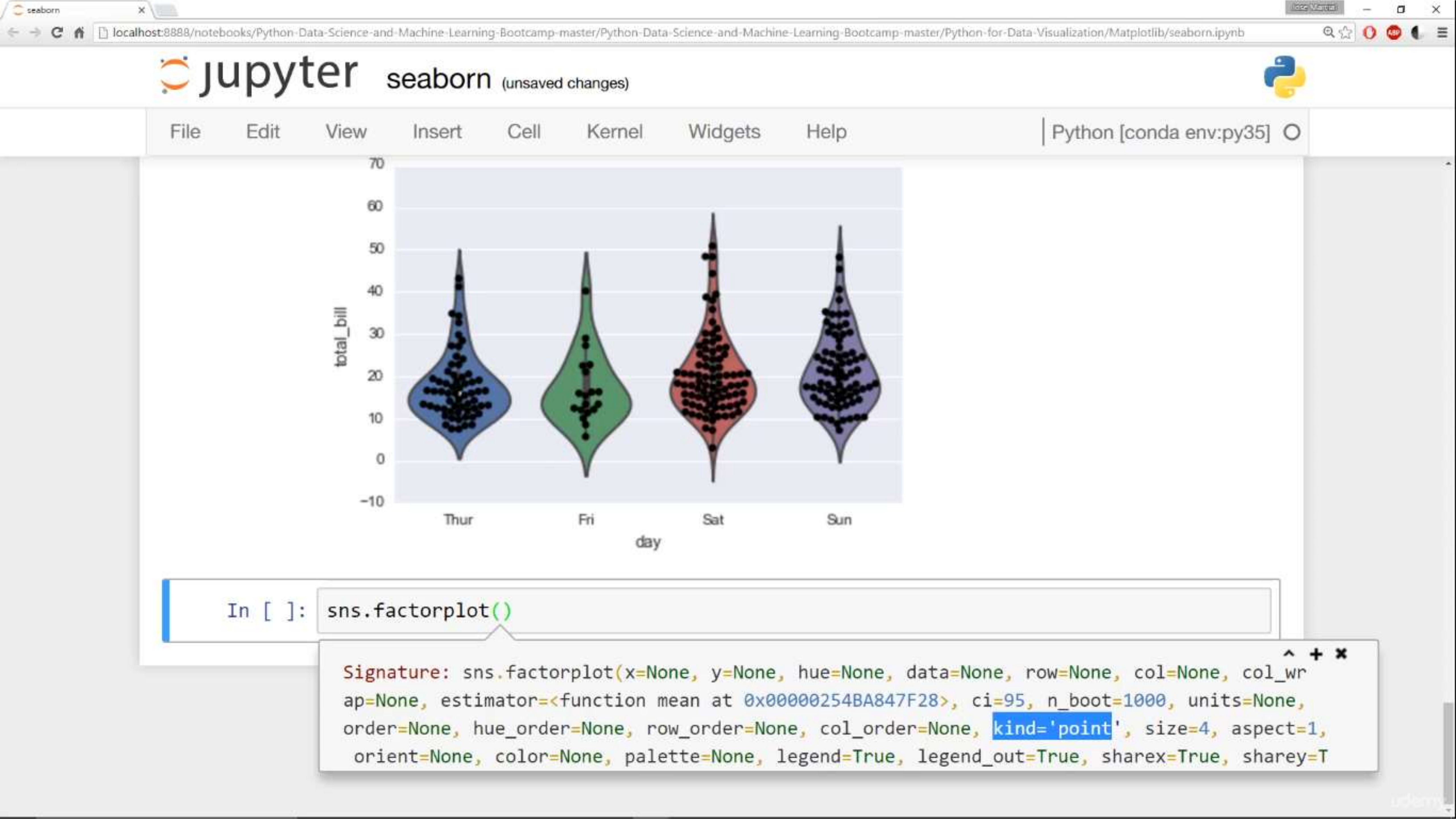
total_bill
Thur
Fri
Sat
Sun
day

```
In [ ]: sns.factorplot()
```

```
Signature: sns.factorplot(x=None, y=None, hue=None, data=None, row=None, col=None, col_wr
ap=None, estimator=<function mean at 0x00000254BA847F28>, ci=95, n_boot=1000, units=None,
order=None, hue_order=None, row_order=None, col_order=None, kind='point', size=4, aspect=1,
 orient=None, color=None, palette=None, legend=True, legend_out=True, sharex=True, sharey=T
```


seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
jupyter
seaborn (unsaved changes)
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Python [conda env:py35]
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total_bill
Thur
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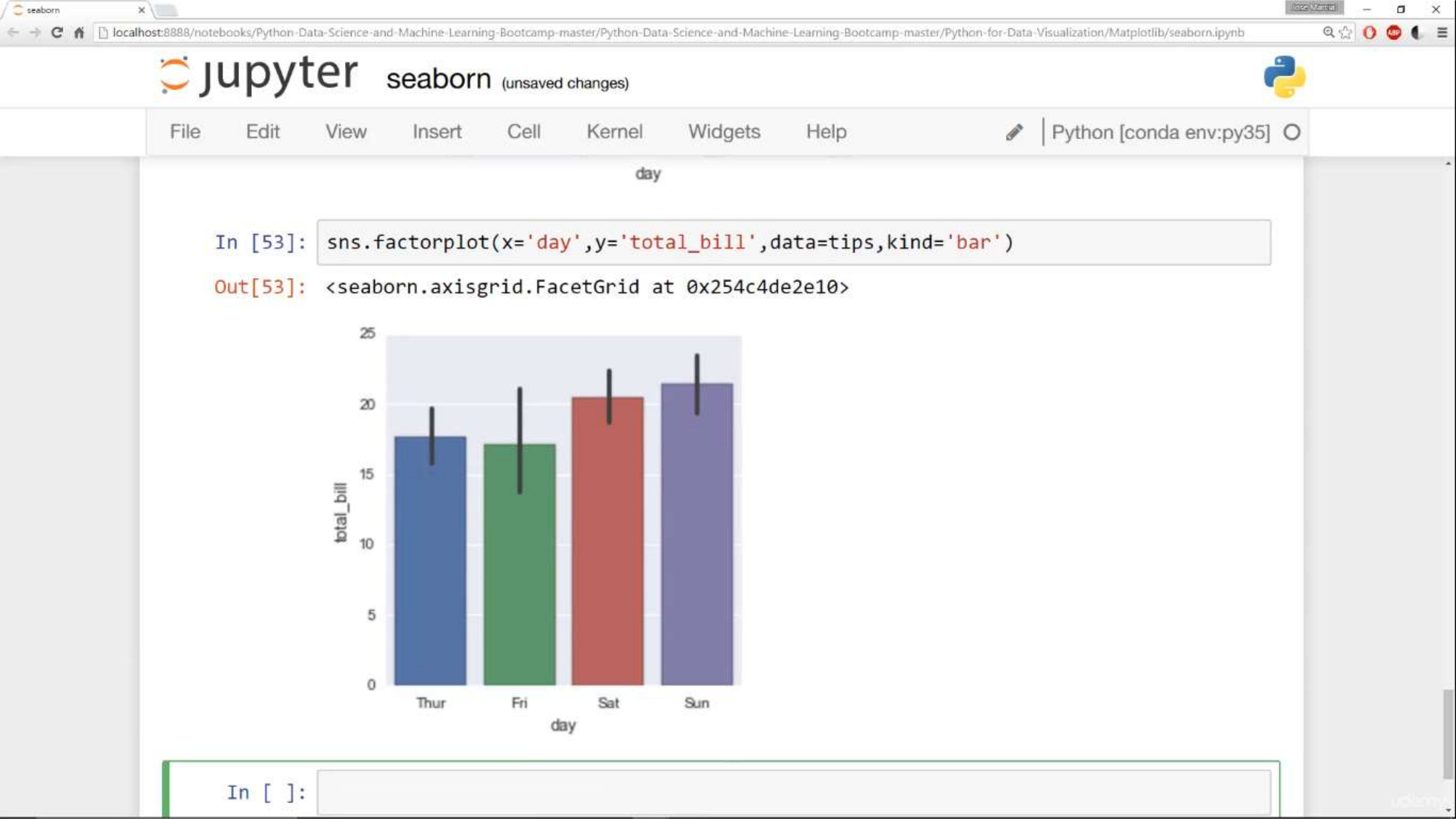
Sat
Sun
day

```
In [ ]: sns.factorplot()
```

```
Signature: sns.factorplot(x=None, y=None, hue=None, data=None, row=None, col=None, col_wr
ap=None, estimator=<function mean at 0x00000254BA847F28>, ci=95, n_boot=1000, units=None,
order=None, hue_order=None, row_order=None, col_order=None, kind='point', size=4, aspect=1,
 orient=None, color=None, palette=None, legend=True, legend_out=True, sharex=True, sharey=T
```



seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
jupyter
seaborn (unsaved changes)
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```
In [53]: sns.factorplot(x='day',y='total_bill',data=tips,kind='bar')

Out[53]: <seaborn.axisgrid.FacetGrid at 0x254c4de2e10>
```

25
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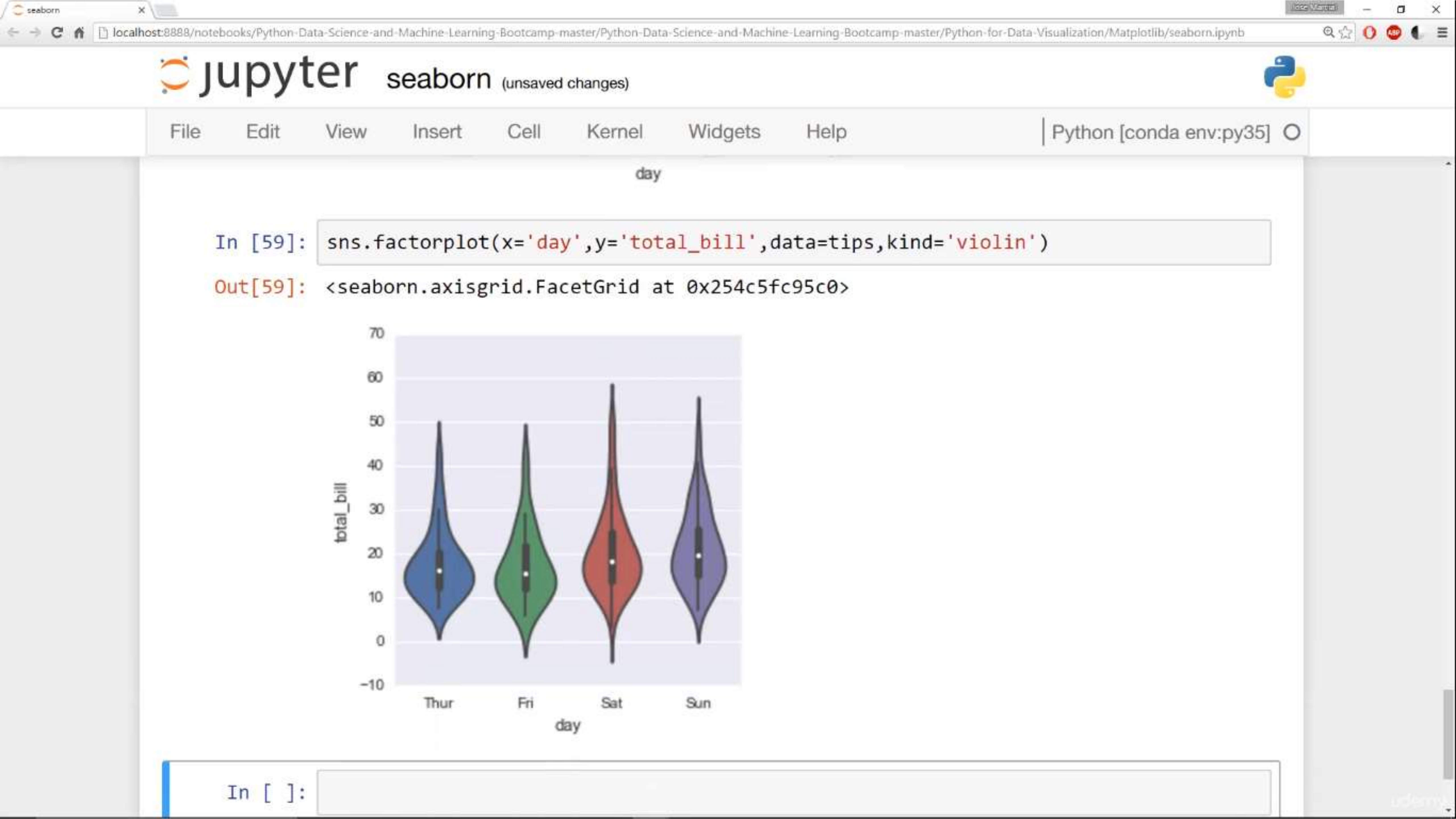
total_bill
Thur
Fri
Sat
Sun
day

```
In [ ]:
```


seaborn
localhost:8888/notebooks/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-Data-Science-and-Machine-Learning-Bootcamp-master/Python-for-Data-Visualization/Matplotlib/seaborn.ipynb
jupyter
seaborn (unsaved changes)
File
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Python [conda env:py35]
day

```
In [59]: sns.factorplot(x='day',y='total_bill',data=tips,kind='violin')

Out[59]: <seaborn.axisgrid.FacetGrid at 0x254c5fc95c0>
```

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−10
total_bill
Thur
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Sat
Sun
day

```
In [ ]:
```