Seaborn Practice - Churn Modelling Data

March 28, 2020

[1]:
```
import pandas as pd
import numpy as np
```

[2]:
```
f = pd.read_csv('C:/R Analysis/Churn_Modelling.csv')
```

[3]:
```
f.head()
```

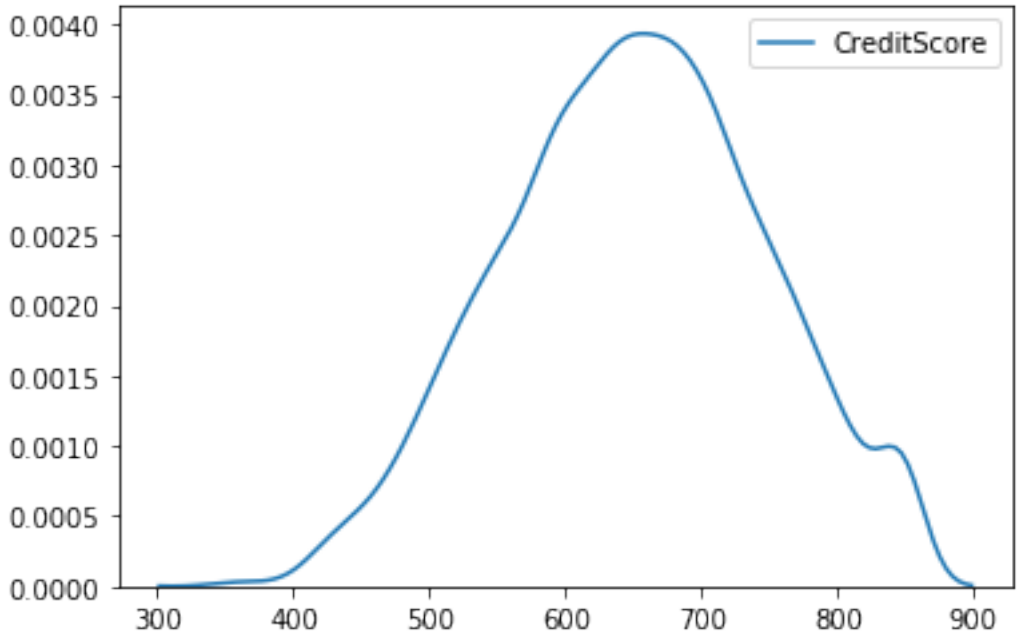
[3]:

	RowNumber	CustomerId	Surname	CreditScore	Geography	Gender	Age	Tenure	Balance	NumOfProducts	HasCrCard	IsActiveMember	EstimatedSalary	Exited
0	1	15634602	Hargrave	619	France	Female	42	2	0.00	1	1	1	101348.88	1
1	2	15647311	Hill	608	Spain	Female	41	1	83807.86	1	0	1	112542.58	0
2	3	15619304	Onio	502	France	Female	42	8	159660.80	3	1	0	113931.57	1
3	4	15701354	Boni	699	France	Female	39	1	0.00	2	0	0	93826.63	0
4	5	15737888	Mitchell	850	Spain	Female	43	2	125510.82	1	1	1	79084.10	0

[4]:
```
import seaborn as sns
```

[5]:
```
sns.kdeplot(f.CreditScore)
```

[5]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1fbd4e6e048>
```

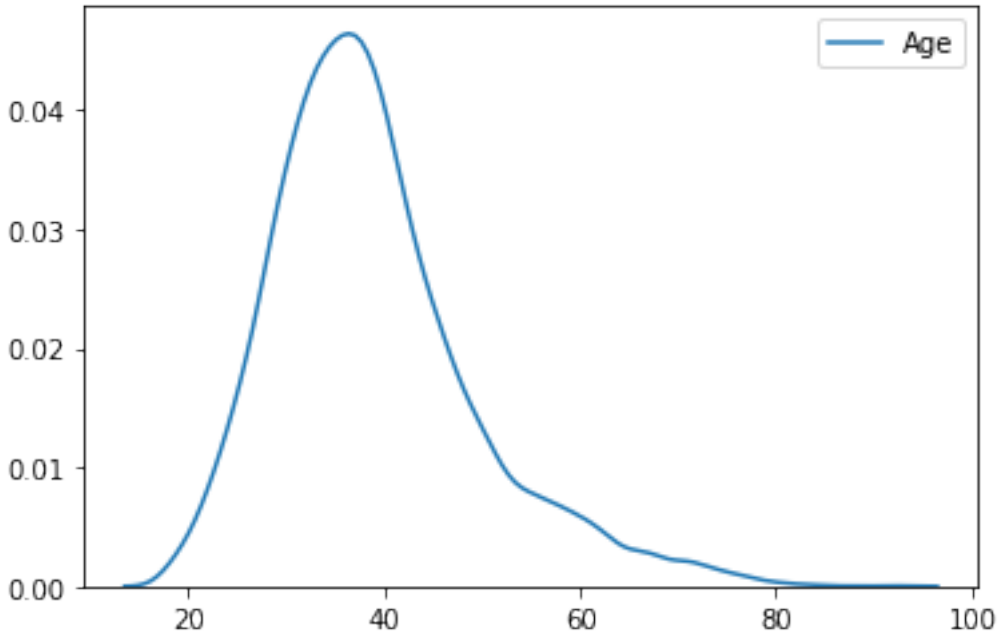


[7]:
```
print(min(f.CreditScore))
print(max(f.CreditScore))
```

```
350
850
```

[8]:
```
sns.kdeplot(f.Age)
```

[8]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1fbd4df8be0>
```



[9]:
```
print(min(f.Age))
print(max(f.Age))
```

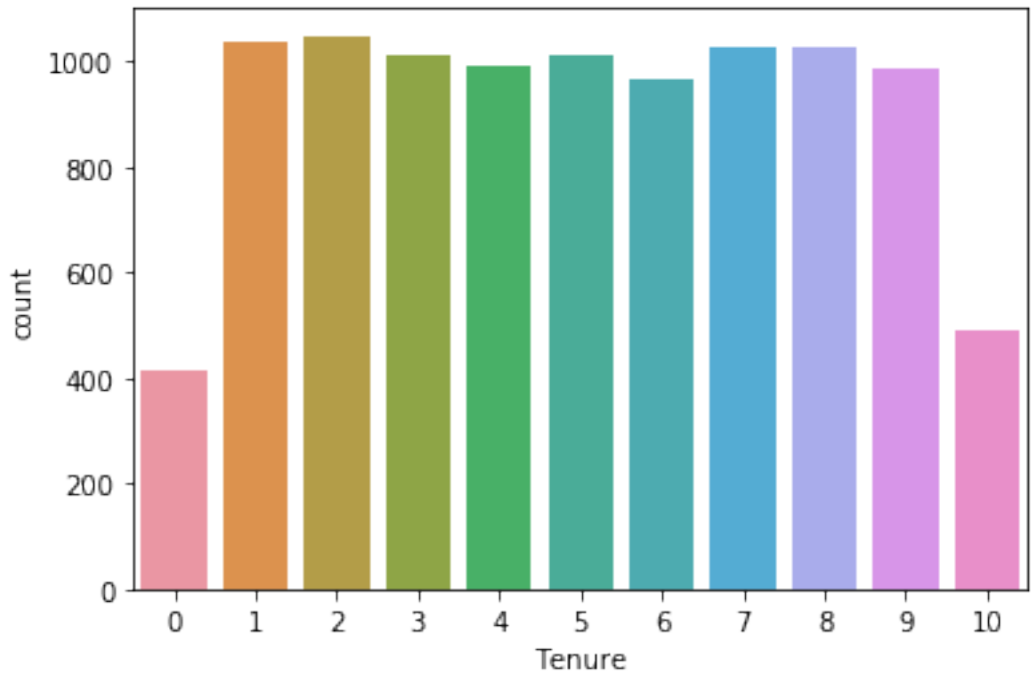
```
18
92
```

[15]:
```
set(f.Tenure)
```

[15]:
```
{0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10}
```

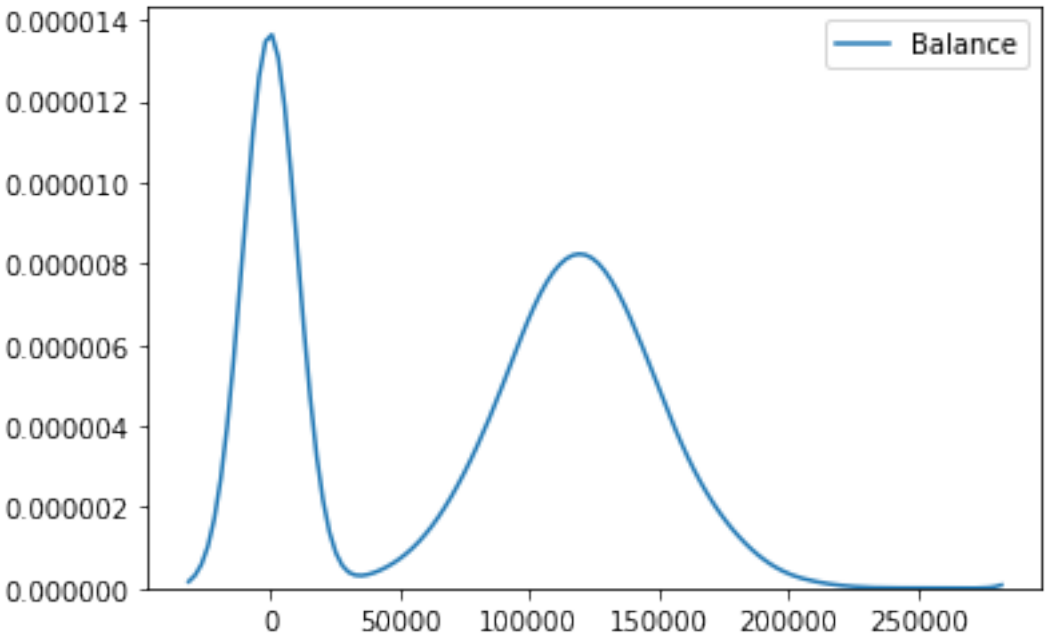
[16]:
```
sns.countplot(f.Tenure)
```

[16]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1fbd66a0518>
```



[17]:
```
sns.kdeplot(f.Balance)
```

[17]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1fbd67445c0>
```

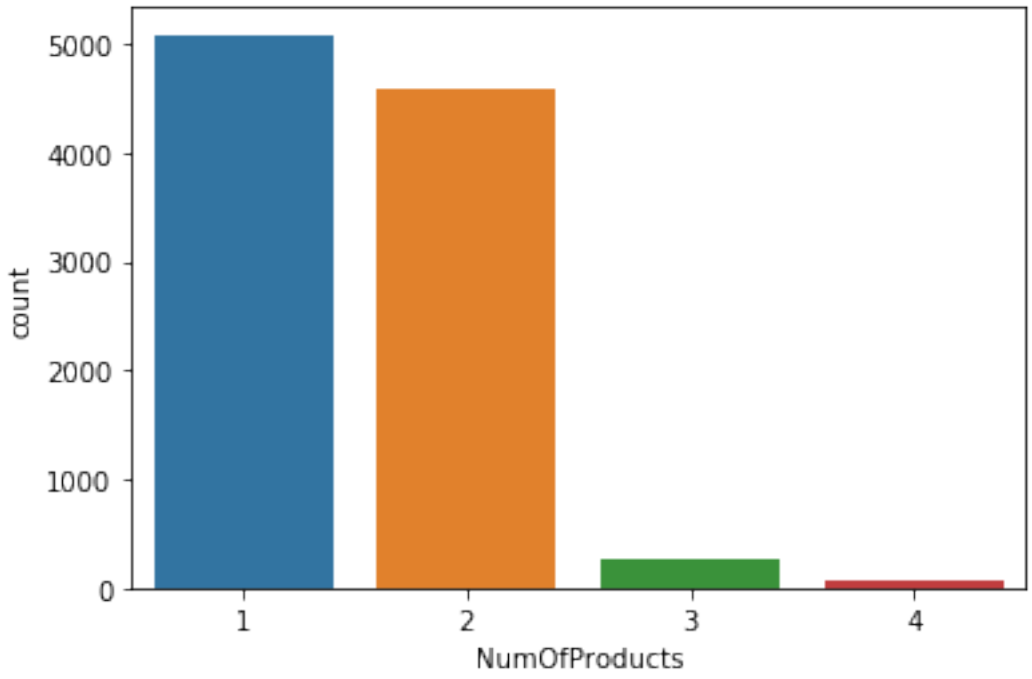


[19]:
```
print(min(f.Balance))
print(max(f.Balance))
```

```
0.0
250898.09
```

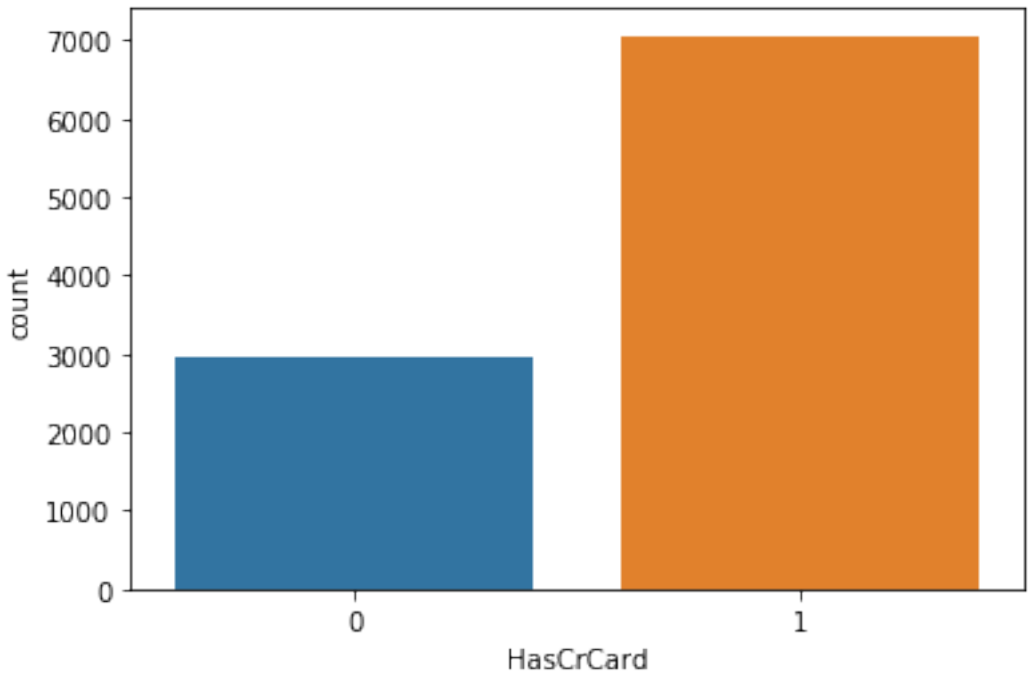
[20]:
```
sns.countplot(f.NumOfProducts)
```

[20]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1fbd67bf278>
```



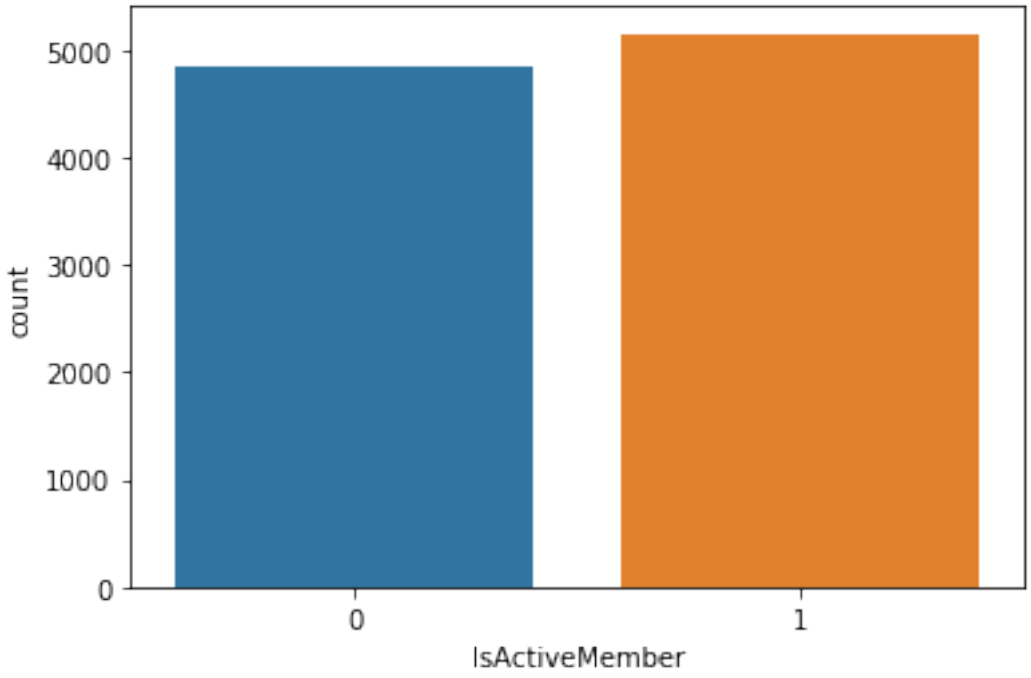
[21]:
```
sns.countplot(f.HasCrCard)
```

[21]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1fbd67e45c0>
```



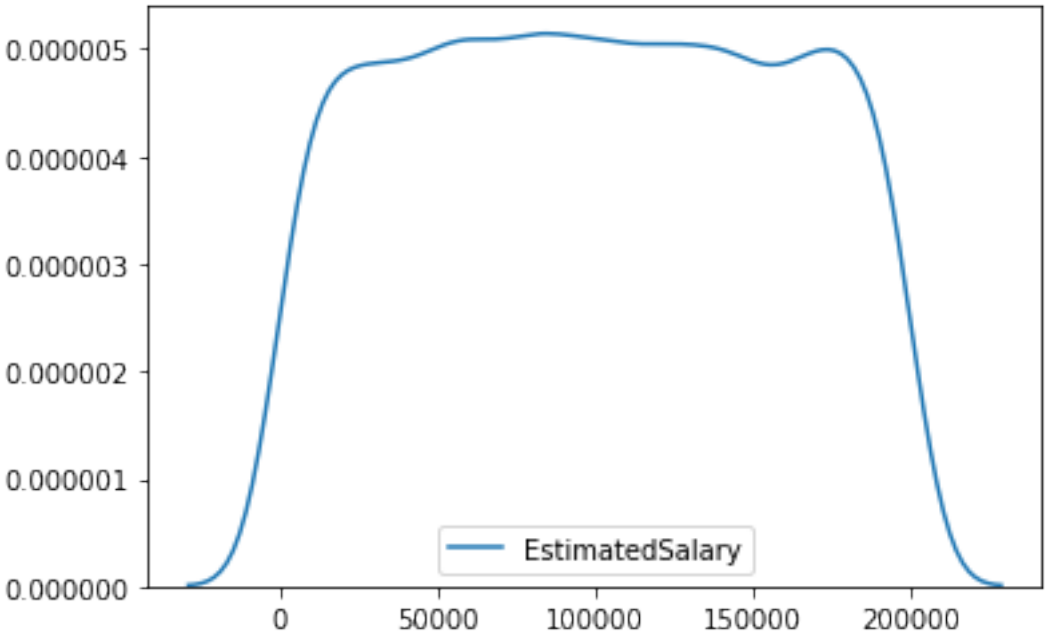
[22]:
```
sns.countplot(f.IsActiveMember)
```

[22]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1fbd684b7f0>
```



[23]:
```
sns.kdeplot(f.EstimatedSalary)
```

[23]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1fbd67fca90>
```

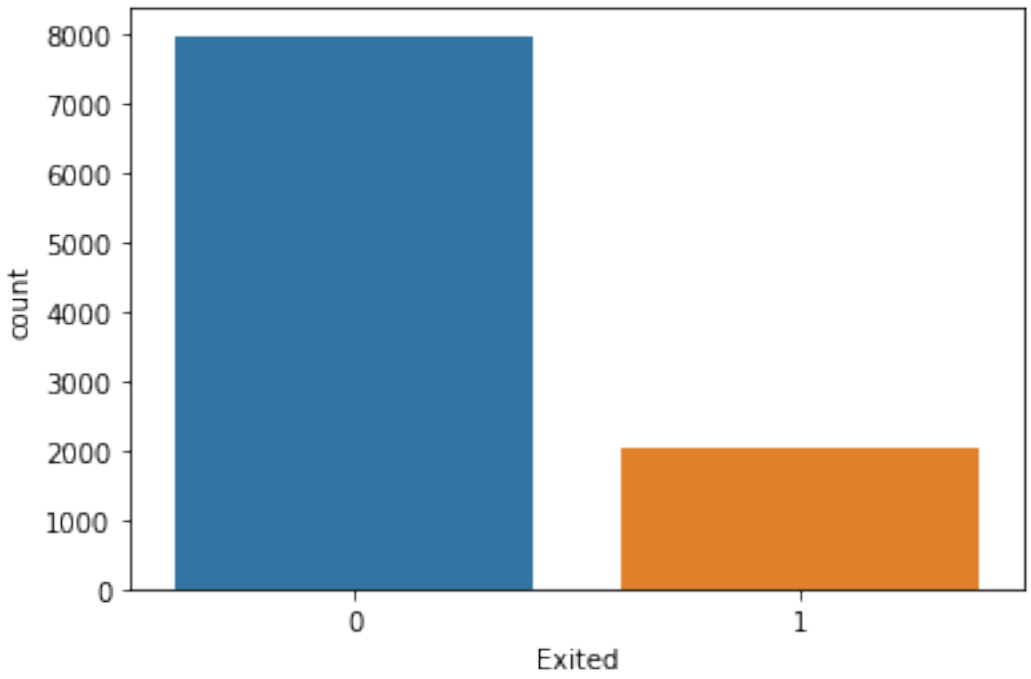


[24]:
```
print(min(f.EstimatedSalary))
print(max(f.EstimatedSalary))
```

```
11.58
199992.48
```

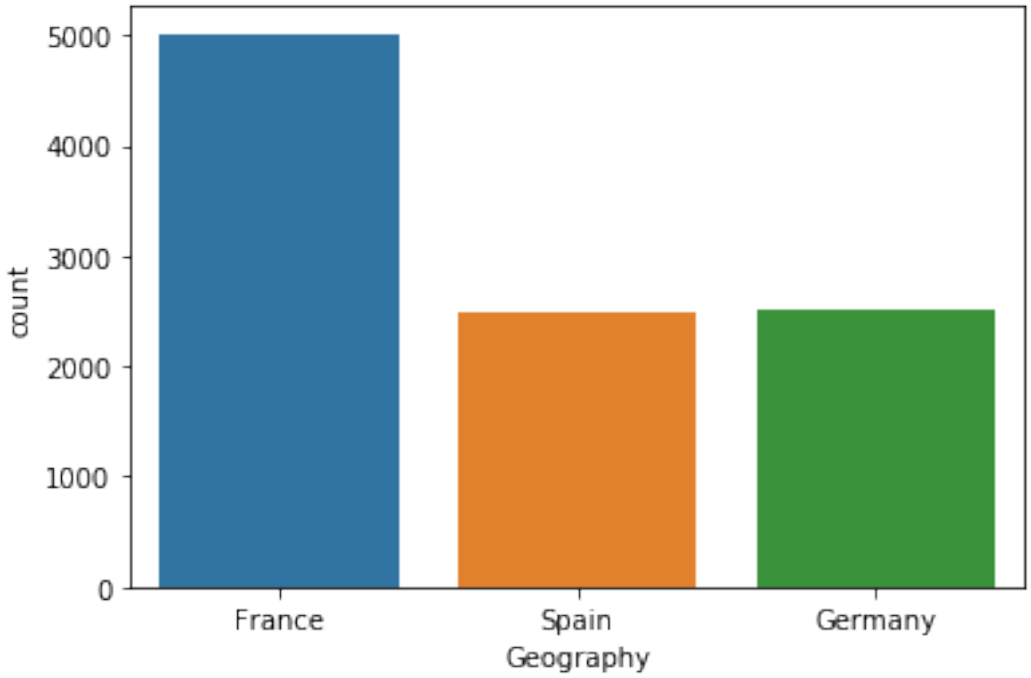
[25]:
```
sns.countplot(f.Exited)
```

[25]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1fbd690e0f0>
```



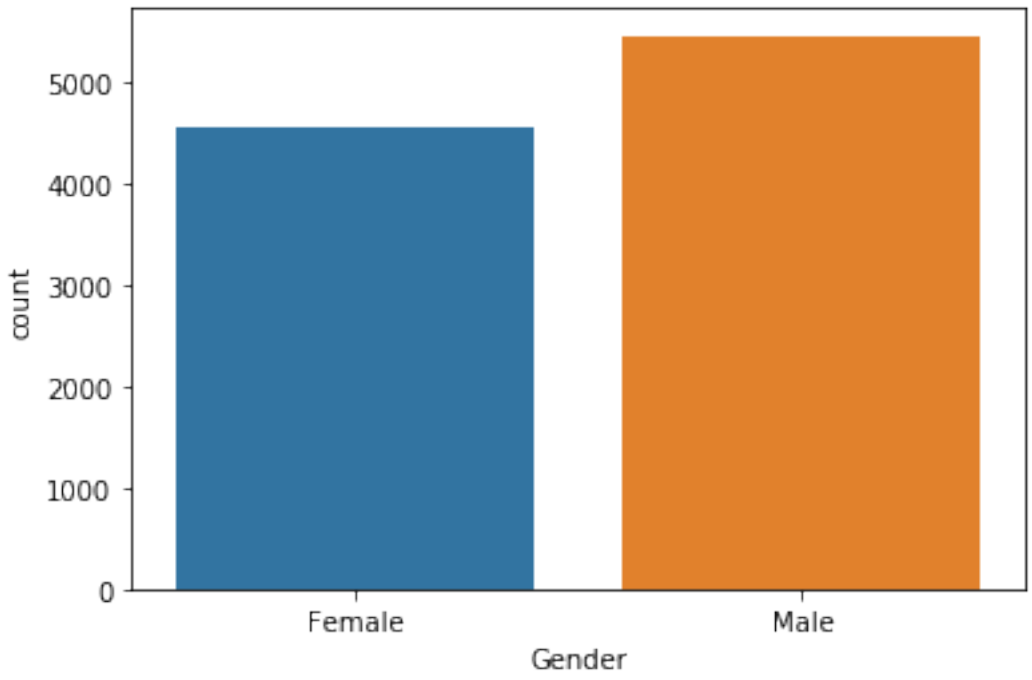
[26]:
```
sns.countplot(f.Geography)
```

[26]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1fbd68ac908>
```



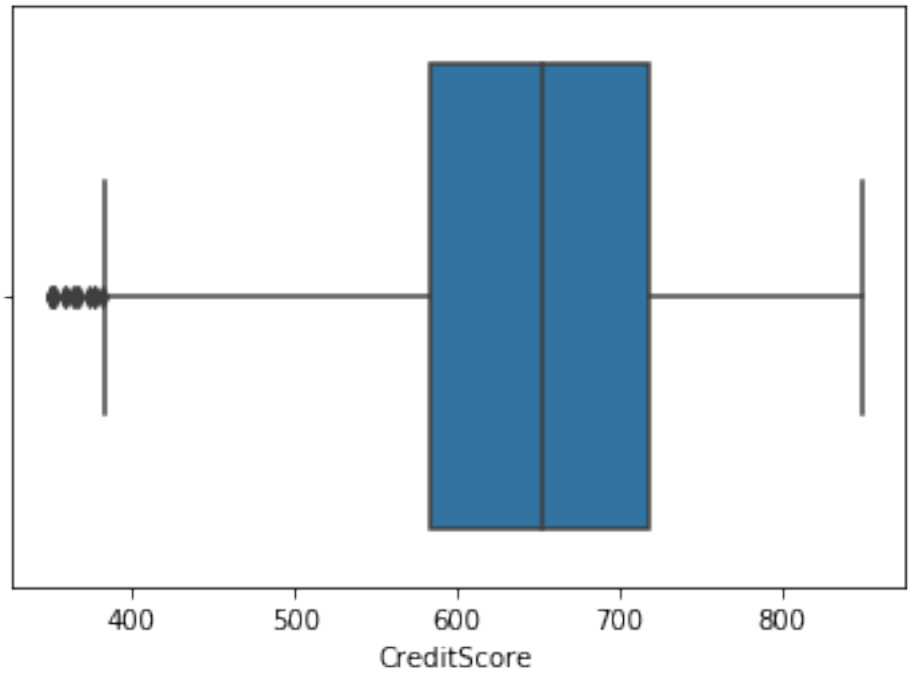
[27]:
```
sns.countplot(f.Gender)
```

[27]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1fbd699e2e8>
```



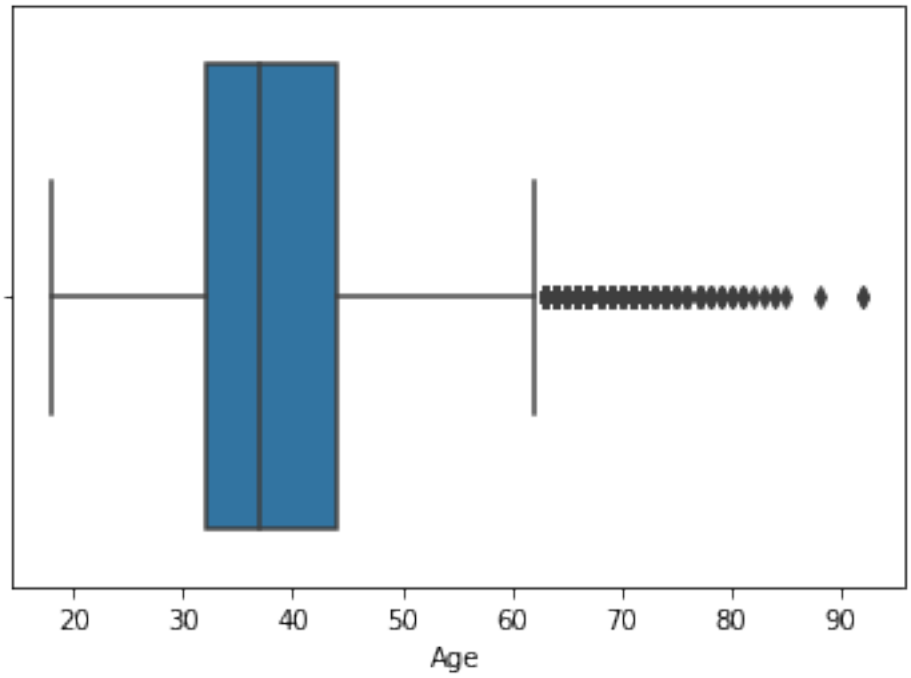
[34]:
```
sns.boxplot(x = "CreditScore", data = f)
```

[34]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1fbd6cc69b0>
```



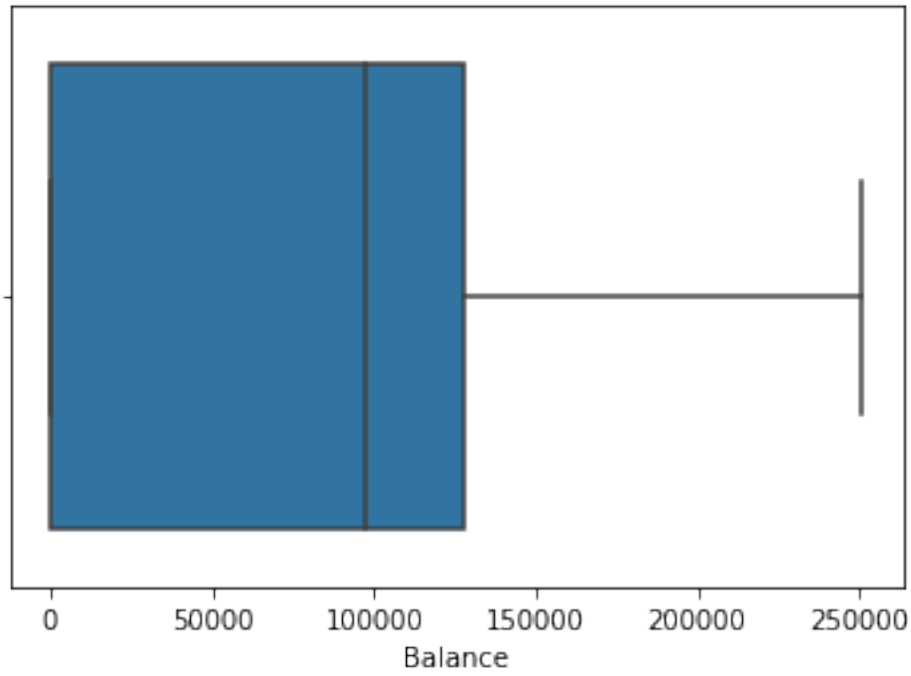
[35]:
```
sns.boxplot(x = "Age", data = f)
```

[35]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1fbd6d34ac8>
```



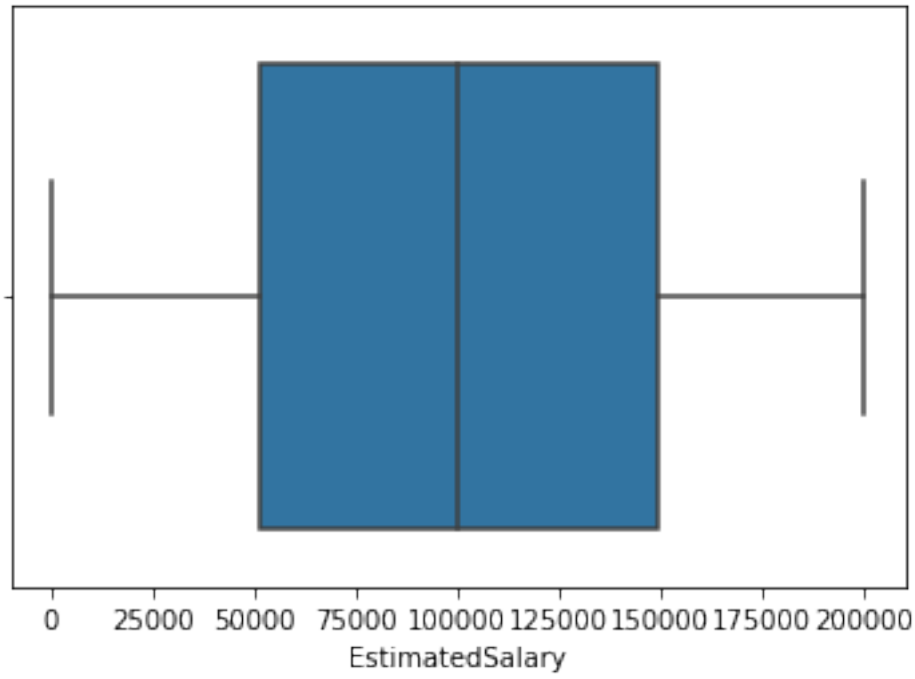
[36]:
```
sns.boxplot(x = "Balance", data = f)
```

[36]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1fbd6d99208>
```



[37]:
```
sns.boxplot(x = "EstimatedSalary", data = f)
```

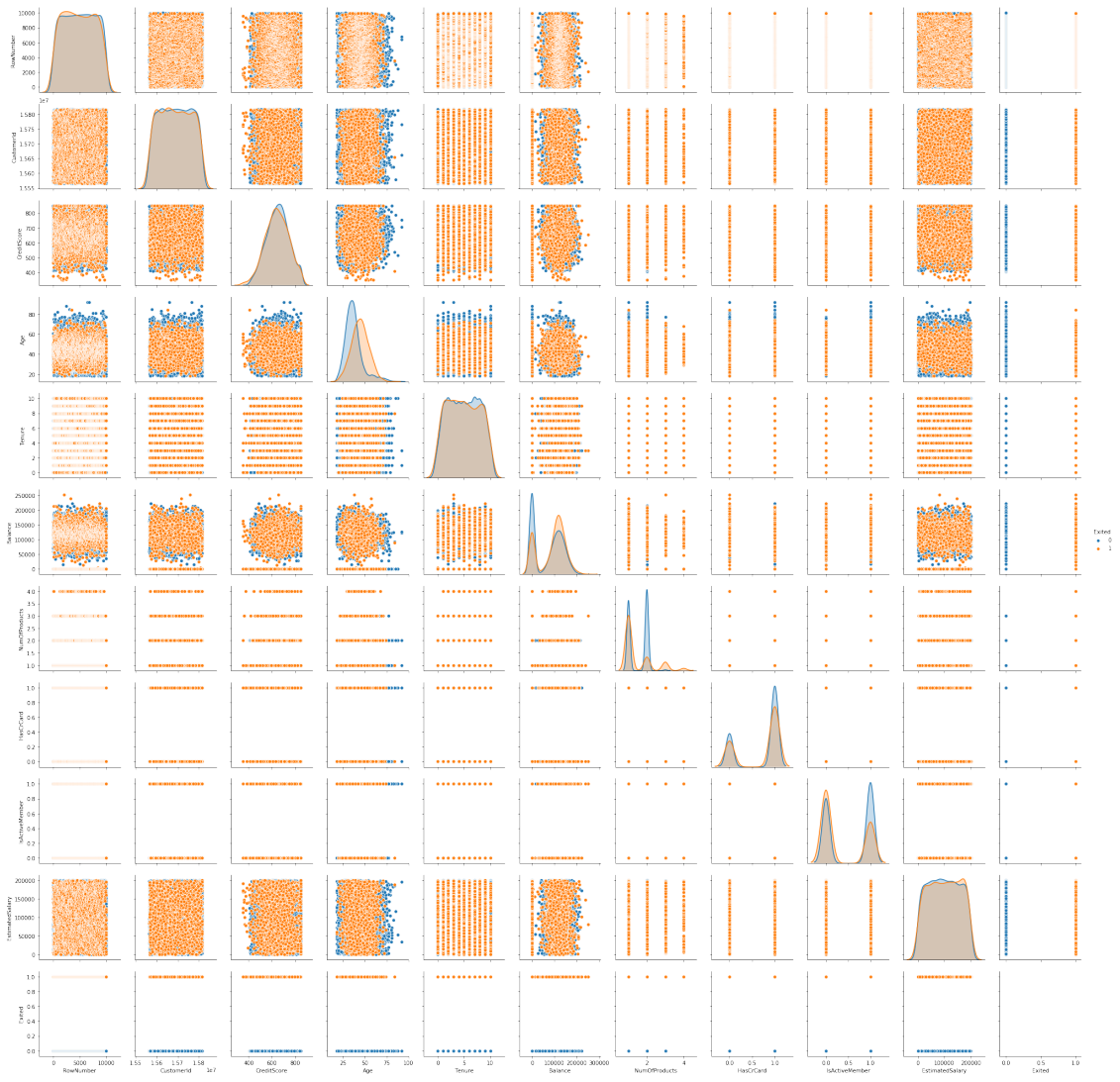
[37]:
```
<matplotlib.axes._subplots.AxesSubplot at 0x1fbd6dff278>
```



[43]:
```
sns.pairplot(f, hue = "Exited")
```

```
C:\Users\Panther\Anaconda3\lib\site-
packages\statsmodels\nonparametric\kde.py:487: RuntimeWarning: invalid value
encountered in true_divide
  binned = fast_linbin(X, a, b, gridsize) / (delta * nobs)
C:\Users\Panther\Anaconda3\lib\site-
packages\statsmodels\nonparametric\kdetools.py:34: RuntimeWarning: invalid value
encountered in double_scalars
  FAC1 = 2*(np.pi*bw/RANGE)**2
```

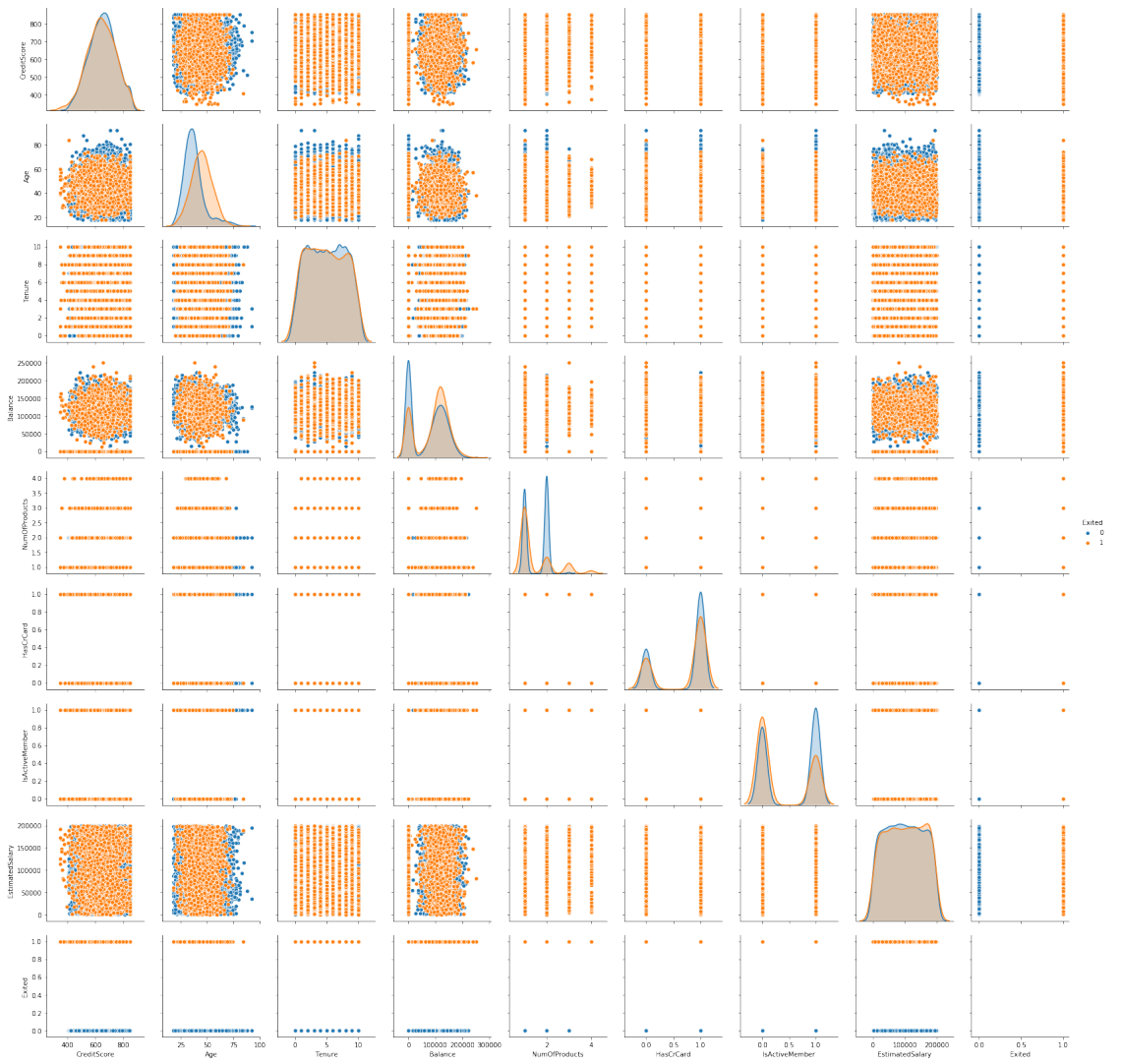
[43]:
```
<seaborn.axisgrid.PairGrid at 0x1fbd8569eb8>
```



[44]:
```
f_pairplot = f[['CreditScore', 'Geography', 'Age', 'Tenure', 'Balance',␣
 ↪'NumOfProducts', 'HasCrCard', 'IsActiveMember', 'EstimatedSalary', 'Exited']]
```

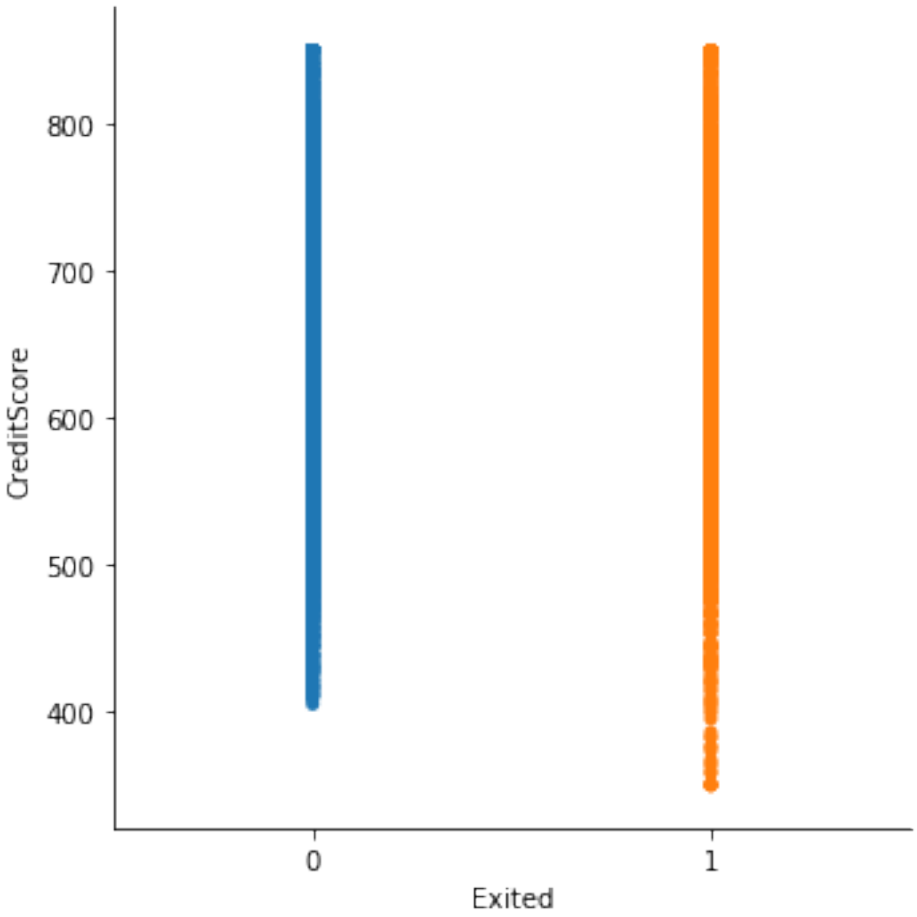
[45]:
```
sns.pairplot(f_pairplot, hue = "Exited")
```

[45]:
```
<seaborn.axisgrid.PairGrid at 0x1fbdebed978>
```



[62]:
```
sns.catplot(x = 'Exited', y = 'CreditScore', jitter = False, data = f)
```

[62]: <seaborn.axisgrid.FacetGrid at 0x1fbe8022048>



[64]:
```
pip install nbconvert
```

```
Requirement already satisfied: nbconvert in c:\users\panther\anaconda3\lib\site-
packages (5.5.0)
Requirement already satisfied: entrypoints>=0.2.2 in
c:\users\panther\anaconda3\lib\site-packages (from nbconvert) (0.3)
Requirement already satisfied: pandocfilters>=1.4.1 in
c:\users\panther\anaconda3\lib\site-packages (from nbconvert) (1.4.2)
Requirement already satisfied: nbformat>=4.4 in
c:\users\panther\anaconda3\lib\site-packages (from nbconvert) (4.4.0)
Requirement already satisfied: mistune>=0.8.1 in
c:\users\panther\anaconda3\lib\site-packages (from nbconvert) (0.8.4)
Requirement already satisfied: traitlets>=4.2 in
c:\users\panther\anaconda3\lib\site-packages (from nbconvert) (4.3.2)
Requirement already satisfied: jinja2>=2.4 in
c:\users\panther\anaconda3\lib\site-packages (from nbconvert) (2.10.1)
Requirement already satisfied: defusedxml in
c:\users\panther\anaconda3\lib\site-packages (from nbconvert) (0.6.0)
Requirement already satisfied: jupyter-core in
```

```
c:\users\panther\anaconda3\lib\site-packages (from nbconvert) (4.5.0)
Requirement already satisfied: testpath in c:\users\panther\anaconda3\lib\site-
packages (from nbconvert) (0.4.2)
Requirement already satisfied: bleach in c:\users\panther\anaconda3\lib\site-
packages (from nbconvert) (3.1.0)
Requirement already satisfied: pygments in c:\users\panther\anaconda3\lib\site-
packages (from nbconvert) (2.4.2)
Requirement already satisfied: ipython-genutils in
c:\users\panther\anaconda3\lib\site-packages (from nbformat>=4.4->nbconvert)
(0.2.0)
Requirement already satisfied: jsonschema!=2.5.0,>=2.4 in
c:\users\panther\anaconda3\lib\site-packages (from nbformat>=4.4->nbconvert)
(3.0.1)
Requirement already satisfied: decorator in c:\users\panther\anaconda3\lib\site-
packages (from traitlets>=4.2->nbconvert) (4.4.0)
Requirement already satisfied: six in c:\users\panther\anaconda3\lib\site-
packages (from traitlets>=4.2->nbconvert) (1.12.0)
Requirement already satisfied: MarkupSafe>=0.23 in
c:\users\panther\anaconda3\lib\site-packages (from jinja2>=2.4->nbconvert)
(1.1.1)
Requirement already satisfied: webencodings in
c:\users\panther\anaconda3\lib\site-packages (from bleach->nbconvert) (0.5.1)
Requirement already satisfied: attrs>=17.4.0 in
c:\users\panther\anaconda3\lib\site-packages (from
jsonschema!=2.5.0,>=2.4->nbformat>=4.4->nbconvert) (19.1.0)
Requirement already satisfied: pyrsistent>=0.14.0 in
c:\users\panther\anaconda3\lib\site-packages (from
jsonschema!=2.5.0,>=2.4->nbformat>=4.4->nbconvert) (0.14.11)
Requirement already satisfied: setuptools in
c:\users\panther\anaconda3\lib\site-packages (from
jsonschema!=2.5.0,>=2.4->nbformat>=4.4->nbconvert) (41.0.1)
Note: you may need to restart the kernel to use updated packages.
```

[ ]: