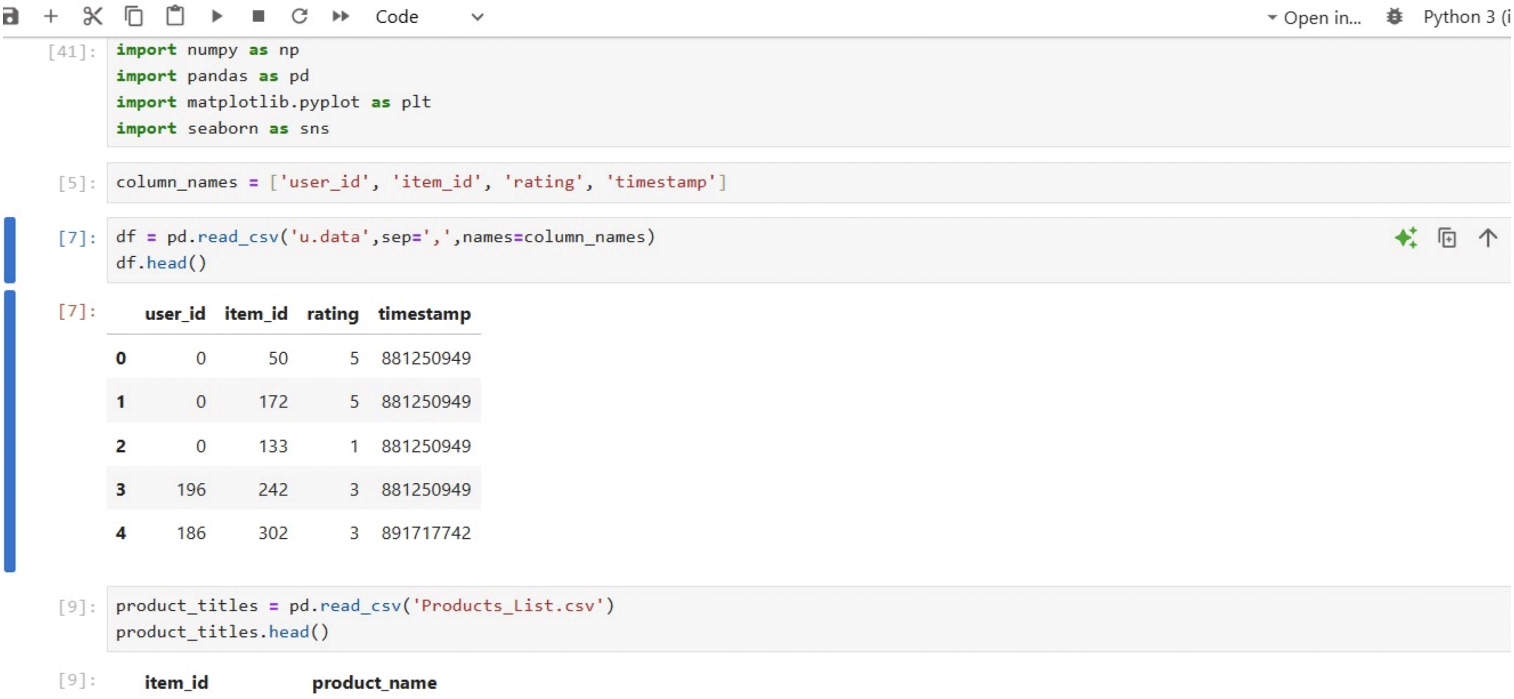


```
[41]: import numpy as np
      import pandas as pd
      import matplotlib.pyplot as plt
      import seaborn as sns
```

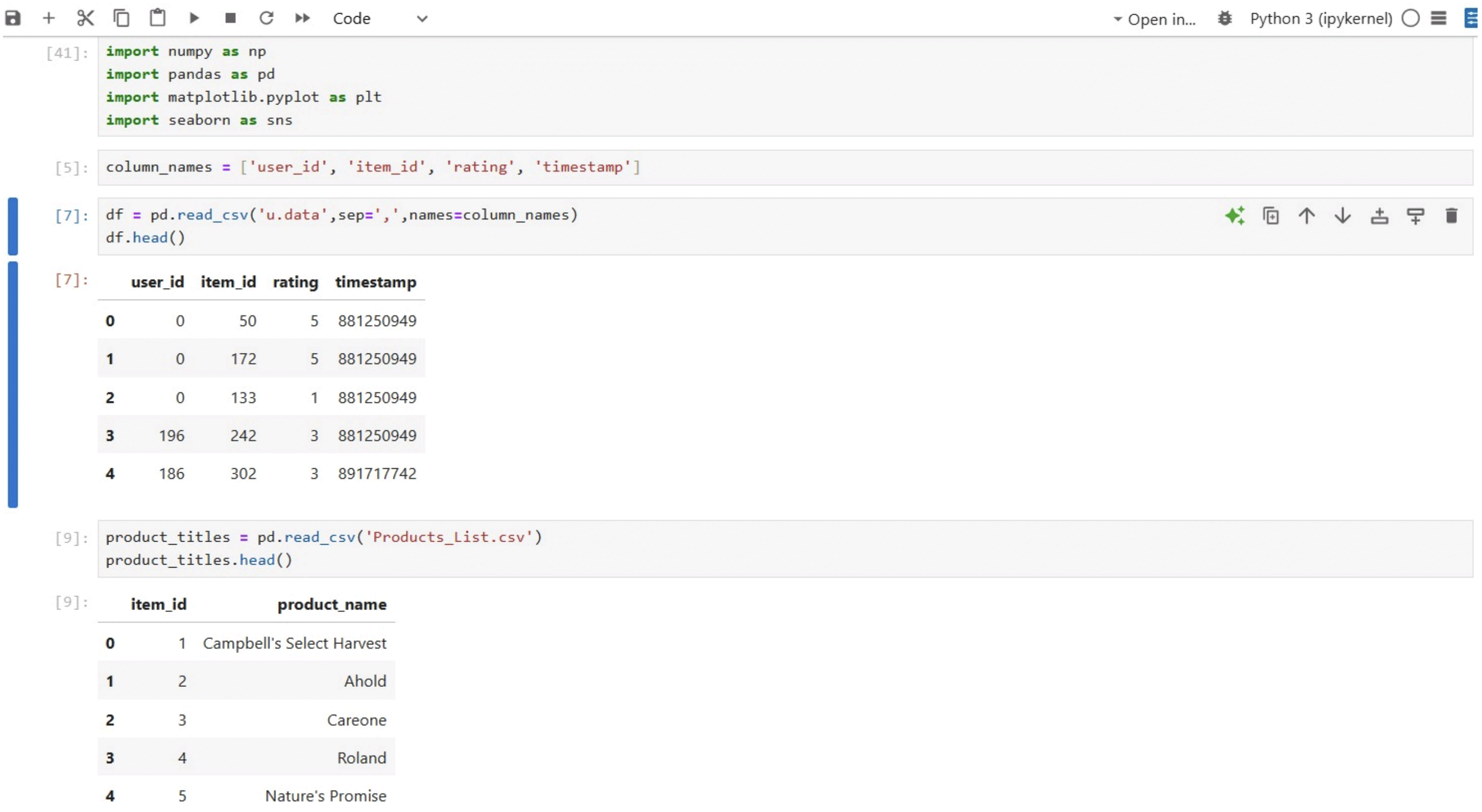
```
[5]: column_names = ['user_id', 'item_id', 'rating', 'timestamp']
```

```
[7]: df = pd.read_csv('u.data',sep=',',names=column_names)
     df.head()
```

```
[7]:    user_id  item_id  rating  timestamp
     0        0       50       5  881250949
     1        0      172       5  881250949
     2        0      133       1  881250949
     3      196      242       3  881250949
     4      186      302       3  891717742
```

```
[9]: product_titles = pd.read_csv('Products_List.csv')
     product_titles.head()
```

```
[9]:    item_id          product_name
```



[41]:

```python
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

[5]:

```python
column_names = ['user_id', 'item_id', 'rating', 'timestamp']
```

[7]:

```python
df = pd.read_csv('u.data',sep=',',names=column_names)
df.head()
```

[7]:

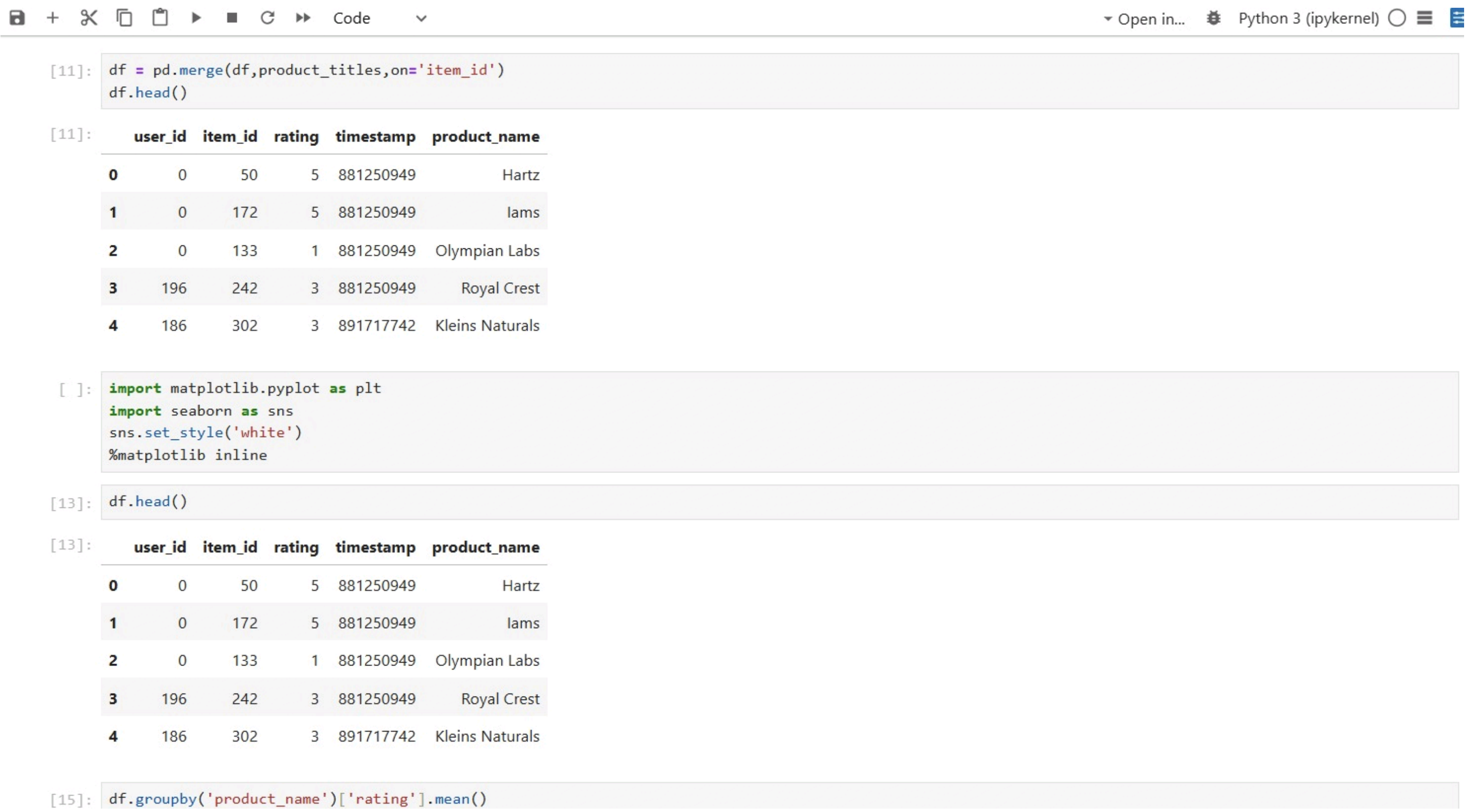
	user_id	item_id	rating	timestamp
0	0	50	5	881250949
1	0	172	5	881250949
2	0	133	1	881250949
3	196	242	3	881250949
4	186	302	3	891717742

[9]:

```python
product_titles = pd.read_csv('Products_List.csv')
product_titles.head()
```

[9]:

	item_id	product_name
0	1	Campbell's Select Harvest
1	2	Ahold
2	3	Careone
3	4	Roland
4	5	Nature's Promise



```
[11]: df = pd.merge(df,product_titles,on='item_id')
      df.head()
```

[11]:

	user_id	item_id	rating	timestamp	product_name
0	0	50	5	881250949	Hartz
1	0	172	5	881250949	Iams
2	0	133	1	881250949	Olympian Labs
3	196	242	3	881250949	Royal Crest
4	186	302	3	891717742	Kleins Naturals

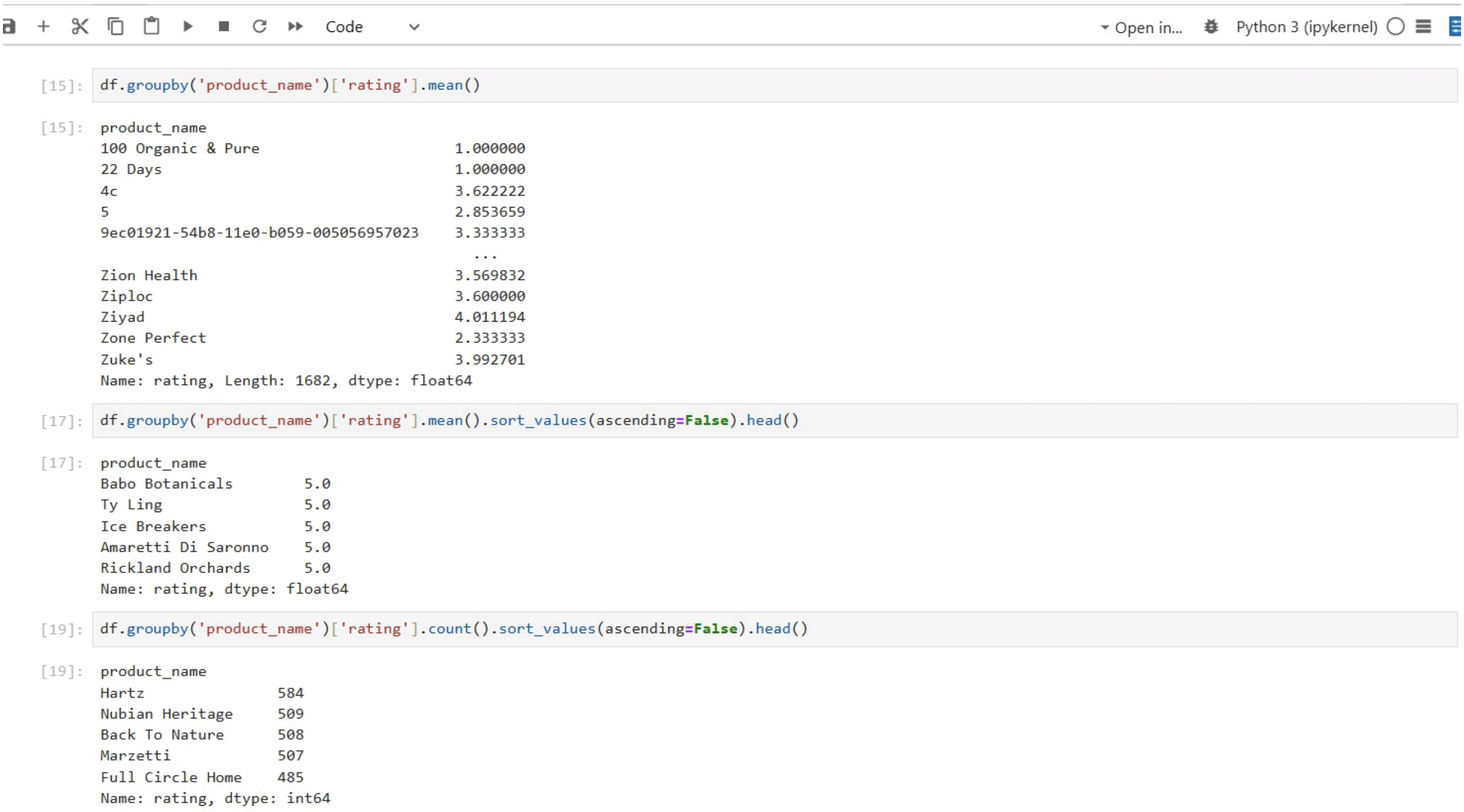
```
[ ]: import matplotlib.pyplot as plt
     import seaborn as sns
     sns.set_style('white')
     %matplotlib inline
```

```
[13]: df.head()
```

[13]:

	user_id	item_id	rating	timestamp	product_name
0	0	50	5	881250949	Hartz
1	0	172	5	881250949	Iams
2	0	133	1	881250949	Olympian Labs
3	196	242	3	881250949	Royal Crest
4	186	302	3	891717742	Kleins Naturals

```
[15]: df.groupby('product_name')['rating'].mean()
```



```
[15]: df.groupby('product_name')['rating'].mean()
```

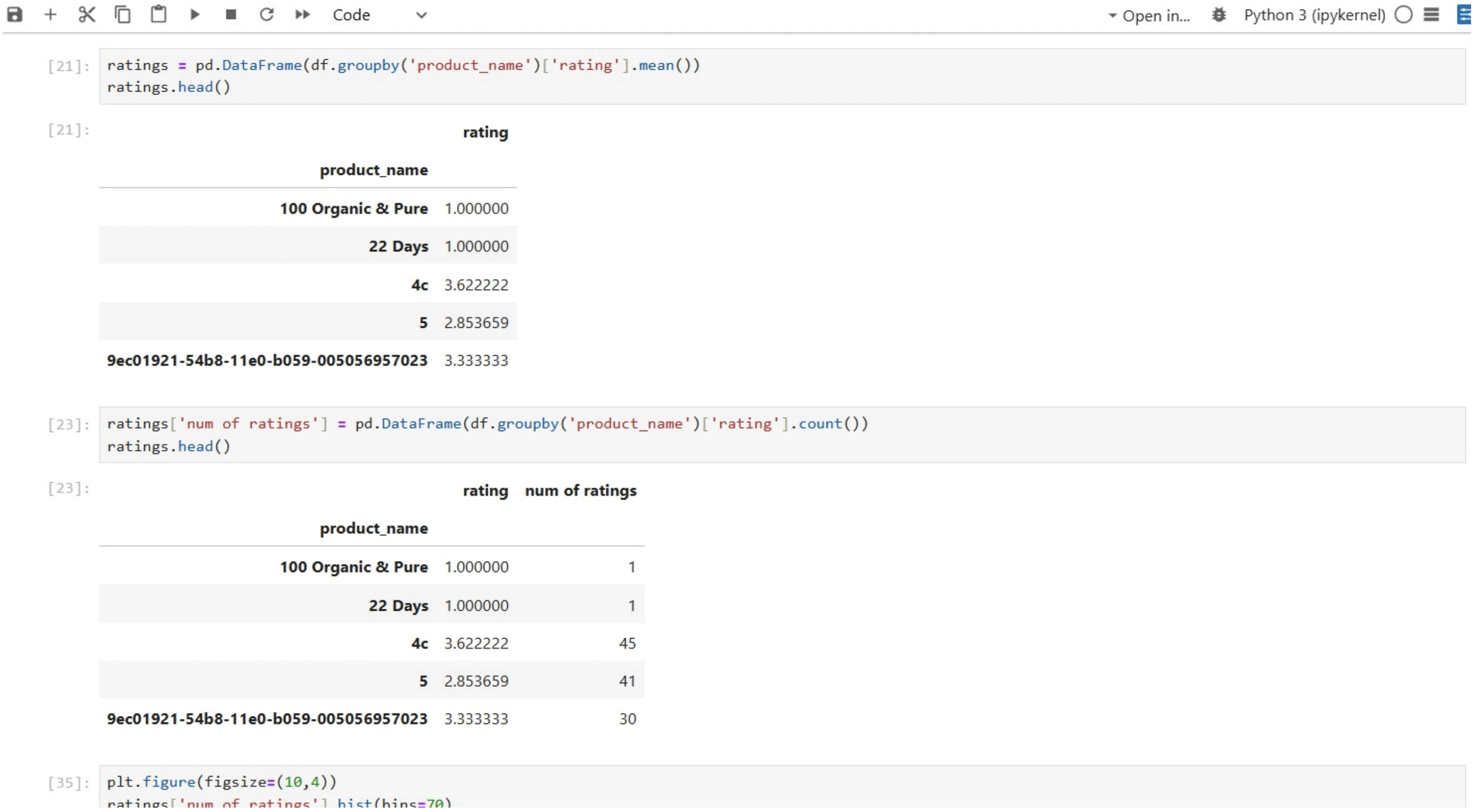
```
[15]: product_name
      100 Organic & Pure                        1.000000
      22 Days                                   1.000000
      4c                                        3.622222
      5                                         2.853659
      9ec01921-54b8-11e0-b059-005056957023      3.333333
                                                  ...
      Zion Health                               3.569832
      Ziploc                                    3.600000
      Ziyad                                     4.011194
      Zone Perfect                              2.333333
      Zuke's                                    3.992701
      Name: rating, Length: 1682, dtype: float64
```

```
[17]: df.groupby('product_name')['rating'].mean().sort_values(ascending=False).head()
```

```
[17]: product_name
      Babo Botanicals        5.0
      Ty Ling                5.0
      Ice Breakers           5.0
      Amaretti Di Saronno    5.0
      Rickland Orchards      5.0
      Name: rating, dtype: float64
```

```
[19]: df.groupby('product_name')['rating'].count().sort_values(ascending=False).head()
```

```
[19]: product_name
      Hartz               584
      Nubian Heritage     509
      Back To Nature      508
      Marzetti            507
      Full Circle Home    485
      Name: rating, dtype: int64
```



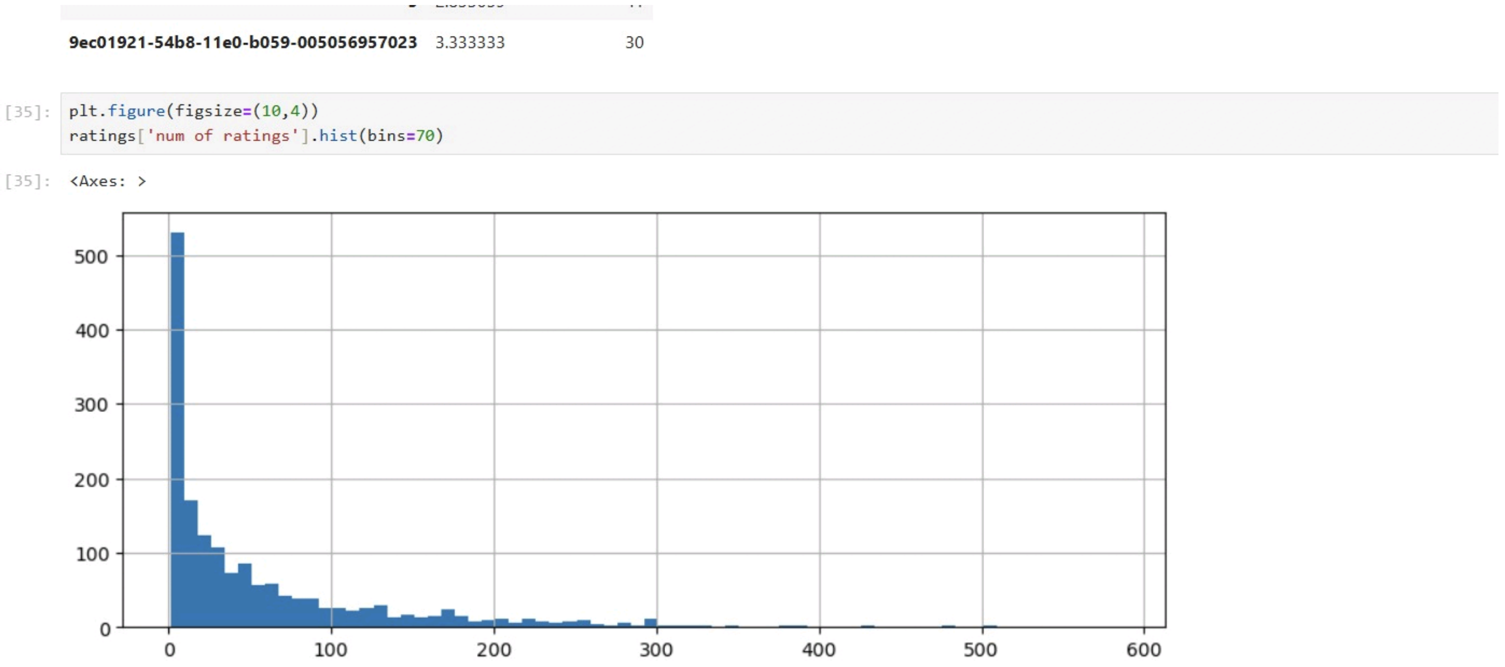
```
[21]: ratings = pd.DataFrame(df.groupby('product_name')['rating'].mean())
      ratings.head()
```

```
[21]:
                                            rating
                              product_name
                       100 Organic & Pure  1.000000
                                  22 Days  1.000000
                                       4c  3.622222
                                        5  2.853659
      9ec01921-54b8-11e0-b059-005056957023  3.333333
```

```
[23]: ratings['num of ratings'] = pd.DataFrame(df.groupby('product_name')['rating'].count())
      ratings.head()
```

```
[23]:
                                            rating  num of ratings
                              product_name
                       100 Organic & Pure  1.000000               1
                                  22 Days  1.000000               1
                                       4c  3.622222              45
                                        5  2.853659              41
      9ec01921-54b8-11e0-b059-005056957023  3.333333              30
```

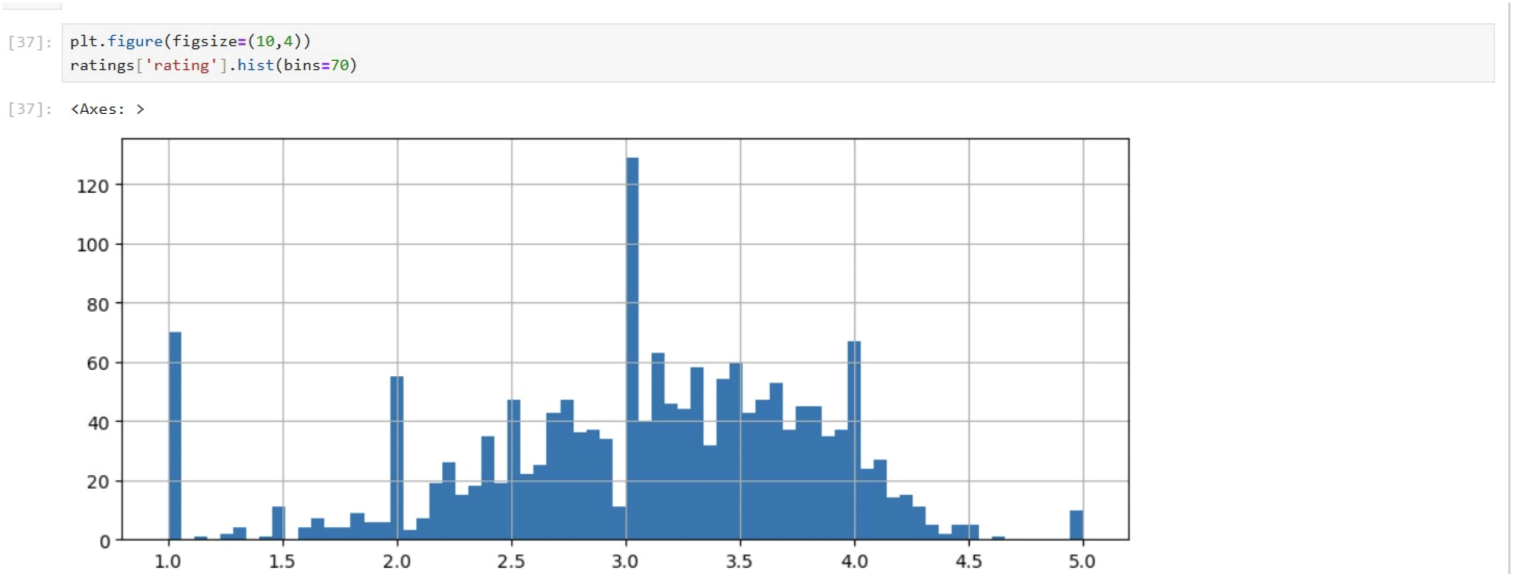
```
[35]: plt.figure(figsize=(10,4))
      ratings['num of ratings'].hist(bins=70)
```



9ec01921-54b8-11e0-b059-005056957023	3.333333	30

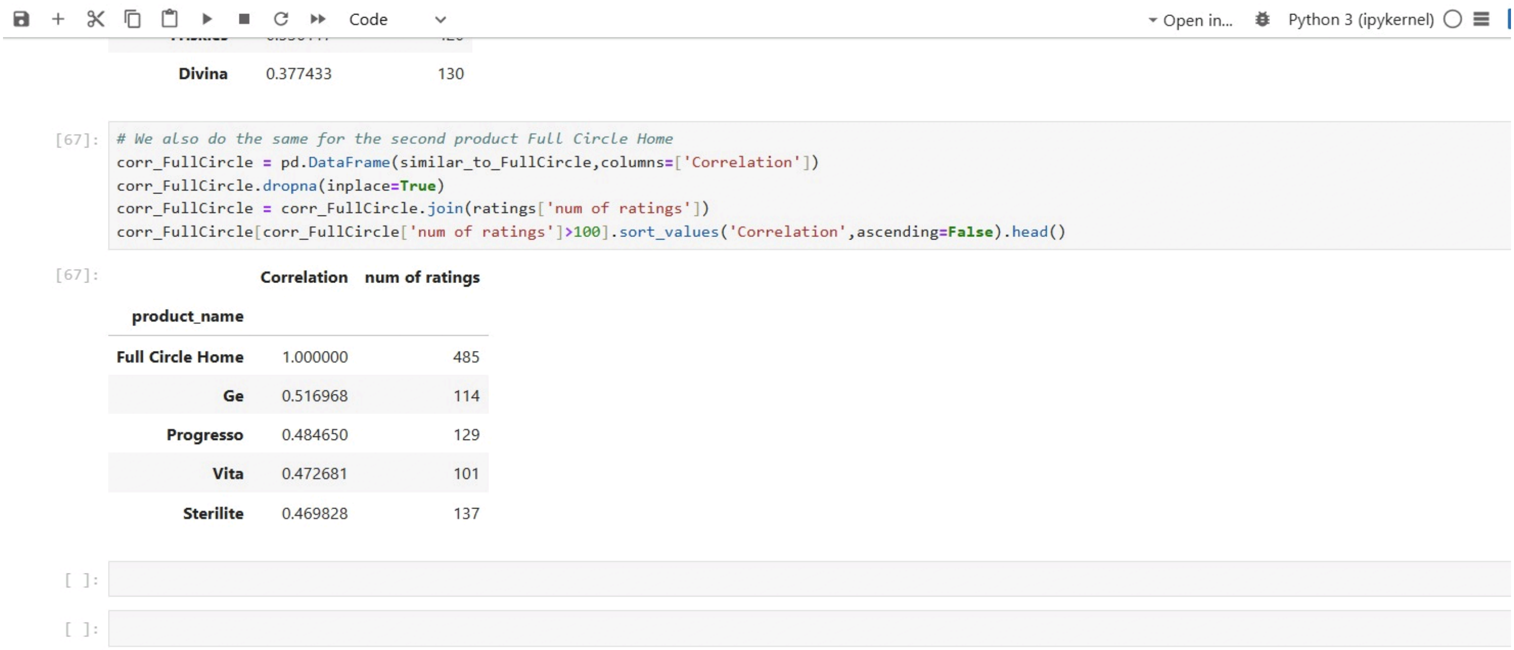
```
[35]: plt.figure(figsize=(10,4))
      ratings['num of ratings'].hist(bins=70)
```

```
[35]: <Axes: >
```



```
[37]: plt.figure(figsize=(10,4))
      ratings['rating'].hist(bins=70)
```

```
[37]: <Axes: >
```



Divina	0.377433	130

[67]:

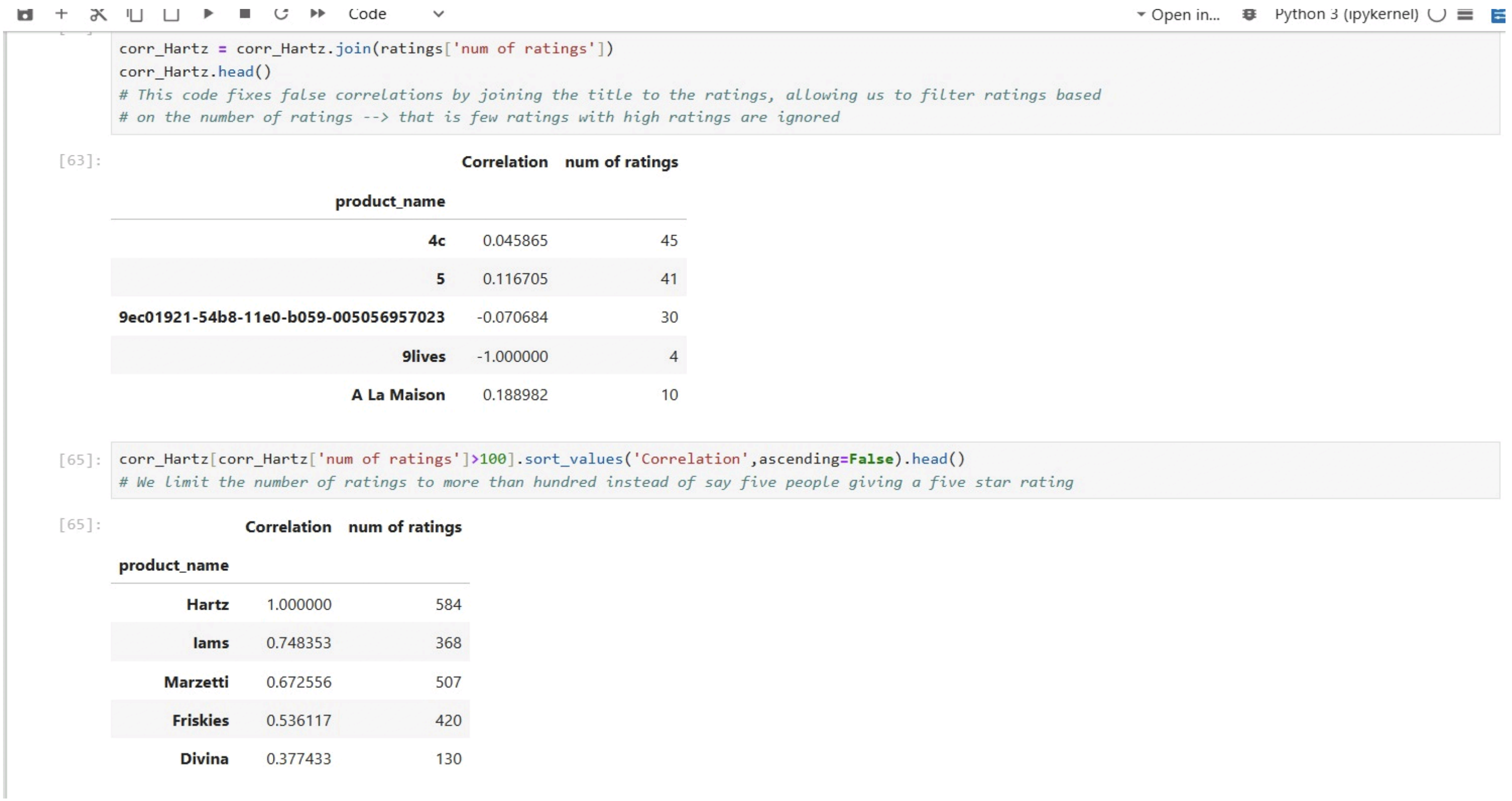
```python
# We also do the same for the second product Full Circle Home
corr_FullCircle = pd.DataFrame(similar_to_FullCircle,columns=['Correlation'])
corr_FullCircle.dropna(inplace=True)
corr_FullCircle = corr_FullCircle.join(ratings['num of ratings'])
corr_FullCircle[corr_FullCircle['num of ratings']>100].sort_values('Correlation',ascending=False).head()
```

[67]:

	Correlation	num of ratings
product_name		
Full Circle Home	1.000000	485
Ge	0.516968	114
Progresso	0.484650	129
Vita	0.472681	101
Sterilite	0.469828	137

[ ]:

[ ]:



```
corr_Hartz = corr_Hartz.join(ratings['num of ratings'])
corr_Hartz.head()
# This code fixes false correlations by joining the title to the ratings, allowing us to filter ratings based
# on the number of ratings --> that is few ratings with high ratings are ignored
```

[63]:

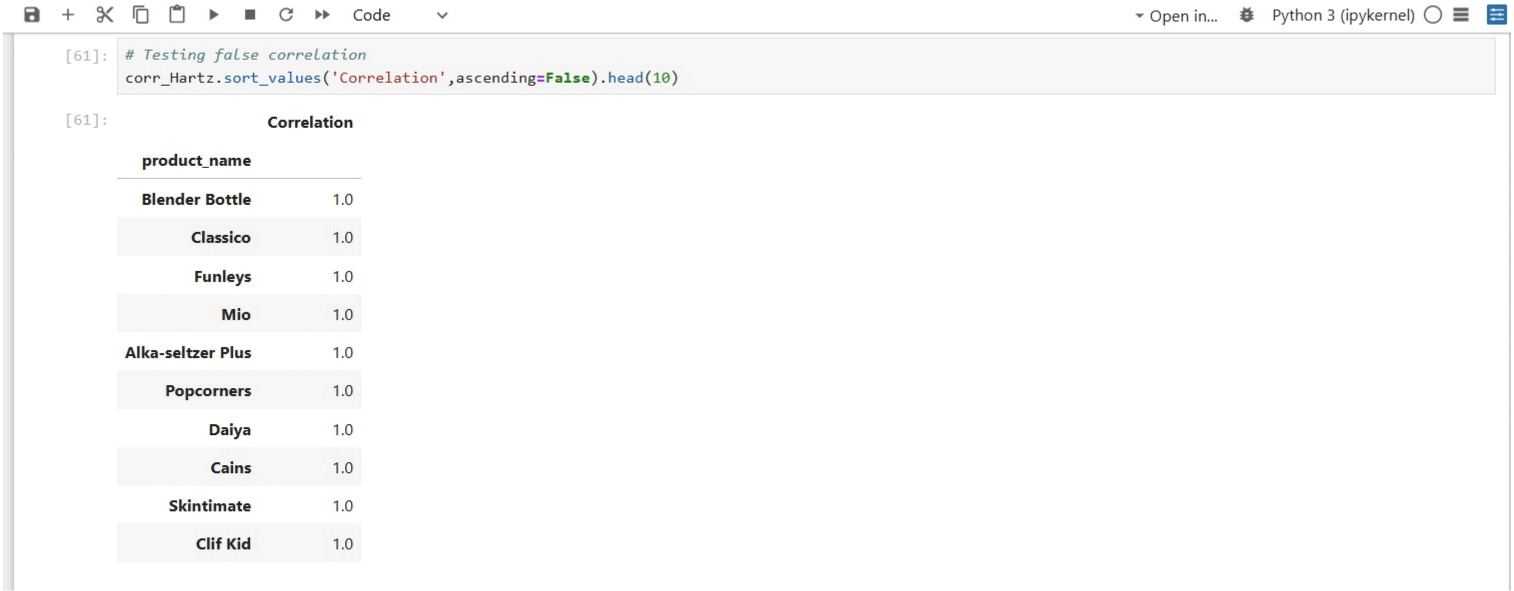
	Correlation	num of ratings
product_name		
4c	0.045865	45
5	0.116705	41
9ec01921-54b8-11e0-b059-005056957023	-0.070684	30
9lives	-1.000000	4
A La Maison	0.188982	10

[65]:

```
corr_Hartz[corr_Hartz['num of ratings']>100].sort_values('Correlation',ascending=False).head()
# We limit the number of ratings to more than hundred instead of say five people giving a five star rating
```

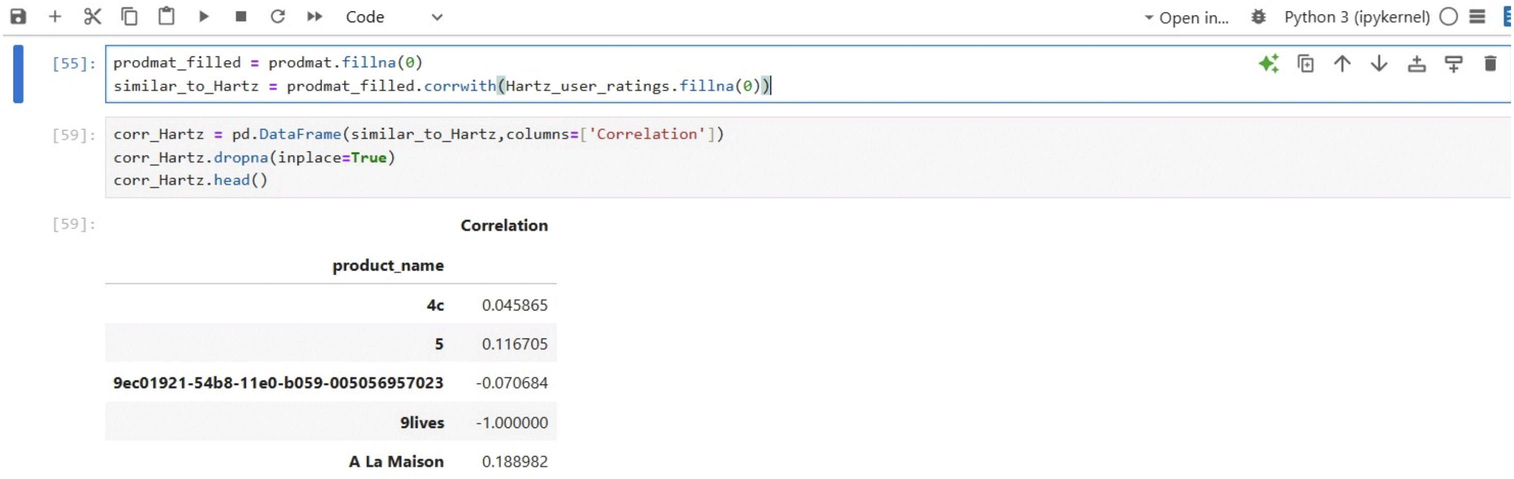
[65]:

	Correlation	num of ratings
product_name		
Hartz	1.000000	584
Iams	0.748353	368
Marzetti	0.672556	507
Friskies	0.536117	420
Divina	0.377433	130



```
[61]: # Testing false correlation
      corr_Hartz.sort_values('Correlation',ascending=False).head(10)
```

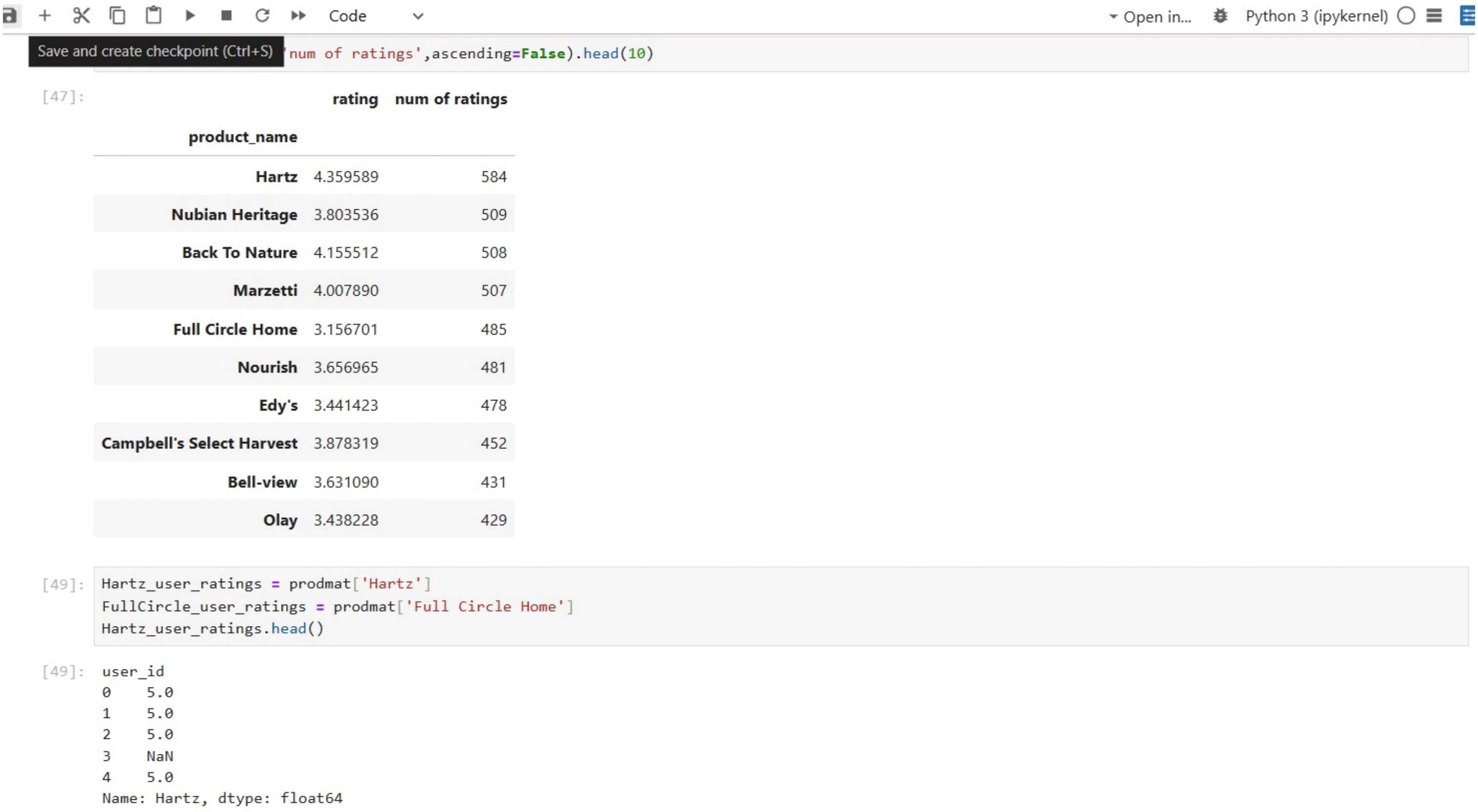
```
[61]:                  Correlation
        product_name
       Blender Bottle          1.0
             Classico          1.0
              Funleys          1.0
                  Mio          1.0
     Alka-seltzer Plus          1.0
           Popcorners          1.0
                Daiya          1.0
                Cains          1.0
           Skintimate          1.0
             Clif Kid          1.0
```



```
[55]: prodmat_filled = prodmat.fillna(0)
      similar_to_Hartz = prodmat_filled.corrwith(Hartz_user_ratings.fillna(0))
```

```
[59]: corr_Hartz = pd.DataFrame(similar_to_Hartz,columns=['Correlation'])
      corr_Hartz.dropna(inplace=True)
      corr_Hartz.head()
```

```
[59]:                               Correlation
                        product_name
                                  4c    0.045865
                                   5    0.116705
      9ec01921-54b8-11e0-b059-005056957023   -0.070684
                               9lives   -1.000000
                           A La Maison    0.188982
```



```
'num of ratings',ascending=False).head(10)
```

[47]:

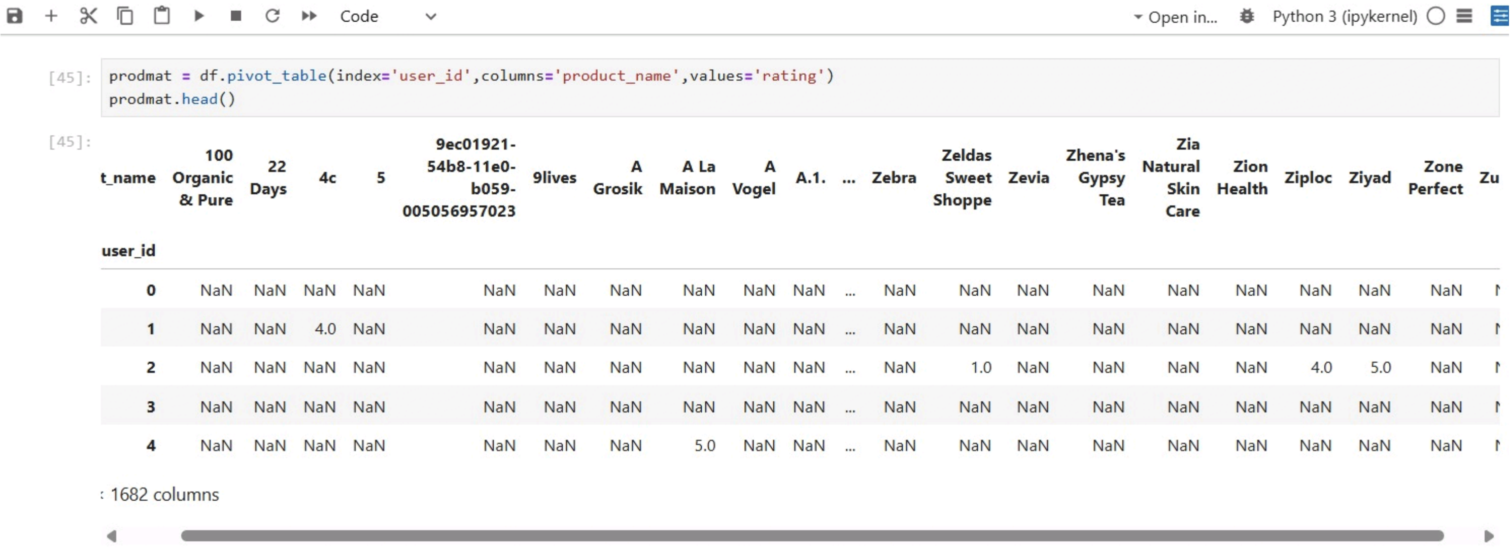
product_name	rating	num of ratings
Hartz	4.359589	584
Nubian Heritage	3.803536	509
Back To Nature	4.155512	508
Marzetti	4.007890	507
Full Circle Home	3.156701	485
Nourish	3.656965	481
Edy's	3.441423	478
Campbell's Select Harvest	3.878319	452
Bell-view	3.631090	431
Olay	3.438228	429

[49]:

```
Hartz_user_ratings = prodmat['Hartz']
FullCircle_user_ratings = prodmat['Full Circle Home']
Hartz_user_ratings.head()
```

[49]:

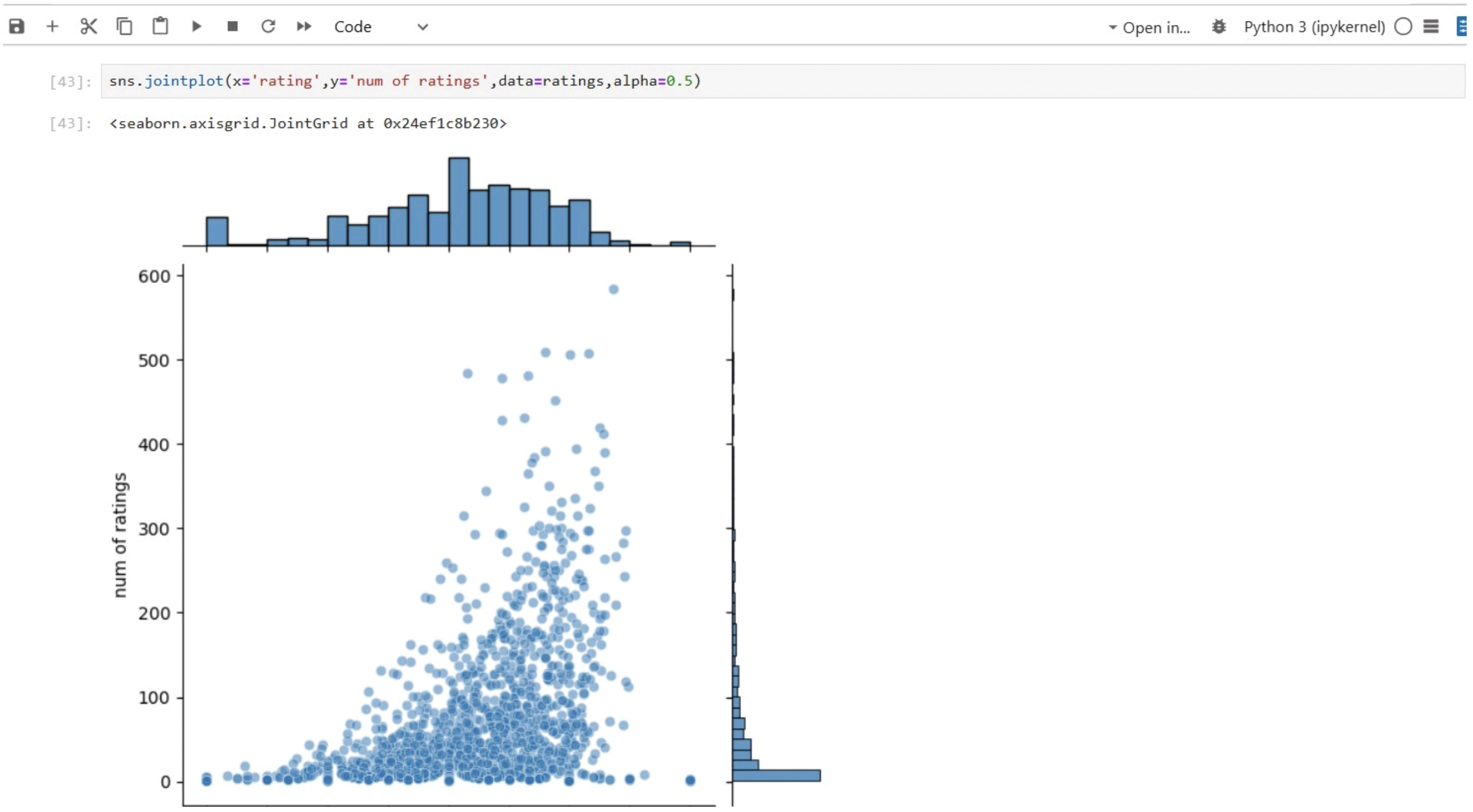
```
user_id
0    5.0
1    5.0
2    5.0
3    NaN
4    5.0
Name: Hartz, dtype: float64
```



```python
prodmat = df.pivot_table(index='user_id',columns='product_name',values='rating')
prodmat.head()
```

t_name	100 Organic & Pure	22 Days	4c	5	9ec01921-54b8-11e0-b059-005056957023	9lives	A Grosik	A La Maison	A Vogel	A.1.	...	Zebra	Zeldas Sweet Shoppe	Zevia	Zhena's Gypsy Tea	Zia Natural Skin Care	Zion Health	Ziploc	Ziyad	Zone Perfect	Zu
user_id																					
0	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	N
1	NaN	NaN	4.0	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	N
2	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN	1.0	NaN	NaN	NaN	NaN	4.0	5.0	NaN	N
3	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	N
4	NaN	NaN	NaN	NaN	NaN	NaN	NaN	5.0	NaN	NaN	...	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	N

: 1682 columns



```
[43]: sns.jointplot(x='rating',y='num of ratings',data=ratings,alpha=0.5)
```

```
[43]: <seaborn.axisgrid.JointGrid at 0x24ef1c8b230>
```