Amazon_Analysis_PF

May 24, 2017

In [1]:
```
import pandas as pd
import numpy as np
import csv
import os
import re

%matplotlib inline
import matplotlib
import matplotlib.pylab as plt
from matplotlib import rc
rc('font', **{'family': 'serif', 'serif': ['Computer Modern']})
rc('text', usetex=True)
matplotlib.rcParams.update({'font.size': 16})
```

In [5]:
```
##Reads text file and generates csv with ID, ASIN, group, salesrank, number

Input_file = 'amazon-meta.txt'
Output_file = 'amazon_data_full.csv'
header = [
    "Id",
    "ASIN",
    "group",
    "salesrank"]


with open(Output_file, 'w') as output:
    writer = csv.writer(output)
    writer.writerow(['Id', 'ASIN', 'group', 'salesrank', 'number of reviews


    with open(Input_file) as f:
        data = [None] * 6
        for line in f:
            line = line.strip()
            if line == "":
                #print(data)
                writer.writerow([data[0],data[1],data[2],data[3],data[4],da
```

```
                    data = [None] * 6
                    continue
                parts = line.split(": ",1)
                for i in range(len(header)):
                    if parts[0] == header[i]:
                        data[i] = parts[1]
                if parts[0] == 'reviews':
                    a = re.findall(r'[-+]?\d*\.\d+|\d+', parts[1])
                    data[4] = a[0]
                    data[5] = a[2]
```

```
In [39]: file = 'amazon_data_full.csv'
         df = pd.read_csv(file);
         df = df.dropna(subset = ['number of reviews','average rating'])
         df.head()
```

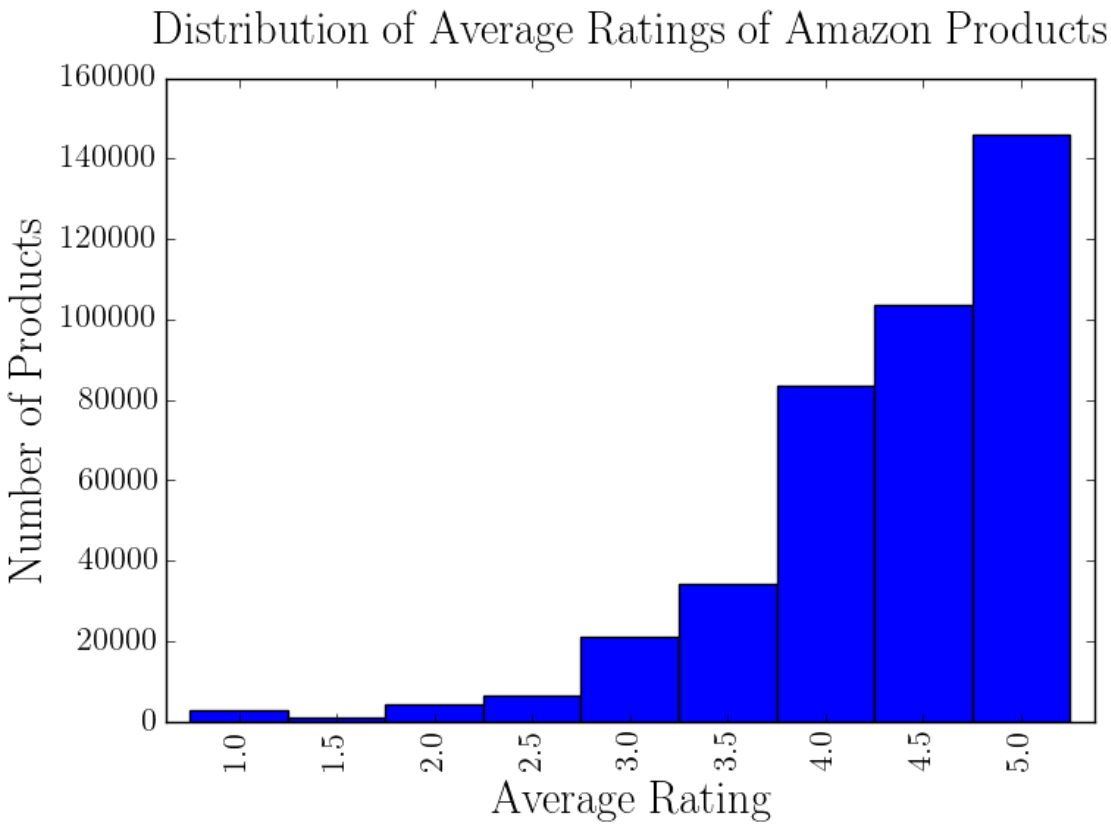
Out[39]:

	Id	ASIN	group	salesrank	number of reviews	average rating
2	1.0	0827229534	Book	396585.0	2.0	5.0
3	2.0	0738700797	Book	168596.0	12.0	4.5
4	3.0	0486287785	Book	1270652.0	1.0	5.0
5	4.0	0842328327	Book	631289.0	1.0	4.0
6	5.0	1577943082	Book	455160.0	0.0	0.0

```
In [114]: df_reviews = df.ix[df['number of reviews'] > 0]
          review_counts = df_reviews["average rating"].value_counts(dropna=False).s
          review_counts
```

```
Out[114]: 1.0      2732
          1.5       837
          2.0      4117
          2.5      6561
          3.0     21227
          3.5     34405
          4.0     83458
          4.5    103563
          5.0    145835
          Name: average rating, dtype: int64
```

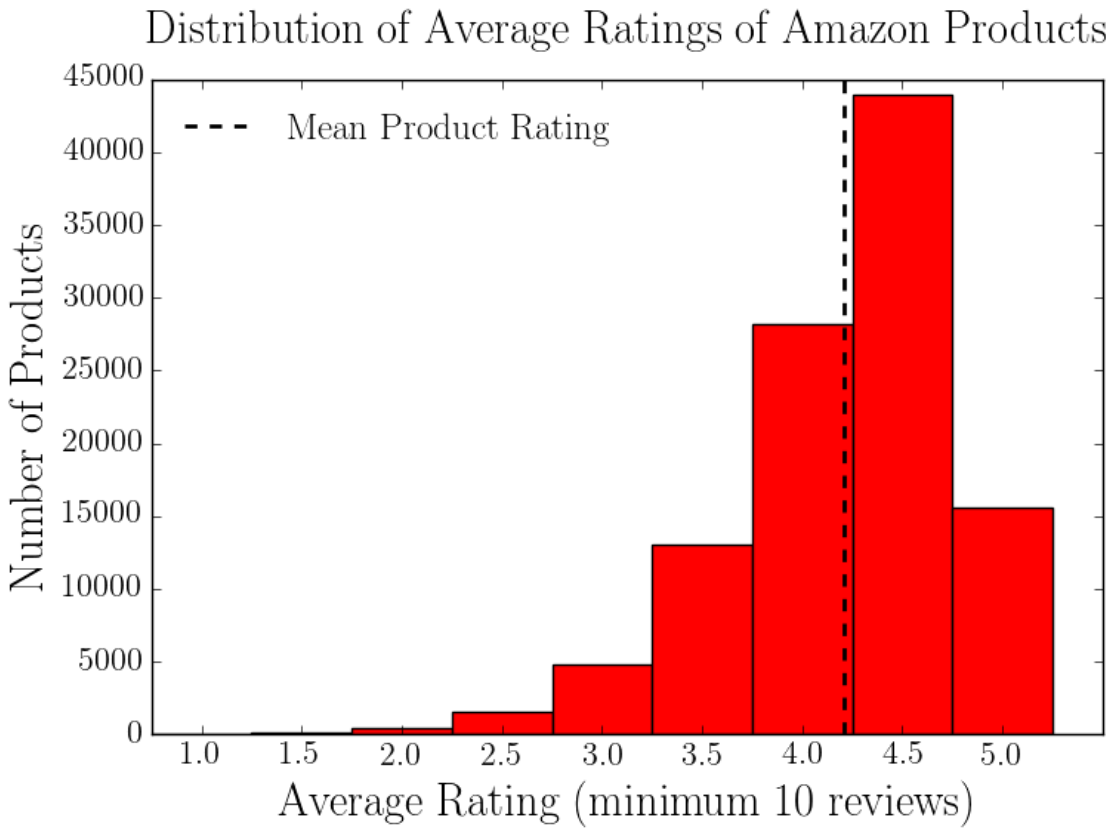
```
In [115]: figure = plt.figure(num=None, figsize=(8, 6), dpi=600, facecolor='w', edg
          plt.xlabel('Average Rating',fontsize=22)
          plt.ylabel('Number of Products',fontsize=22)
          plt.title('Distribution of Average Ratings of Amazon Products',fontsize=2
          review_counts.plot(kind='bar',width =1.0)
          plt.tight_layout()
          plt.savefig("Fig1.pdf",format="pdf")
          plt.show()
```




```
In [287]: df_reviews = df.ix[df['number of reviews'] > 10]
          review_counts = df_reviews["average rating"].value_counts(dropna=False).s
          avg_review = df_reviews['average rating'].mean()
          print(avg_review)

          figure = plt.figure(num=None, figsize=(8, 6), dpi=600, facecolor='w', edg
          plt.xlabel('Average Rating (minimum 10 reviews)',fontsize=22)
          plt.ylabel('Number of Products',fontsize=22)
          plt.title('Distribution of Average Ratings of Amazon Products',fontsize=2
          plt.bar(np.arange(1,5.5,0.5),np.array(review_counts),0.5,color='r',align
          ys = np.linspace(ymin,ymax,4)
          plt.plot(avg_review*np.ones(len(ys)),ys,'--k',linewidth = 2,label = 'Mean
          plt.xlim([0.75,5.5])
          plt.xticks(np.arange(1,5.5,0.5))
          plt.legend(frameon = False,numpoints = 1,fontsize=18,loc =2)
          plt.tight_layout()
          plt.savefig("Fig2.pdf",format="pdf")

4.210996279837834
```




```
In [42]: file = 'amazon_data_full.csv'
         df = pd.read_csv(file);
         df = df.ix[df['number of reviews'] > 0]
         #df.head()
```

Out[42]:

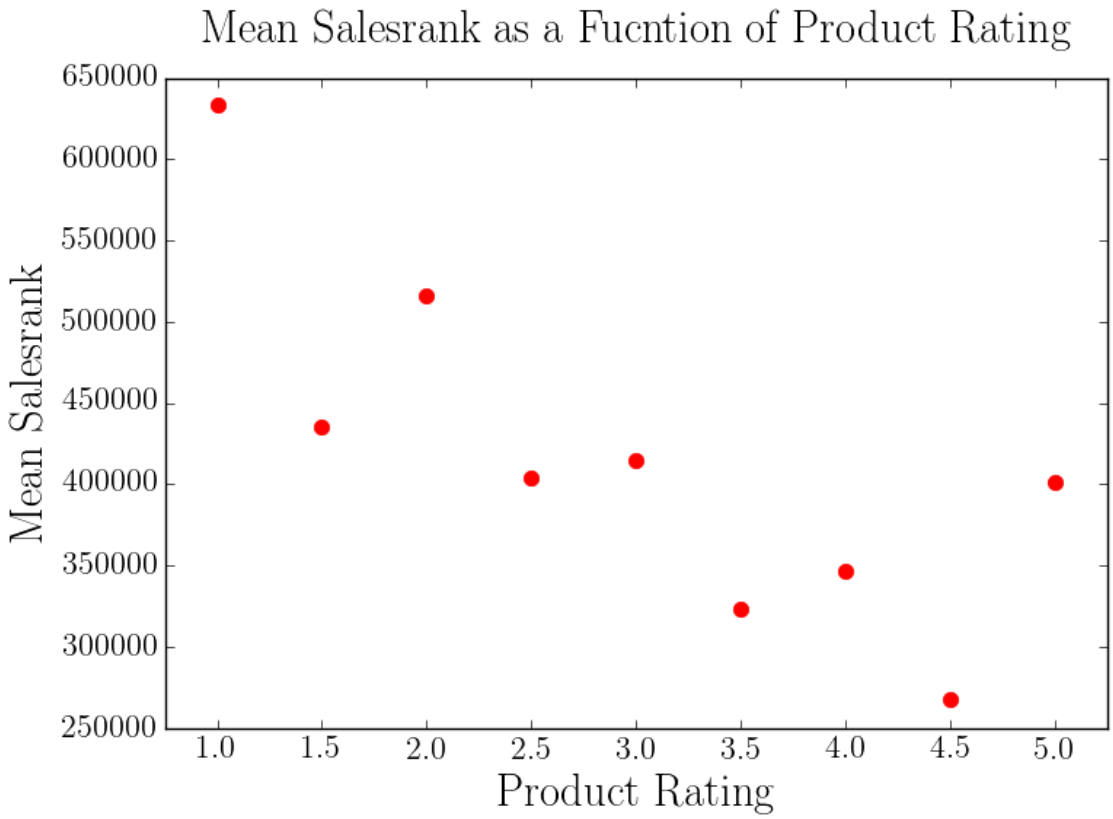
	Id	ASIN	group	salesrank	number of reviews	average rating
2	1.0	0827229534	Book	396585.0	2.0	5.0
3	2.0	0738700797	Book	168596.0	12.0	4.5
4	3.0	0486287785	Book	1270652.0	1.0	5.0
5	4.0	0842328327	Book	631289.0	1.0	4.0
7	6.0	0486220125	Book	188784.0	17.0	4.0

```
In [27]: grouped = df.groupby('number of reviews')
         dat = grouped["average rating"].agg(np.mean)
```

```
In [4]: file = 'amazon_data_full.csv'
        df = pd.read_csv(file);
        df = df.ix[df['number of reviews'] > 0]
        df = df[df['salesrank']>0]
        #df
```

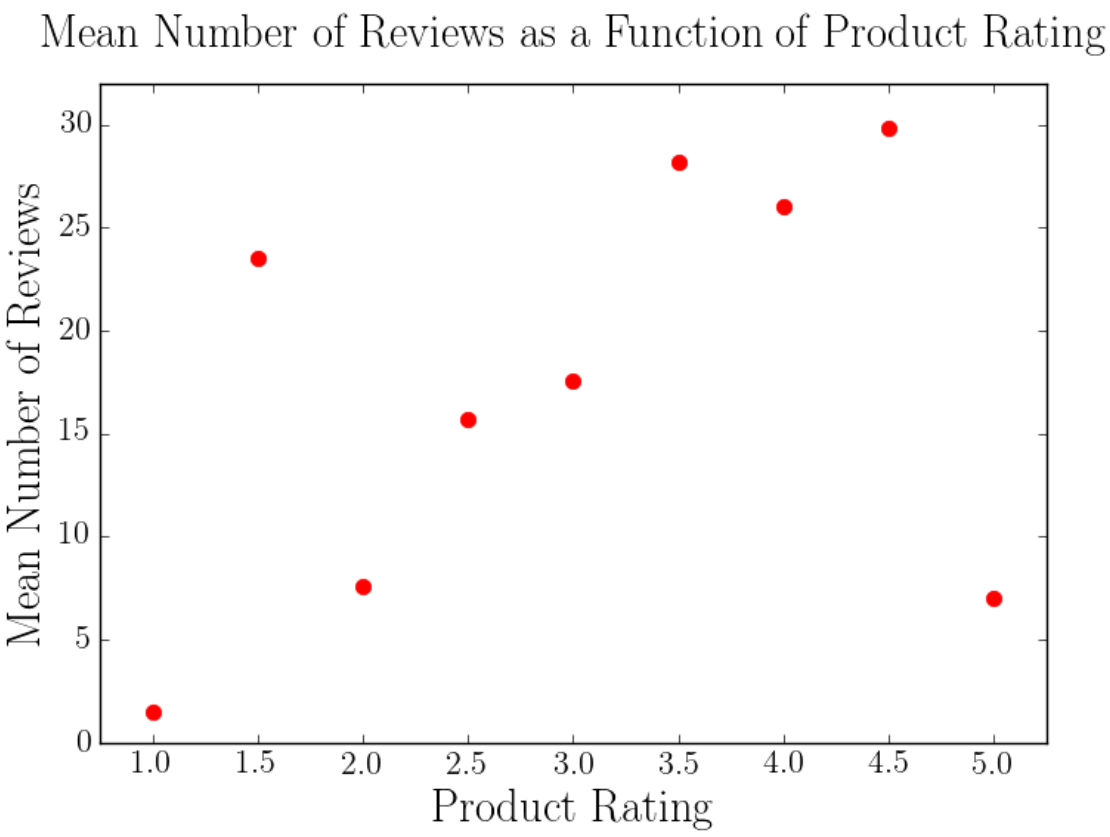
```
In [514]: grouped = df.groupby('average rating')
          grouped.size()
          dat1 = grouped["salesrank"].agg(np.mean)
          dat2 = grouped['number of reviews'].agg(np.mean)
```

```
In [587]: figure = plt.figure(num=None, figsize=(8, 6), dpi=300, facecolor='w', edg
          plt.plot(dat1,'.r',markersize = 15)
          plt.xlabel('Product Rating',fontsize=22)
          plt.ylabel('Mean Salesrank',fontsize=22)
          plt.title('Mean Salesrank as a Fucntion of Product Rating',fontsize=22,y=
          plt.xlim([0.75,5.25])
          plt.xticks(np.arange(1,5.5,0.5))
          plt.tight_layout()
          plt.savefig("Fig5.pdf",format="pdf")
          plt.show()
```

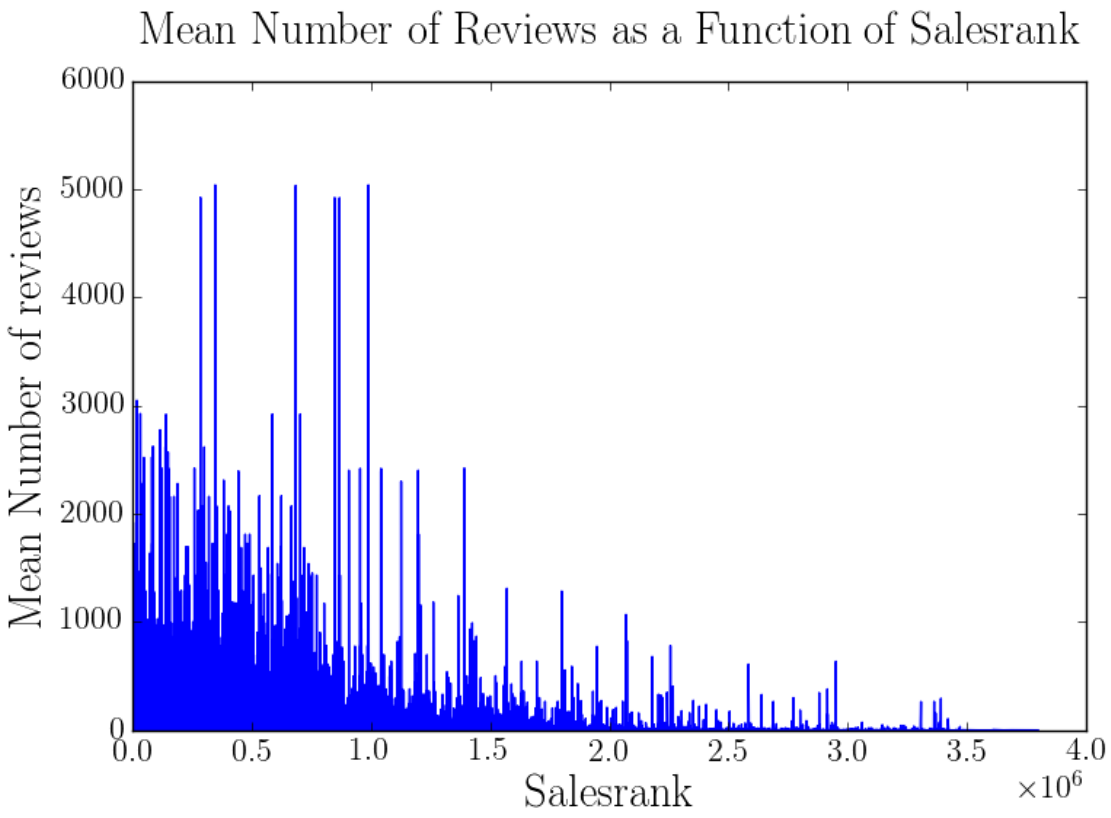



```
In [586]: figure = plt.figure(num=None, figsize=(8, 6), dpi=300, facecolor='w', edg
          plt.plot(dat2,'.r',markersize = 15)
          plt.xlabel('Product Rating',fontsize=22)
          plt.ylabel('Mean Number of Reviews',fontsize=22)
          plt.title('Mean Number of Reviews as a Function of Product Rating',fontsi
```

```
plt.xlim([0.75,5.25])
plt.ylim([0, 32])
plt.xticks(np.arange(1,5.5,0.5))
plt.tight_layout()
plt.savefig("Fig6.pdf",format="pdf")
plt.show()
```



In [13]:
```
grouped = df.groupby('salesrank')
dat = grouped["number of reviews"].agg(np.mean)
figure = plt.figure(num=None, figsize=(8, 6), dpi=300, facecolor='w', edge
plt.plot(dat,'b')
plt.xlabel('Salesrank', fontsize = 22)
plt.ylabel('Mean Number of reviews',fontsize = 22)
plt.title('Mean Number of Reviews as a Function of Salesrank',fontsize=22,
#plt.xticks(np.arange(1000000,5000000,1000000))
plt.ticklabel_format(style='sci', axis='x',scilimits=(0,0))
plt.tight_layout()
plt.savefig("Fig7.pdf",format="pdf")
plt.show()
```



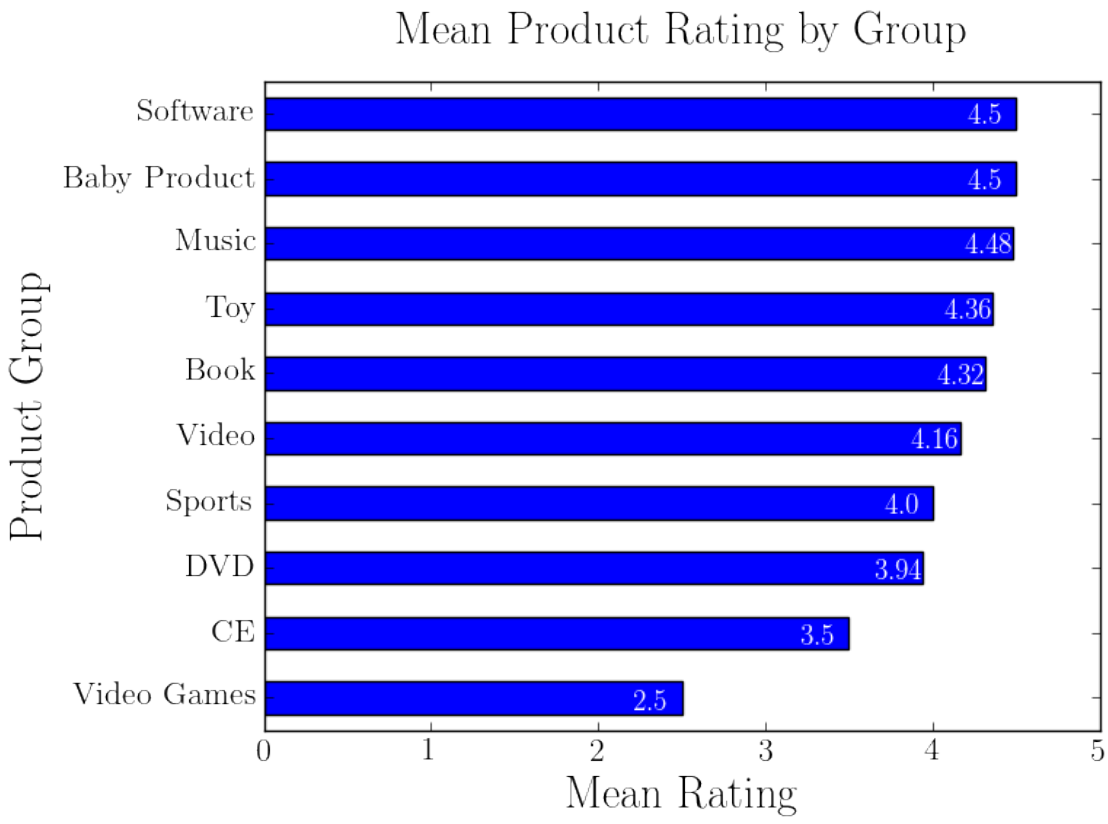

```
In [77]: file = 'amazon_data_full.csv'
         df = pd.read_csv(file);
         df = df.ix[df['number of reviews'] > 0]
         #df = df[df['salesrank']>0]
         df.head()
```

Out[77]:

	Id	ASIN	group	salesrank	number of reviews	average rating
2	1.0	0827229534	Book	396585.0	2.0	5.0
3	2.0	0738700797	Book	168596.0	12.0	4.5
4	3.0	0486287785	Book	1270652.0	1.0	5.0
5	4.0	0842328327	Book	631289.0	1.0	4.0
7	6.0	0486220125	Book	188784.0	17.0	4.0

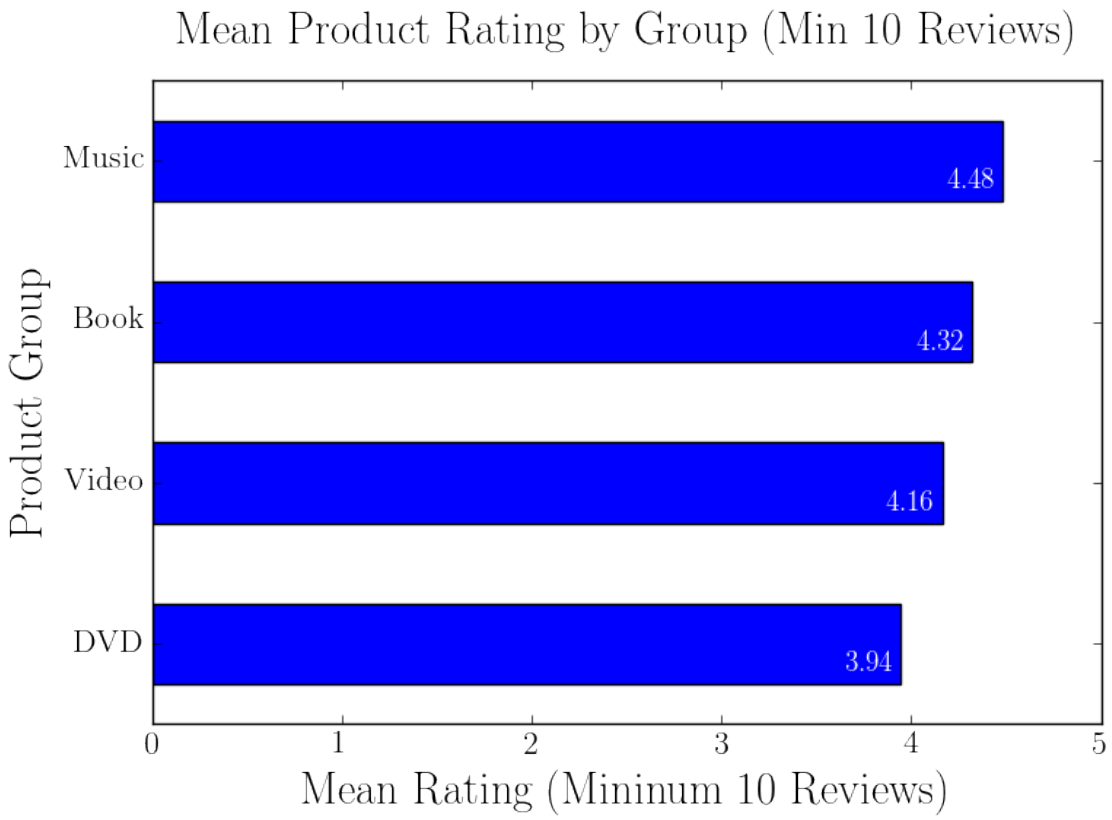
```
In [185]: categories = df.groupby('group')
          avgs = categories["average rating"].agg(np.mean)
          #avgs.sort_index().plot(kind='barh')
          ax = avgs.sort_values(ascending=1).plot(kind = 'barh',figsize=[8,6])
          plt.xlabel('Mean Rating',fontsize=22)
          plt.ylabel('Product Group',fontsize=22)
          plt.title('Mean Product Rating by Group',fontsize=22,y=1.04)
          plt.xlim([0, 5.0])
```

```
y = np.array(avgs.sort_values(ascending=1))
y = np.around(y, decimals=2)
ind = np.arange(len(y))
for i, v in enumerate(y):
    ax.text(v-0.29, i-0.18 , str(v), color='white',fontsize=14)
plt.tight_layout()
plt.savefig("Fig8.pdf",format="pdf")
plt.show()
```




```
In [216]: grouped = df.groupby(['group'])
          A = grouped.agg(np.mean)
          A = A.ix[A['number of reviews'] > 10]
          ax = A['average rating'].sort_values(ascending=1).plot(kind = 'barh',figs
          plt.xlabel('Mean Rating (Mininum 10 Reviews)',fontsize=22)
          plt.ylabel('Product Group',fontsize=22)
          plt.title('Mean Product Rating by Group (Min 10 Reviews)',fontsize=22,y=1
          plt.xlim([0, 5.0])
          y = np.array(A['average rating'].sort_values(ascending=1))
          y = np.around(y, decimals=2)
          ind = np.arange(len(y))
          for i, v in enumerate(y):
```

```
        ax.text(v-0.29, i-0.18 , str(v), color='white',fontsize=14)
    plt.tight_layout()
    plt.savefig("Fig9.pdf",format="pdf")
    plt.show()
```



In [ ]: