In [1]:

```
from os import listdir
from os.path import isfile, join
from bs4 import BeautifulSoup
import xml.etree.ElementTree as ET
import codecs
mypath ="/Anaconda/blogs"
import re
import numpy as np
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.cross_validation import train_test_split
from time import time
import sys
import scipy.sparse as sp
import pylab as pl
import cPickle
import sqlite3
import pandas as pd
import matplotlib as plt
%matplotlib inline
```

In [2]:

```
from sklearn.ensemble import RandomForestClassifier
from sklearn.feature_extraction.text import TfidfVectorizer
```

In [3]:

```
#combining Products separated in Database by type
#Operations on data performed using Pandas
#Sqlite was used as Base database during Scrapping.

def getData(name,ptype):
    print name+" Database for Reviews and Products"
    # Read sqlite query results into a pandas DataFrame
    con = sqlite3.connect("Scrape-Amazon\\amazon\\"+name+".db")
    Product_df = pd.read_sql_query("SELECT * from Amazon", con)
    Product_Reviews_df = pd.read_sql_query("SELECT * from Review",con)
    # verify that result of SQL query is stored in the dataframe
    print name+" Data\n",Product_df.head()
    print name+" Reviews\n",Product_Reviews_df.head()

    print "\n Joining Product with Reviews.."
    product = pd.merge(Product_df,Product_Reviews_df,on="pid",how="inner")
    number = product.shape[0]
    ptypeList =[ptype for i in range(0,number)]
    product['Type'] = ptypeList
    con.close()
    return product

listOfProducts = ['Booknew','Comp','Desktop']
names = ['book','electronic','desktop']
prod_df = []
for p in range(0,len(listOfProducts)):
    prod_df.append( getData(listOfProducts[p],names[p]))

prods = pd.concat(prod_df)
print prods.head()
print "Droping id_x and id_y cols ..."

prods.drop(['id_x','id_y','path'],axis=1,inplace=True)
```

```
   id             rid          rname         pid  \
0   1   RRO7VX5LEJX4C    S. R. Bryan  B00FJF4T76
1   2  R2896J1B8YFIK1    Protosapien  B00FJF4T76
2   3  R3D4SJJ4PA4U9X     count_zero  B00FJF4T76
3   4  R1Q2Q7KU1T9DMA            MLP  B00FJF4T76
4   5   RMGB8VZMA5HP9  colloquialism  B00FJF4T76

                                              review
0  Granted I just bought this so time will tell i...
1  This is the second (and last) time I'm returni...
2  I love this box-- couple little things. Came w...
3  I just received a ThinkServer TS140 modified b...
4  I am a software engineer with some extra cash ...

 Joining Product with Reviews..
   id_x         pid                                               nam
e  \
0     1  B00OAMFOF0  Rechargeable Reading Lamp for Bed & Music Sta

n...
1     1  B00OAMFOF0  Rechargeable Reading Lamp for Bed & Music Sta
```

In [ ]:

```

```

In [4]:

```
prods.columns = ['Product ID', 'Product Name','Price(Dollar)','Reviewer ID','Reviewer
```

In [5]:

```
nframe = prods.copy()
nframe[nframe['Price(Dollar)']=='Free']='$0'
nframe['Price(Dollar)'] = nframe['Price(Dollar)'].apply(lambda v:float(v.replace('$',

print "Saving Filtered and Combined Data to Csv..."
nframe.to_csv('Filtered_Data.csv',sep=',',encoding='utf-8')
```

```
Saving Filtered and Combined Data to Csv...
```

Data Analysis

1. Age Prediction

2. Gender Prediction

3. Other Analysis

In [6]:

```
print "Loading Naive Bayes Trained Model for Age Prediction(Sentiment Analysis)"
with open('MultiNB.pkl', 'rb') as fid:
    NB_loaded = cPickle.load(fid)
```

```
Loading Naive Bayes Trained Model for Age Prediction(Sentiment Analysi
s)
```

In [7]:

```
print NB_loaded
```

```
MultinomialNB(alpha=0.01, class_prior=None, fit_prior=True)
```

In [8]:

```
reviews = nframe['Review'].tolist()
```

In [9]:

```
with open('TFIDF_Vectorizer.pkl', 'rb') as fid:
    Vect_loaded = cPickle.load(fid)
```

In [10]:

```
Review_Vectorized = Vect_loaded.transform(reviews)
```

In [11]:

```
print Review_Vectorized.shape
```

```
(6320, 586663)
```

In [12]:

```

print("Predicting the outcomes of the testing set")
t0 = time()
pred = NB_loaded.predict(Review_Vectorized)
print("done in %fs" % (time() - t0))
print pred
```

```
Predicting the outcomes of the testing set
done in 0.015000s
[2 2 2 ..., 2 2 2]
```

In [13]:

```
print "Number of Reviewrs in Age group: 13-17",np.sum(np.array(pred)==1)
print "Number of Reviewrs in Age group: 17-33",np.sum(np.array(pred)==2)
print "Number of Reviewrs in Age group: 33 - ",np.sum(np.array(pred)==3)
pred = np.array(pred)
AgeFrame = pd.DataFrame(data=pred,columns=['Age'])
ages = []
for a in AgeFrame['Age']:
    if a == 1:
        ages.append('13-17')
    elif a==2:
        ages.append('17-33')
    else:
        ages.append('33-90')
AgeFrame['Ages']=ages
AgeFrame.head()
```

```
Number of Reviewrs in Age group: 13-17 139
Number of Reviewrs in Age group: 17-33 5742
Number of Reviewrs in Age group: 33 -  439
```

Out[13]:

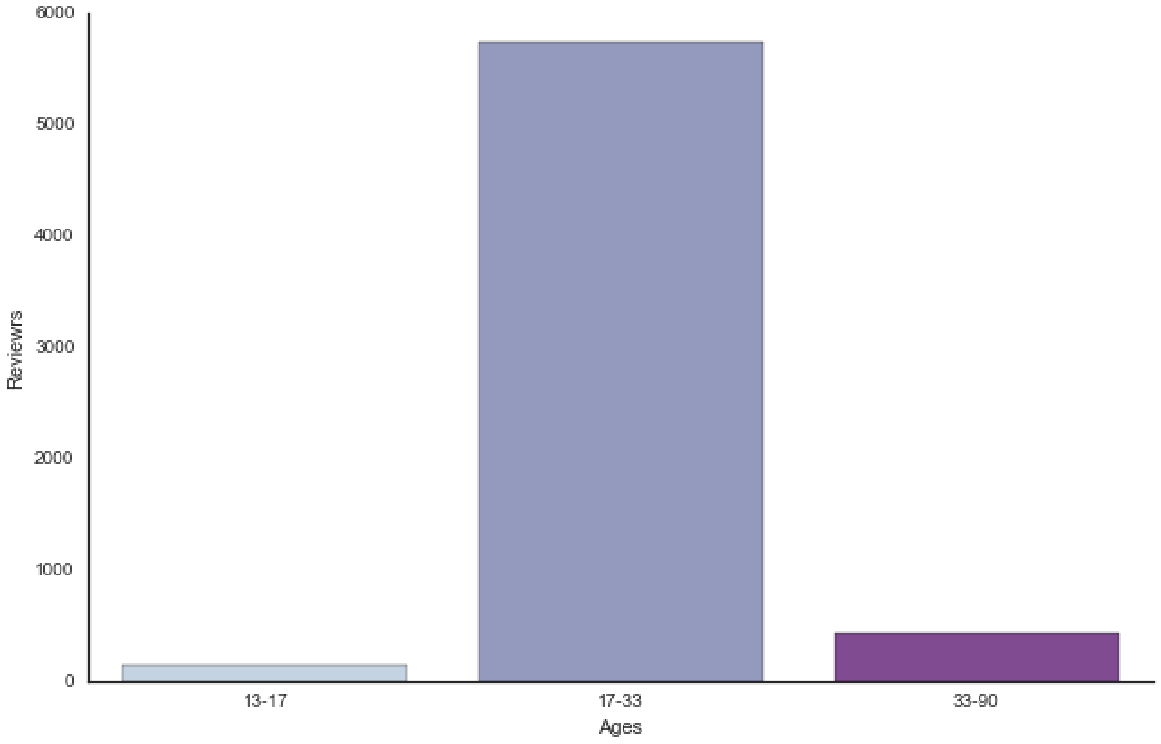
	Age	Ages
0	2	17-33
1	2	17-33
2	2	17-33
3	2	17-33
4	2	17-33

In [14]:

```
import seaborn as sns
sns.set(style="white")
```

In [15]:

```
years = ["13-17","17-33","33-90"]
g = sns.factorplot(x="Ages", data=AgeFrame, kind="count",
                   palette="BuPu", size=6, aspect=1.5, order=years)
g.set_xticklabels(step=1)
g.set_ylabels("Reviewrs")
g.savefig('Reviewrs_Age')
```



In [ ]:

```

```

In [16]:

```
print "Loading Naive Bayes trained model for Gender Classification"
with open('MultinomialNB.pkl', 'rb') as fid:
    NB_loaded = cPickle.load(fid)
```

```
Loading Naive Bayes trained model for Gender Classification
```

In [17]:

```
with open('TFIDF_Age_Vectorizer.pkl', 'rb') as fid:
    Vect_loaded = cPickle.load(fid)
```

In [18]:

```
Review_Vectorized = Vect_loaded.transform(reviews)
```

In [19]:

```
print("Predicting the outcomes of the testing set")
t0 = time()
Gender = NB_loaded.predict(Review_Vectorized)
print("done in %fs" % (time() - t0))
print Gender
```

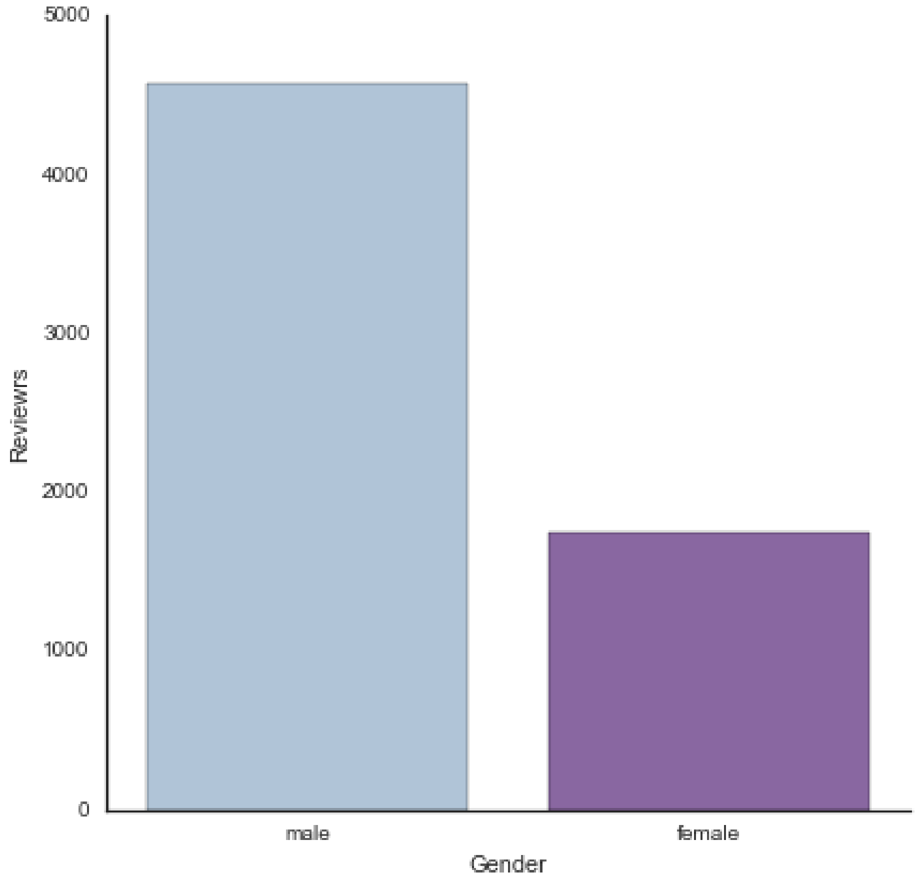
```
Predicting the outcomes of the testing set
done in 0.012000s
['female' 'male' 'female' ..., 'male' 'male' 'male']
```

In [20]:

```
GenderFrame = pd.DataFrame(data=Gender,columns=['Gender'])
```

In [21]:

```
years = ['male','female']
g = sns.factorplot(x="Gender", data=GenderFrame, kind="count",
                   palette="BuPu", size=6, aspect=1, order=years)
g.set_xticklabels(step=1)
g.set_ylabels("Reviewrs")
g.savefig('Reviewrs_Gender')
```

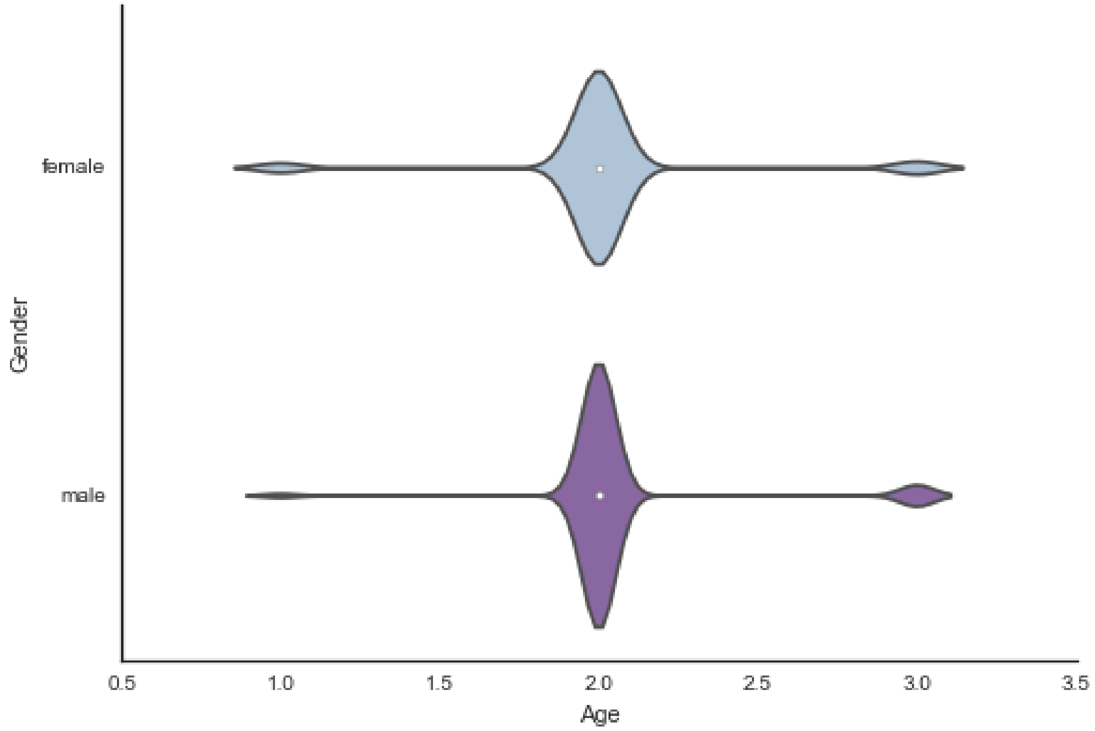


In [22]:

```
Combined_dataFrame = pd.DataFrame(data=AgeFrame.join(GenderFrame))
```

In [23]:

```
sns.violinplot(Combined_dataFrame['Age'], Combined_dataFrame['Gender'],palette="BuPu"
sns.despine()
```

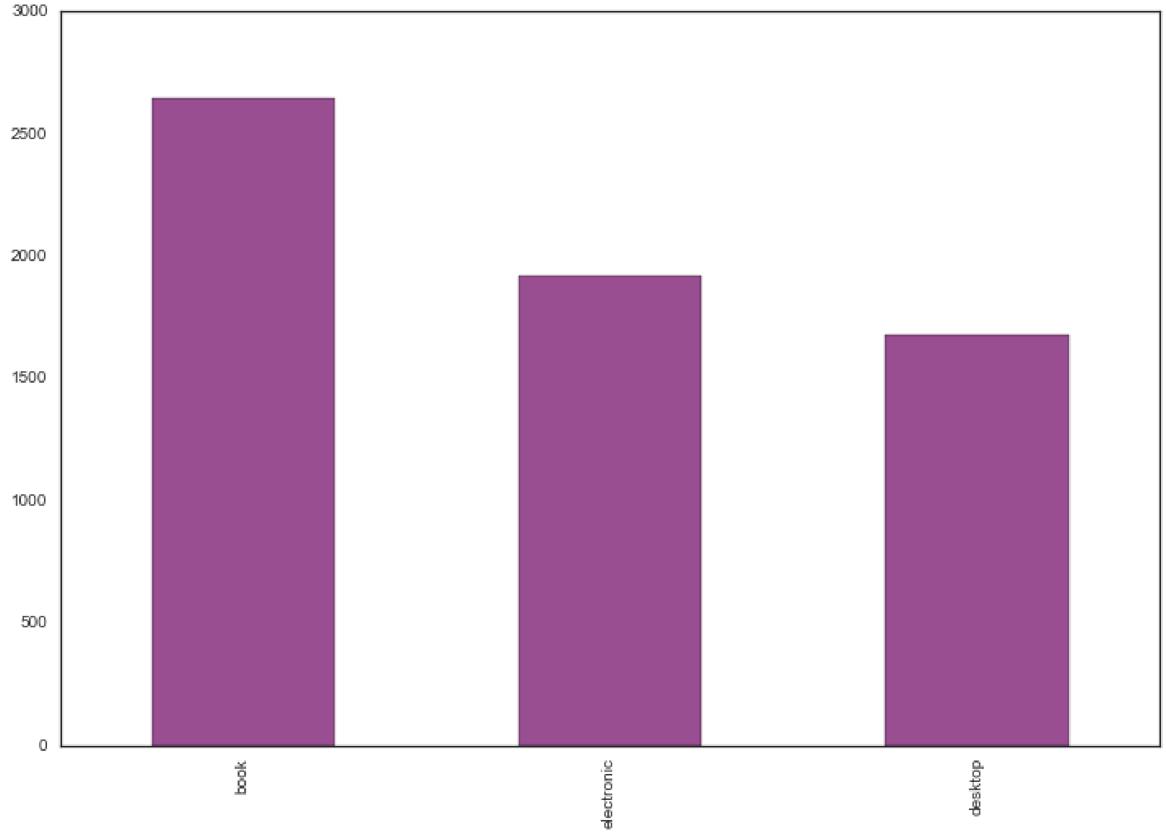


In [24]:

```
nframe['Gender'] = GenderFrame['Gender']
nframe['Age Group'] = AgeFrame['Ages']
```

In [25]:

```
plot = nframe['Product Type'].where(nframe['Product Type']!='$0').value_counts().plot
```



In [29]:

```
nframe.to_csv("Data.csv",encoding="utf-8")
```