This is the First part of my journey to become a data scientist to achieve that let's start exploring data set of good reads books dataset and this is obtained from kaggle link https://www.kaggle.com/jealousleopard/goodreadsbooks/downloads/goodreadsbooks.zip/6 (https://www.kaggle.com/jealousleopard/goodreadsbooks/downloads/goodreadsbooks.zip/6)

In [0]:

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
import warnings
warnings.filterwarnings("ignore")
```

In [9]:

```
data = pd.read_csv("/content/drive/My Drive/Data_Scientist/EDA/books.csv",error_bad_lines=F
data.head()
```

```
b'Skipping line 4012: expected 10 fields, saw 11\nSkipping line 5688: expected 10 fields,
saw 11\nSkipping line 7056: expected 10 fields, saw 11\nSkipping line 10601: expected 10 f
ields, saw 11\nSkipping line 10668: expected 10 fields, saw 11\n'
```

Out[9]:

	bookID	title	authors	average_rating	isbn	isbn13	language_code	# num_pages	ratings_count	te
0	1	Harry Potter and the Half-Blood Prince (Harry ...	J.K. Rowling-Mary GrandPré	4.56	0439785960	9780439785969	eng	652	1944099	
1	2	Harry Potter and the Order of the Phoenix (Har...	J.K. Rowling-Mary GrandPré	4.49	0439358078	9780439358071	eng	870	1996446	
2	3	Harry Potter and the Sorcerer's Stone (Harry P...	J.K. Rowling-Mary GrandPré	4.47	0439554934	9780439554930	eng	320	5629932	
3	4	Harry Potter and the Chamber of Secrets (Harry...	J.K. Rowling	4.41	0439554896	9780439554893	eng	352	6267	
4	5	Harry Potter and the Prisoner of Azkaban (Harr...	J.K. Rowling-Mary GrandPré	4.55	043965548X	9780439655484	eng	435	2149872	

In [11]:

```
print(data.shape)
```

```
(13714, 10)
```

It is a dataset containing 13714 records with 10 features

In [26]:

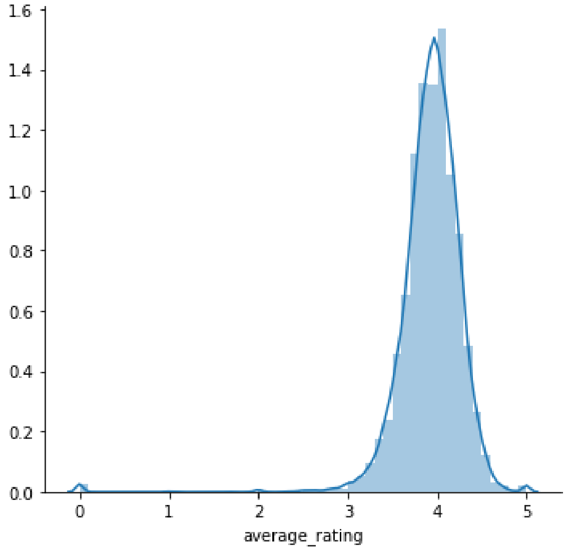
```
data.describe()
```

Out[26]:

	bookID	average_rating	isbn13	# num_pages	ratings_count	text_reviews_count
count	13714.000000	13714.000000	1.371400e+04	13714.000000	1.371400e+04	13714.000000
mean	22159.859195	3.930620	9.764017e+12	342.402727	1.776540e+04	533.632128
std	13700.926816	0.357893	3.987679e+11	252.650165	1.129572e+05	2529.006691
min	1.000000	0.000000	8.987060e+09	0.000000	0.000000e+00	0.000000
25%	10619.250000	3.770000	9.780345e+12	196.000000	8.300000e+01	7.000000
50%	21321.500000	3.960000	9.780613e+12	301.000000	6.305000e+02	40.000000
75%	33311.750000	4.130000	9.780940e+12	421.000000	4.742250e+03	222.000000
max	47709.000000	5.000000	9.790008e+12	6576.000000	5.629932e+06	93619.000000

In [16]:

```
sns.FacetGrid(data,size=5)\
.map(sns.distplot,"average_rating")\
.add_legend();
plt.show();
```



The most of the average rating presents between 3 - 5

In [20]:

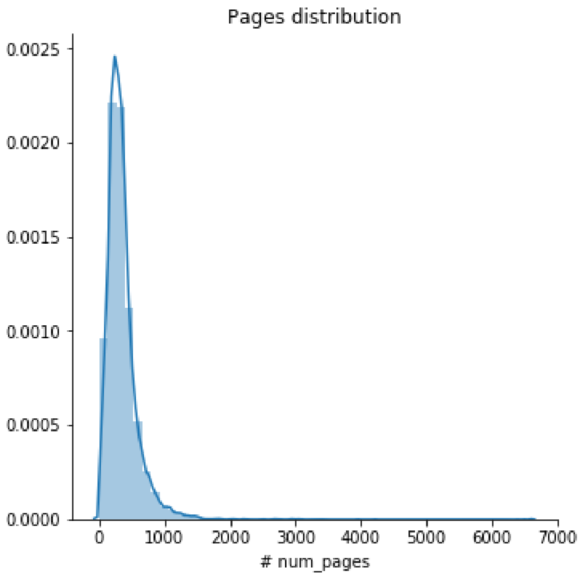
```
data.columns
```

Out[20]:

```
Index(['bookID', 'title', 'authors', 'average_rating', 'isbn', 'isbn13',
       'language_code', '# num_pages', 'ratings_count', 'text_reviews_count'],
      dtype='object')
```

In [24]:

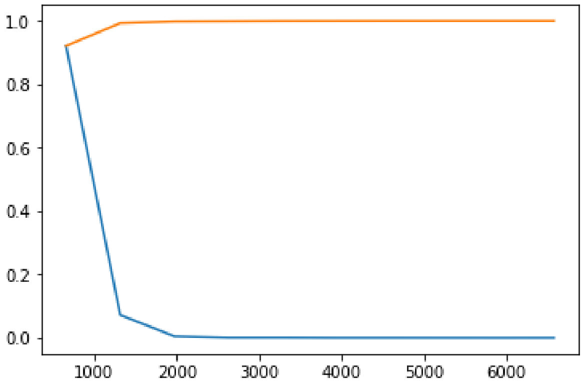
```
sns.FacetGrid(data,size=5)\
.map(sns.distplot,"# num_pages")\
.add_legend();
plt.title("Pages distribution");
plt.show();
```



In [87]:

```
counts,bin_edges =  np.histogram(data['# num_pages'],bins=10,density=True)
pdf = counts/(sum(counts))
cdf = np.cumsum(pdf)
plt.plot(bin_edges[1:],pdf)
plt.plot(bin_edges[1:],cdf)
plt.show();
```

```
[9.21175441e-01 7.18973312e-02 5.10427301e-03 6.56263672e-04
 7.29181858e-04 1.45836372e-04 1.45836372e-04 7.29181858e-05
 0.00000000e+00 7.29181858e-05]
[   0.    657.6 1315.2 1972.8 2630.4 3288.  3945.6 4603.2 5260.8 5918.4
 6576. ]
```



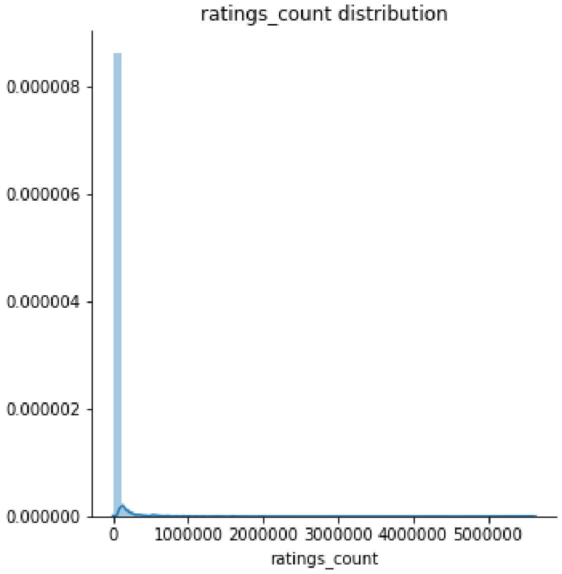
In [91]:

```
num_pages_list = list(data['# num_pages'])
num_pages_list.sort()
print("99 th percentile value is",np.percentile(data['# num_pages'],99))
```

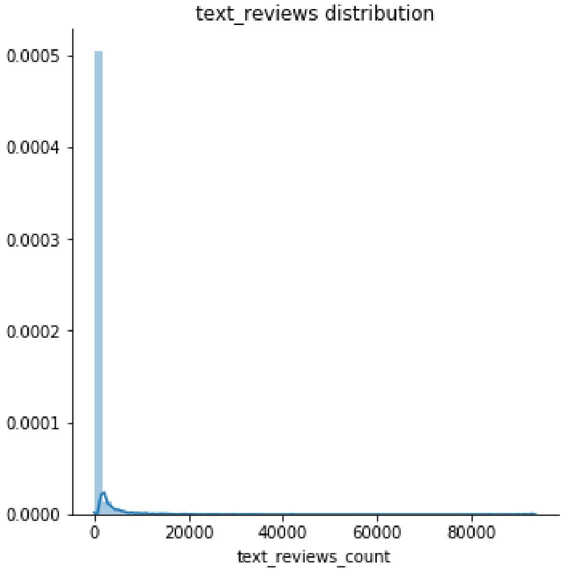
```
99 th percentile value is 1200.0
```

1% of the books are more than 1200 pages

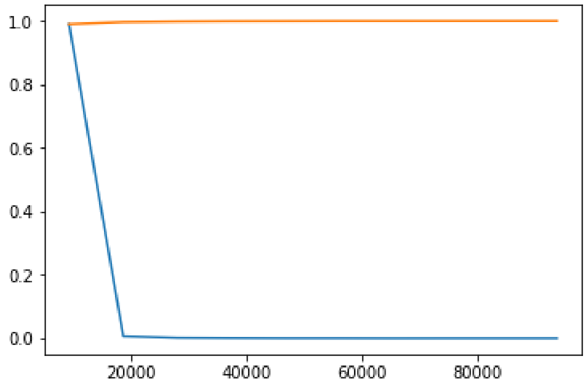
In [31]:
```
sns.FacetGrid(data,size=5)\
.map(sns.distplot,"ratings_count")\
.add_legend();
plt.title("ratings_count distribution");
plt.show();
```



In [29]:
```
sns.FacetGrid(data,size=5)\
.map(sns.distplot,"text_reviews_count")\
.add_legend();
plt.title("text_reviews distribution");
plt.show();
```



In [92]:
```
counts,bin_edges =  np.histogram(data['text_reviews_count'],bins=10,density=True)
pdf = counts/(sum(counts))
cdf = np.cumsum(pdf)
plt.plot(bin_edges[1:],pdf)
plt.plot(bin_edges[1:],cdf)
plt.show();
```



In [97]:
```
num_pages_list = list(data['text_reviews_count'])
num_pages_list.sort()
print("99.5 th percentile value is",np.percentile(data['text_reviews_count'],99.5))
```

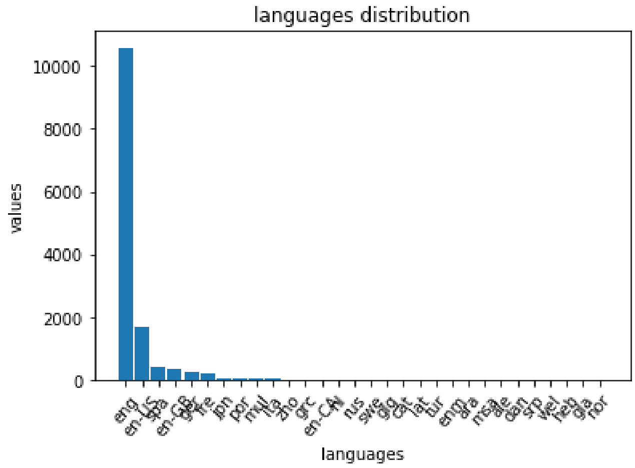
```
99.5 th percentile value is 14443.609999999997
```

0.5 percentile of the text_reviews_count is greater than 15000

In [42]:
```
lang_list = data['language_code'].value_counts()
lang_list_index = list(lang_list.index)
lang_lis_values = []
for i in lang_list :
  lang_lis_values.append(i)
print(lang_list_index)
print(lang_lis_values)
```

```
['eng', 'en-US', 'spa', 'en-GB', 'ger', 'fre', 'jpn', 'por', 'mul', 'ita', 'zho', 'grc',
'en-CA', 'nl', 'rus', 'swe', 'glg', 'cat', 'lat', 'tur', 'enm', 'ara', 'msa', 'ale', 'da
n', 'srp', 'wel', 'heb', 'gla', 'nor']
[10594, 1699, 419, 341, 238, 209, 64, 27, 21, 19, 16, 12, 9, 7, 7, 6, 4, 3, 3, 3, 3, 2, 1,
1, 1, 1, 1, 1, 1, 1]
```

In [65]:
```
plt.bar(lang_list_index,lang_lis_values,width=0.9)
plt.xlabel('values', fontsize=10)
plt.ylabel('languages', fontsize=10)
plt.xticks(lang_list_index, fontsize=10, rotation=50)
plt.title("languages distribution");
plt.show();
```



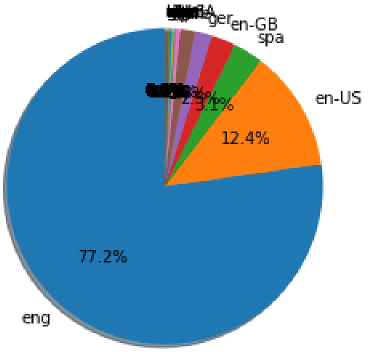
In [86]:

```
# pie plot : https://pythonspot.com/matplotlib-pie-chart/

import matplotlib.pyplot as plt

# Plot
plt.pie(lang_lis_values, labels=lang_list_index,
autopct='%0.1f%%', shadow=True, startangle=90)

plt.axis('equal')
plt.show()
```



77.2% of the books are english language based

In [0]:

```
authors_list = data['authors'].value_counts()
authors_list = authors_list[:10]
authors_list_index = list(authors_list.index)
authors_lis_values = []
for i in authors_list :
  authors_lis_values.append(i)
```

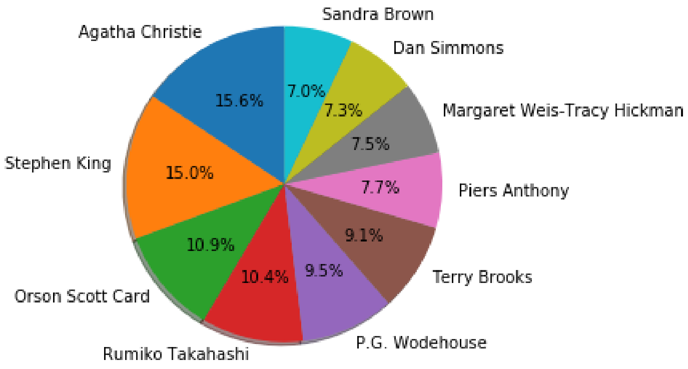
In [107]:

```
# pie plot : https://pythonspot.com/matplotlib-pie-chart/

import matplotlib.pyplot as plt

# Plot
plt.pie(authors_lis_values, labels=authors_list_index,
autopct='%0.1f%%', shadow=True, startangle=90)

plt.axis('equal')
plt.show()
```



The above picture gives us the top 10 authors of the given data set

In [115]:

```
!pip install tqdm
```

```
Requirement already satisfied: tqdm in /usr/local/lib/python3.6/dist-packages (4.28.1)
```

In [0]:

```
from tqdm import tqdm
```

In [0]:

```
# https://stackoverflow.com/a/47091490/4084039
import re

def decontracted(phrase):
    # specific
    phrase = re.sub(r"won't", "will not", phrase)
    phrase = re.sub(r"can\'t", "can not", phrase)

    # general
    phrase = re.sub(r"n\'t", " not", phrase)
    phrase = re.sub(r"\'re", " are", phrase)
    phrase = re.sub(r"\'s", " is", phrase)
    phrase = re.sub(r"\'d", " would", phrase)
    phrase = re.sub(r"\'ll", " will", phrase)
    phrase = re.sub(r"\'t", " not", phrase)
    phrase = re.sub(r"\'ve", " have", phrase)
    phrase = re.sub(r"\'m", " am", phrase)
    return phrase
```

In [122]:

```
preprocessed_text_values = []

for sentence in tqdm(data['title'].values) :
  term = decontracted(sentence)
  term = term.replace(")","")
  term = term.replace("(","")
  term = term.replace("&","_")
  term = term.replace("#","")
  preprocessed_text_values.append(term.lower().strip())
```

```
100%|██████████| 13714/13714 [00:00<00:00, 73761.77it/s]
```

In [0]:

```
from collections import Counter
my_counter = Counter()
for word in preprocessed_text_values:
    my_counter.update(word.split())
```

In [0]:

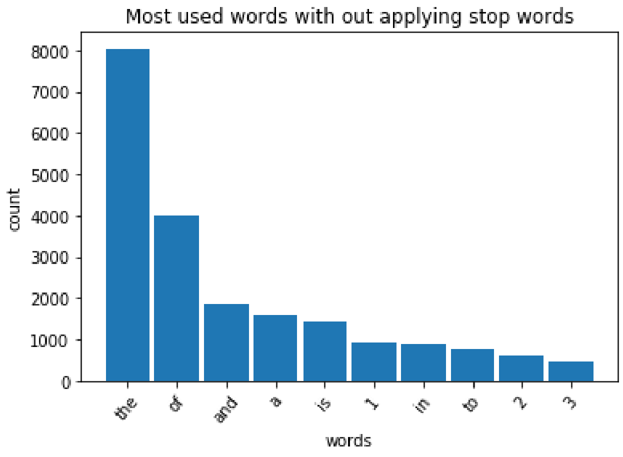
```
sorted_my_counter = sorted(my_counter.items(), key=lambda kv: kv[1],reverse=True)
```

In [0]:

```
for i in sorted_my_counter[0:10] :
  words.append(i[0])
  word_count.append(i[1])
```

In [149]:

```
plt.bar(words[0:10],word_count[0:10],width=0.9)
plt.xlabel('words', fontsize=10)
plt.ylabel('count', fontsize=10)
plt.xticks(words[0:10], fontsize=10, rotation=50)
plt.title("Most used words with out applying stop words");
plt.show();
```



In [0]:

```
# https://gist.github.com/sebleier/554280
# we are removing the words from the stop words list: 'no', 'nor', 'not'
stopwords= ['i', 'me', 'my', 'myself', 'we', 'our', 'ours', 'ourselves', 'you', "you're", "
            "you'll", "you'd", 'your', 'yours', 'yourself', 'yourselves', 'he', 'him', 'his
            'she', "she's", 'her', 'hers', 'herself', 'it', "it's", 'its', 'itself', 'they'
            'theirs', 'themselves', 'what', 'which', 'who', 'whom', 'this', 'that', "that'l
            'am', 'is', 'are', 'was', 'were', 'be', 'been', 'being', 'have', 'has', 'had',
            'did', 'doing', 'a', 'an', 'the', 'and', 'but', 'if', 'or', 'because', 'as', 'u
            'at', 'by', 'for', 'with', 'about', 'against', 'between', 'into', 'through', 'd
            'above', 'below', 'to', 'from', 'up', 'down', 'in', 'out', 'on', 'off', 'over',
            'then', 'once', 'here', 'there', 'when', 'where', 'why', 'how', 'all', 'any', '
            'most', 'other', 'some', 'such', 'only', 'own', 'same', 'so', 'than', 'too', 'v
            's', 't', 'can', 'will', 'just', 'don', "don't", 'should', "should've", 'now',
            've', 'y', 'ain', 'aren', "aren't", 'couldn', "couldn't", 'didn', "didn't", 'do
            "hadn't", 'hasn', "hasn't", 'haven', "haven't", 'isn', "isn't", 'ma', 'mightn',
            "mustn't", 'needn', "needn't", 'shan', "shan't", 'shouldn', "shouldn't", 'wasn'
            'won', "won't", 'wouldn', "wouldn't"]
```

In [154]:

```
print(sorted_my_counter)
```

```
[('a', 1578), ('1', 917), ('2', 615), ('3', 444), ('/', 306), ('_', 290), ('stories', 28
7), ('life', 269), ('4', 248), ('de', 247), ('world', 231), ('vol.', 229), ('guide', 22
3), ('history', 205), ('la', 197), ('book', 189), ('volume', 189), ('love', 176), ('ne
w', 170), ('5', 167), ('tales', 167), ('story', 165), ('complete', 161), ('time', 160),
('man', 153), ('war', 150), ('6', 147), ('american', 136), ('one', 131), ('el', 129),
('house', 125), ('trilogy', 123), ('death', 116), ('great', 115), ('black', 113), ('litt
le', 113), ('night', 111), ('star', 111), ('7', 109), ('america', 105), ('dark', 103),
('lost', 102), ('last', 102), ('lord', 98), ('harry', 93), ('not', 93), ('art', 93), ('t
hree', 93), ('short', 88), ('chronicles', 88), ('women', 88), ('king', 88), ('8', 82),
('no', 78), ('poems', 78), ('girl', 77), ('die', 75), ('magic', 75), ('vampire', 74),
('children', 73), ('like', 73), ('adventures', 72), ('first', 72), ('secret', 72), ('mys
tery', 72), ('family', 71), ('best', 70), ('essays', 70), ('writings', 69), ('god', 69),
('philosophy', 68), ('murder', 68), ('potter', 67), ('saga', 65), ('city', 64), ('whit
e', 64), ('der', 64), ('collected', 63), ('tale', 63), ('1:', 63), ('science', 62), ('se
lected', 62), ('woman', 61), ('five', 60), ('rings', 60), ('true', 60), ('1-3', 59), ('m
odern', 59), ('10', 59), ('people', 59), ('novels', 58), ('journey', 58), ('two', 58),
('jack', 58), ('john', 57), ('dead', 56), ('9', 56), ('sea', 55), ('shadow', 55), ('hear
t', 55), ('good', 54), ('long', 54), ('red', 54), ('years', 53), ('-', 53), ('big', 53),
('power', 53), ('books', 52), ('moon', 52), ('way', 51), ('letters', 51), ('fire', 51),
('high', 51), ('11', 51), ('road', 50), ('plays', 50), ('wild', 50), ('christmas', 50),
```

In [0]:

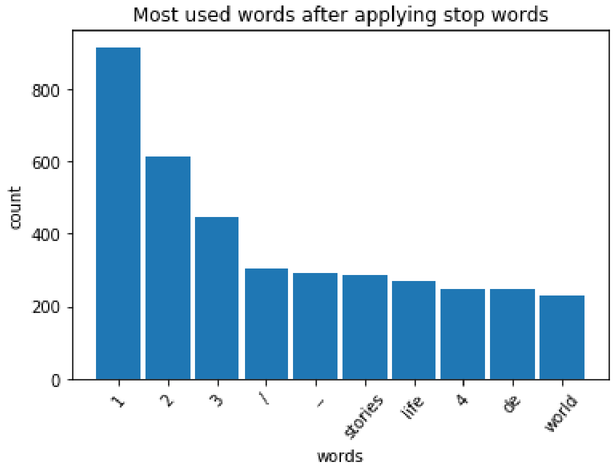
```
required_counter_list = []
for i in sorted_my_counter  :
  if i[0] not in stopwords :
    required_counter_list.append(i)
```

In [0]:

```
words = []
word_count = []
for i in required_counter_list[0:10] :
  words.append(i[0])
  word_count.append(i[1])
```

In [162]:

```
plt.bar(words[0:10],word_count[0:10],width=0.9)
plt.xlabel('words', fontsize=10)
plt.ylabel('count', fontsize=10)
plt.xticks(words[0:10], fontsize=10, rotation=50)
plt.title("Most used words after applying stop words");
plt.show();
```



Continue: ***This is the EDA part and we need to do data preprocessing and data cleaning and machine learning models a lot more to go so let's keep learning***