lec01

September 3, 2025

[1]:
```
from datascience import *
import numpy as np
%matplotlib inline
import matplotlib.pyplot as plots
plots.style.use('fivethirtyeight')
import warnings
warnings.simplefilter(action="ignore", category=FutureWarning)
```

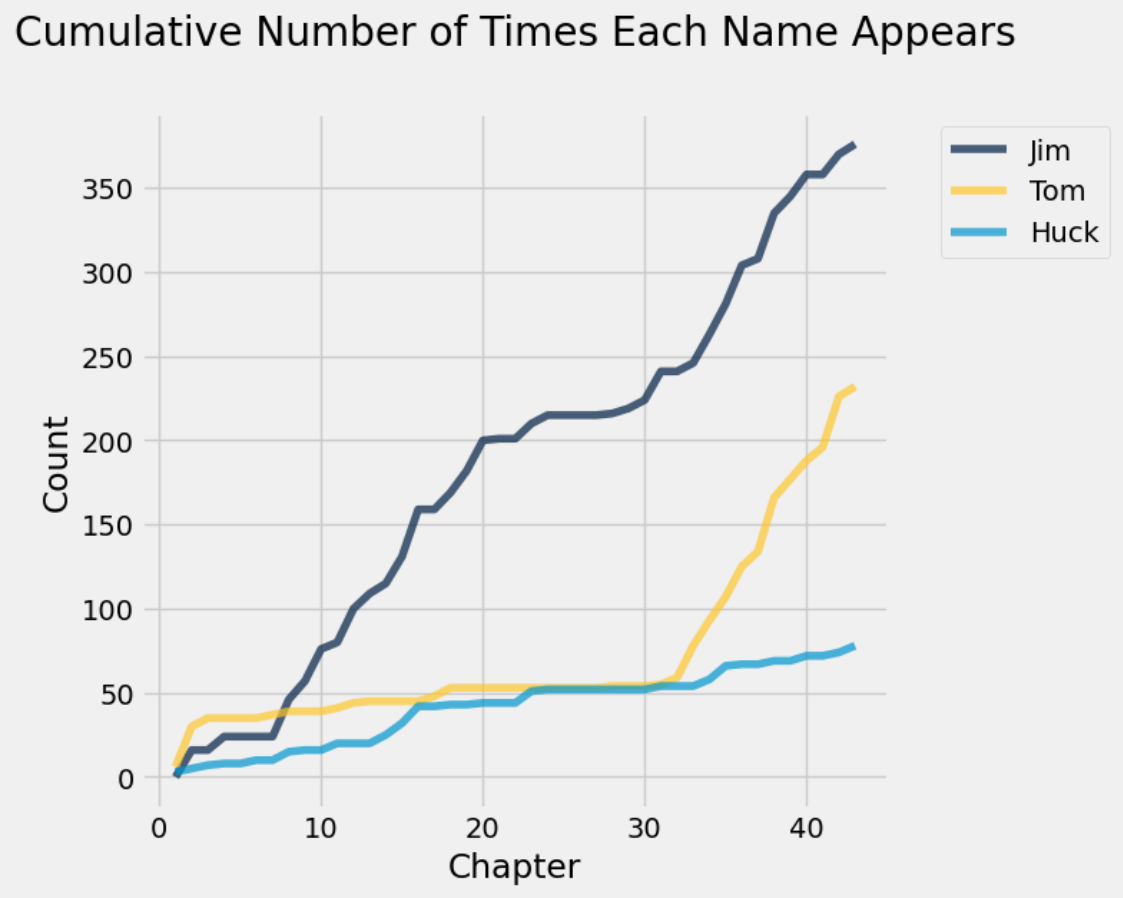
[2]:
```
with open('huck_finn.txt', 'r') as file:
    huck_finn_text = file.read()
    huck_finn_chapters = huck_finn_text.split('CHAPTER ')[44:]
```

[3]:
```
# Create a new datascience Table
Table().with_column('Chapters', huck_finn_chapters)
```

[3]:
```
Chapters
I.

YOU don't know about me without you have read a book …
II.

WE went tiptoeing along a path amongst the trees ba …
III.

WELL, I got a good going-over in the morning from  …
IV.

WELL, three or four months run along, and it was we …
V.

I had shut the door to.  Then I turned around and th …
VI.

WELL, pretty soon the old man was up and around aga …
VII.

"GIT up!  What you 'bout?"
```

```
I opened my eyes and l …
VIII.

THE sun was up so high when I waked that I judged …
IX.

I wanted to go and look at a place right about the  …
X.

AFTER breakfast I wanted to talk about the dead man  …
… (33 rows omitted)
```

[4]:
```
# Get the cumulative counts the names Jim, Tom, and Huck appear in each chapter.

counts = Table().with_columns([
        'Jim', np.cumsum(np.char.count(huck_finn_chapters, 'Jim')),
        'Tom', np.cumsum(np.char.count(huck_finn_chapters, 'Tom')),
        'Huck', np.cumsum(np.char.count(huck_finn_chapters, 'Huck'))
    ])

# Plot the cumulative counts:
# how many times in Chapter 1, how many times in Chapters 1 and 2, and so on.

cum_counts = counts.with_column('Chapter', np.arange(1, 44, 1))
cum_counts.plot(column_for_xticks=3)

plots.title('Cumulative Number of Times Each Name Appears', y=1.08)
plots.ylabel('Count');
```



[5]:
```
with open('little_women.txt', 'r') as file:
    little_women_text = file.read()
    little_women_chapters = little_women_text.split('CHAPTER ')[1:]
```

[ ]:
```
# little_women_chapters
```

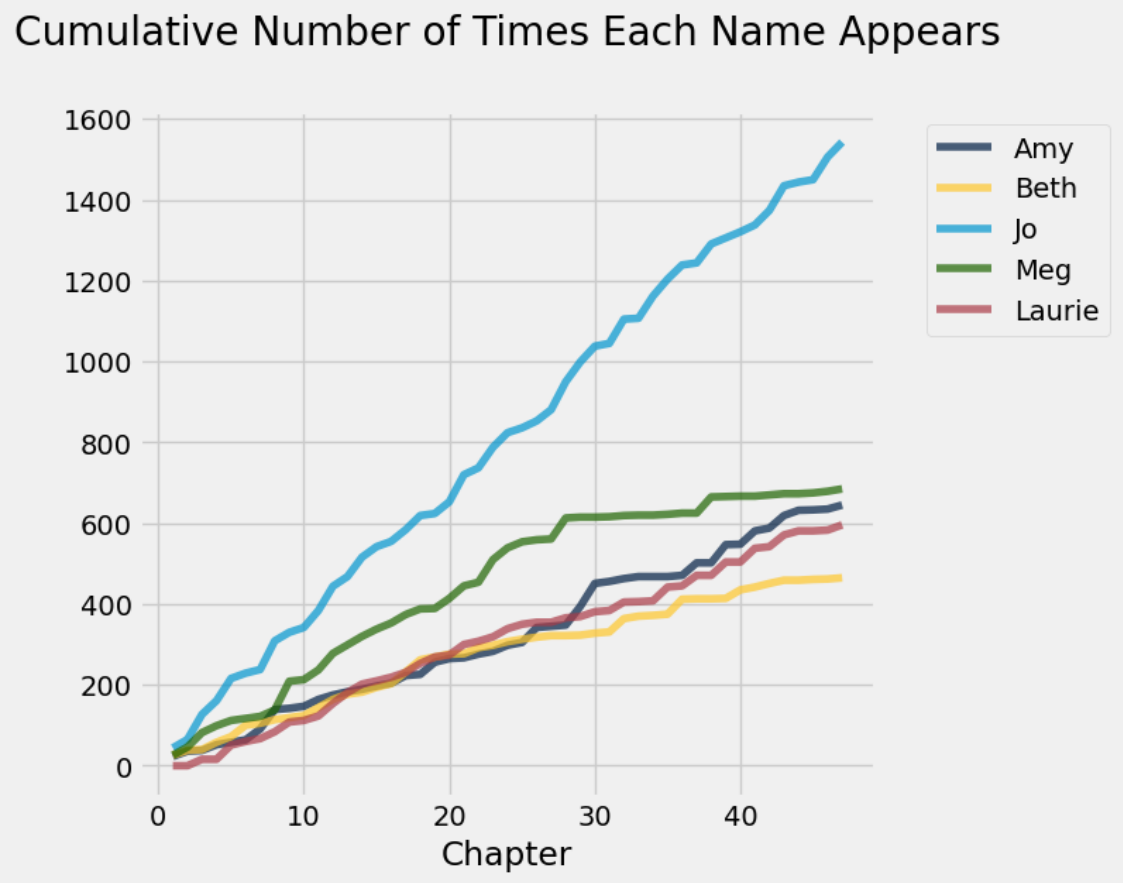
[7]:
```
Table().with_column('Chapters', little_women_chapters)
```

[7]:
```
Chapters
ONE

PLAYING PILGRIMS

"Christmas won't be Christmas wit …
TWO

A MERRY CHRISTMAS

Jo was the first to wake in the  …
```

```
THREE

THE LAURENCE BOY

"Jo!  Jo!  Where are you?" crie …
FOUR

BURDENS

"Oh, dear, how hard it does seem to take  …
FIVE

BEING NEIGHBORLY

"What in the world are you going …
SIX

BETH FINDS THE PALACE BEAUTIFUL

The big house did  …
SEVEN

AMY'S VALLEY OF HUMILIATION

"That boy is a perfe …
EIGHT

JO MEETS APOLLYON

"Girls, where are you going?"  …
NINE

MEG GOES TO VANITY FAIR

"I do think it was the mo …
TEN

THE P.C. AND P.O.

As spring came on, a new set of  …
… (37 rows omitted)
```

[8]:
```
# Get the cumulative counts of the names in the chapters of Little Women

counts = Table().with_columns([
        'Amy', np.cumsum(np.char.count(little_women_chapters, 'Amy')),
        'Beth', np.cumsum(np.char.count(little_women_chapters, 'Beth')),
```

```
        'Jo', np.cumsum(np.char.count(little_women_chapters, 'Jo')),
        'Meg', np.cumsum(np.char.count(little_women_chapters, 'Meg')),
        'Laurie', np.cumsum(np.char.count(little_women_chapters, 'Laurie'))
    ])

# Plot the cumulative counts.
counts.with_column('Chapter', np.arange(1, 48, 1)).plot(column_for_xticks=5)
plots.title('Cumulative Number of Times Each Name Appears', y=1.08);
```



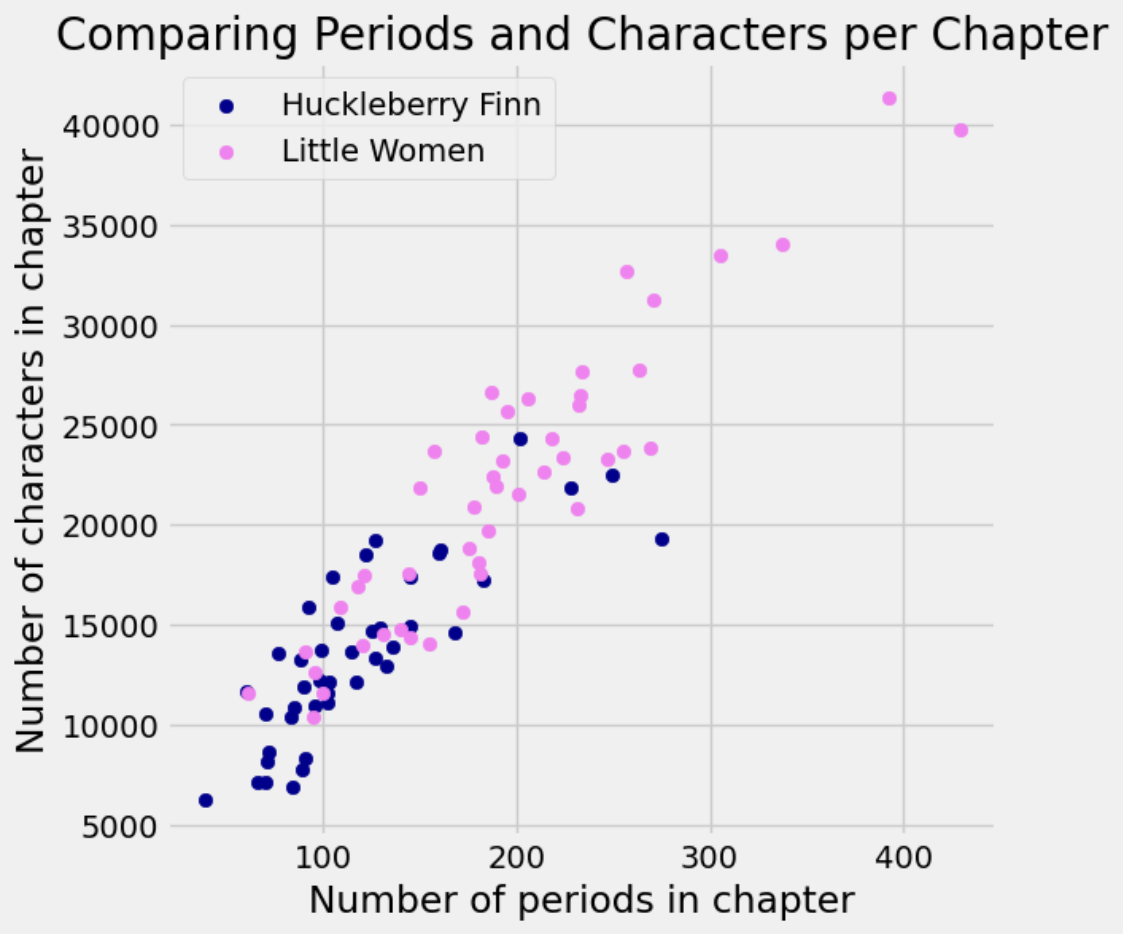
[9]:
```
# In each chapter, count the number of all characters;
# call this the "length" of the chapter.
# Also count the number of periods.

chars_periods_huck_finn = Table().with_columns([
        'Huck Finn Chapter Length', [len(s) for s in huck_finn_chapters],
        'Number of Periods', np.char.count(huck_finn_chapters, '.')
    ])

chars_periods_huck_finn
```

[9]:
```
Huck Finn Chapter Length | Number of Periods
7088                     | 66
12113                    | 117
8612                     | 72
6892                     | 84
8269                     | 91
14672                    | 125
13349                    | 127
22483                    | 249
8153                     | 71
7109                     | 70
… (33 rows omitted)
```

[10]:
```
chars_periods_little_women = Table().with_columns([
        'Little Women Chapter Length', [len(s) for s in little_women_chapters],
        'Number of Periods', np.char.count(little_women_chapters, '.')
    ])

chars_periods_little_women
```

[10]:
```
Little Women Chapter Length | Number of Periods
21952                       | 189
22384                       | 188
20815                       | 231
25689                       | 195
23657                       | 255
14736                       | 140
14549                       | 131
22679                       | 214
34054                       | 337
19657                       | 185
… (37 rows omitted)
```

[11]:
```
plots.figure(figsize=(6, 6))
plots.scatter(chars_periods_huck_finn.column(1),
              chars_periods_huck_finn.column(0),
              color='darkblue',
             label='Huckleberry Finn')
plots.scatter(chars_periods_little_women.column(1),
              chars_periods_little_women.column(0),
              color='violet',
             label='Little Women')
plots.legend()
plots.title('Comparing Periods and Characters per Chapter')
plots.xlabel('Number of periods in chapter')
plots.ylabel('Number of characters in chapter');
```


Comparing Periods and Characters per Chapter
Huckleberry Finn
Little Women
Number of characters in chapter
40000
35000
30000
25000
20000
15000
10000
5000
100
200
300
400
Number of periods in chapter