In [1]:
```
# Stuff that will appear at the top of notebooks;
# You don't have to understand how this works or change it for now.

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)

from urllib.request import urlopen
import re
def read_url(url):
    return re.sub('\\s+', ' ', urlopen(url).read().decode())
```

In [2]:
```
2+3
```

Out[2]: 5

In [3]:
```
# Read two books, fast!

#huck_finn_url = 'https://www.inferentialthinking.com/data/huck_finn.txt'
#huck_finn_text = read_url(huck_finn_url)
file = open("huck_finn.txt",mode='r')
huck_finn_text = file.read()
file.close()
huck_finn_chapters = huck_finn_text.split('CHAPTER ')[44:]

#little_women_url = 'https://www.inferentialthinking.com/data/little_women.
#little_women_text = read_url(little_women_url)
file = open("little_women.txt",mode='r')
little_women_text = file.read()
file.close()
little_women_chapters = little_women_text.split('CHAPTER ')[1:]
```

In [4]:
```
#huck_finn_chapters
```

In [5]:
```
#little_women_chapters
```

In [6]:
```
Table().with_column('Chapters', huck_finn_chapters)
```

Out[6]:

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. Â Then I turned around and t ...
VI. WELL, pretty soon the old man was up and around aga ...
VII. "GIT up! Â What you 'bout?" I opened my eyes and ...
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)

In [7]:
```
np.char.count(huck_finn_chapters, 'Tom')
```

Out[7]:
```
array([ 6, 24,  5,  0,  0,  0,  2,  2,  0,  0,  2,  3,  1,  0,  0,  0,  3,
        5,  0,  0,  0,  0,  0,  0,  0,  0,  0,  1,  0,  0,  1,  4, 19, 15,
       14, 18,  9, 32, 11, 11,  8, 30,  6])
```

In [8]:
```
np.char.count(huck_finn_chapters, 'Jim')
```

Out[8]:
```
array([ 0, 16,  0,  8,  0,  0,  0, 22, 11, 19,  4, 20,  9,  6, 16, 28,  0,
       10, 13, 18,  1,  0,  9,  5,  0,  0,  0,  1,  3,  5, 17,  0,  5, 17,
       18, 23,  4, 27, 10, 13,  0, 12,  6])
```

In [9]:
```
counts = Table().with_columns([
    'Tom', np.char.count(huck_finn_chapters, 'Tom'),
    'Jim', np.char.count(huck_finn_chapters, 'Jim'),
    'Huck', np.char.count(huck_finn_chapters, 'Huck'),
])
counts
```

Out[9]:

Tom	Jim	Huck
6	0	3
24	16	2
5	0	2
0	8	1
0	0	0
0	0	2
2	0	0
2	22	5
0	11	1
0	19	0

... (33 rows omitted)

In [10]:
```
#following code fails because cumsum is no longer function in datascience

#cum_counts = counts.cumsum().with_column('Chapter', np.arange(1, 44, 1))
#cum_counts.plot(column_for_xticks=3)
#plots.title('Cumulative Number of Times Name Appears');
```

In [11]:
```
#however, can do the following (although there are more clever ways)
```

In [12]:
```
np.cumsum(np.char.count(huck_finn_chapters, 'Tom'))
```

Out[12]:
```
array([  6,  30,  35,  35,  35,  35,  37,  39,  39,  39,  41,  44,  45,
        45,  45,  45,  48,  53,  53,  53,  53,  53,  53,  53,  53,  53,
        53,  54,  54,  54,  55,  59,  78,  93, 107, 125, 134, 166, 177,
       188, 196, 226, 232], dtype=int32)
```

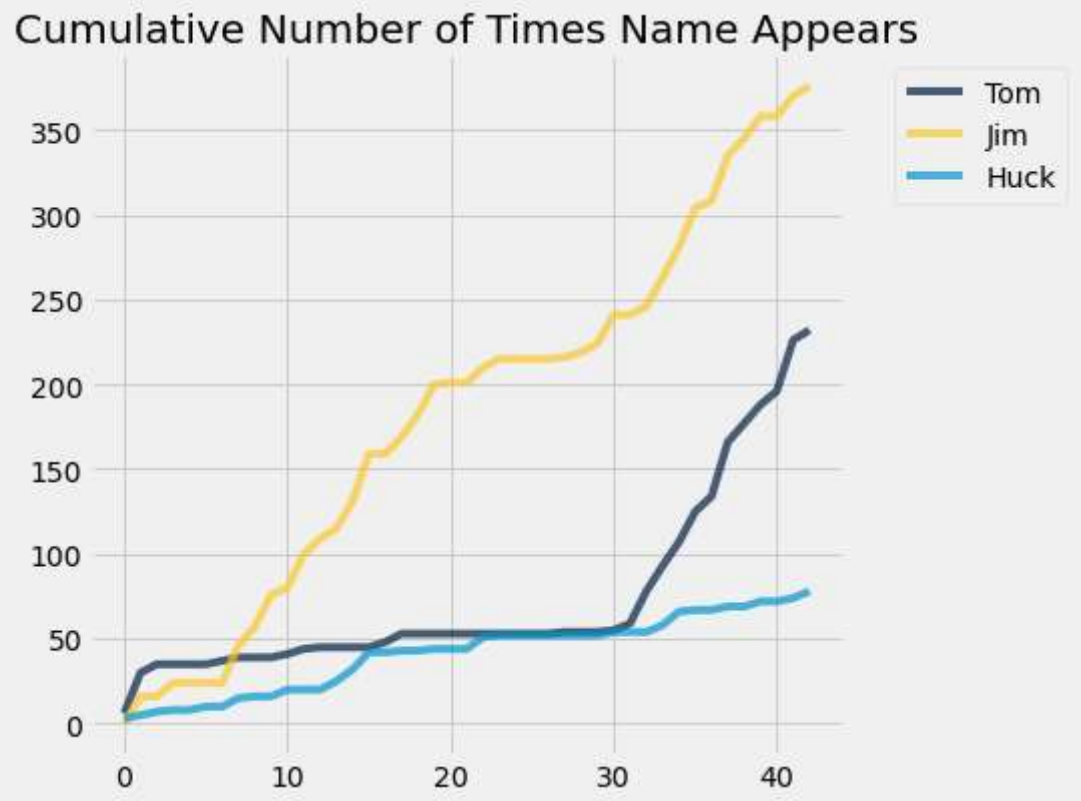
In [13]:
```
cumcounts = Table().with_columns([
    'Tom', np.cumsum(np.char.count(huck_finn_chapters, 'Tom')),
    'Jim', np.cumsum(np.char.count(huck_finn_chapters, 'Jim')),
    'Huck', np.cumsum(np.char.count(huck_finn_chapters, 'Huck')),
])
cumcounts
```

Out[13]:

Tom	Jim	Huck
6	0	3
30	16	5
35	16	7
35	24	8
35	24	8
35	24	10
37	24	10
39	46	15
39	57	16
39	76	16

... (33 rows omitted)

In [14]:
```
cumcounts.plot()
plots.title('Cumulative Number of Times Name Appears');
```



In [15]:
```
# The chapters of Little Women

Table().with_column('Chapters', little_women_chapters)
```

Out[15]:

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)

In [16]:
```
# Counts of names in the chapters of Little Women

people = ['Amy', 'Beth', 'Jo', 'Laurie', 'Meg']
people_counts = {pp: np.char.count(little_women_chapters, pp) for pp in pec

counts = Table().with_columns([
        'Amy', people_counts['Amy'],
        'Beth', people_counts['Beth'],
        'Jo', people_counts['Jo'],
        'Laurie', people_counts['Laurie'],
        'Meg', people_counts['Meg']
    ])
```

In [17]:
```
counts
```

Out[17]:

Amy	Beth	Jo	Laurie	Meg
23	26	44	0	26
13	12	21	0	20
2	2	62	16	36
14	18	34	0	17
6	14	55	35	13
6	28	13	9	5
27	5	9	7	5
48	9	71	17	16
3	5	21	24	71
5	5	12	4	4

... (37 rows omitted)

In [18]:
```
#again, followig code fails since cumsum is no longer function in datascien

#cum_counts = counts.cumsum().with_column('Chapter', np.arange(1, 48, 1))
#cum_counts.plot(column_for_xticks=5)
#plots.title('Cumulative Number of Times Name Appears');
```

In [19]:
```
# In each chapter, count the number of all characters;
# call this the "length" of the chapter.
# Also count the number of periods.

chars_periods_hf = Table().with_columns([
        'HF Chapter Length', [len(s) for s in huck_finn_chapters],
        'Number of Periods', np.char.count(huck_finn_chapters, '.')
    ])
chars_periods_lw = Table().with_columns([
        'LW Chapter Length', [len(s) for s in little_women_chapters],
        'Number of Periods', np.char.count(little_women_chapters, '.')
    ])
```

In [20]:
```
# The counts for Huckleberry Finn

chars_periods_hf
```

Out[20]:

HF Chapter Length	Number of Periods
7137	66
12198	117
8674	72
6957	84
8333	91
14772	125
13446	127
22668	249
8200	71
7165	70

... (33 rows omitted)

In [21]:
```
# The counts for Little Women

chars_periods_lw
```

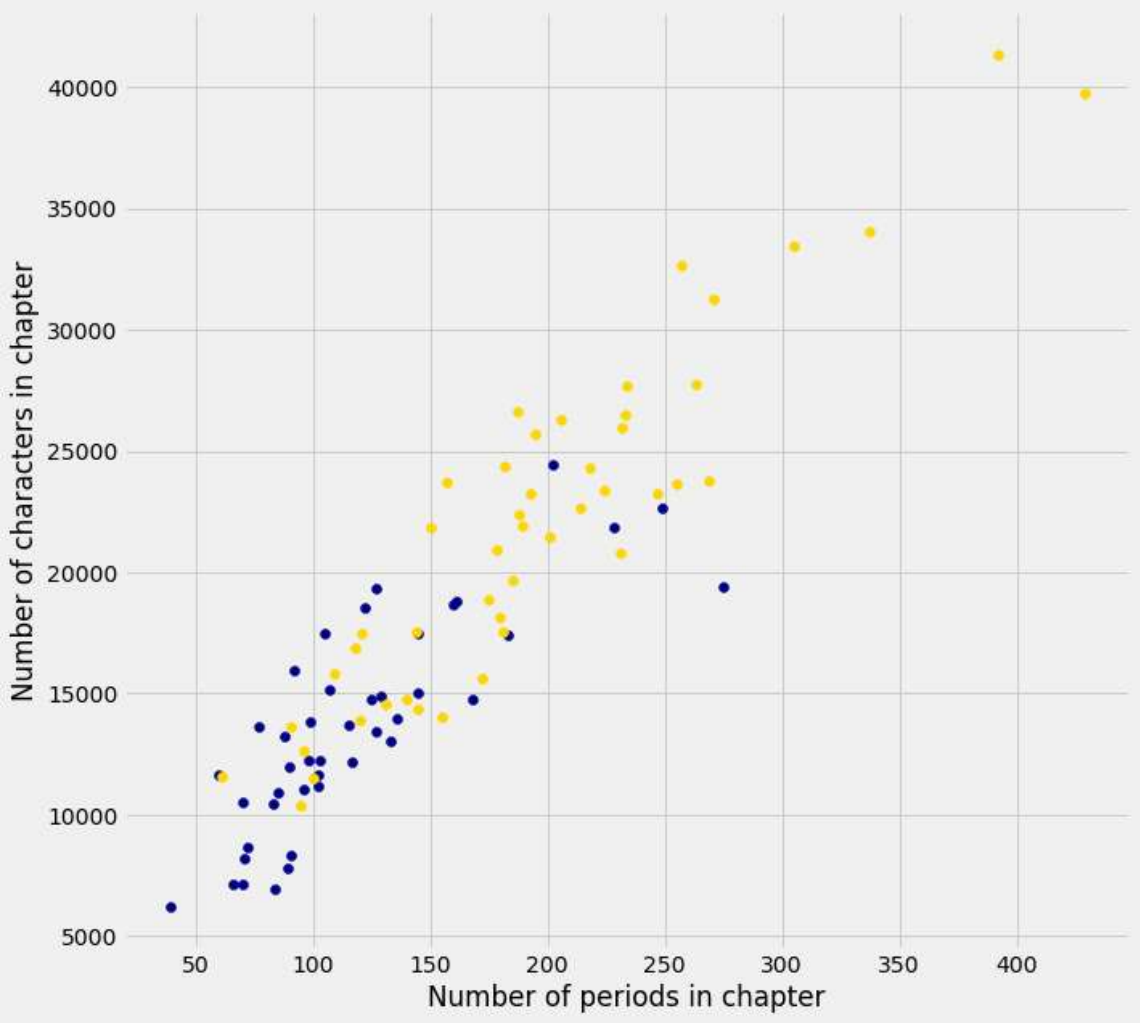
Out[21]:

LW 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)

In [22]:

```
plots.figure(figsize=(10,10))
plots.scatter(chars_periods_hf[1], chars_periods_hf[0], color='darkblue')
plots.scatter(chars_periods_lw[1], chars_periods_lw[0], color='gold')
plots.xlabel('Number of periods in chapter')
plots.ylabel('Number of characters in chapter');
```



In [ ]:

In [ ]: