Leatherman Side Project

January 3, 2024

1 Project Goals

To create an overview of data careers with the intent of helping those just entering the field to be familiar with it. We want to use data to help students decide on what to focus on if they want to be competitive with the rest of the field. This project was created by Practicum by Yandex.

Data is taken from New Coder (freecodecamp), Stack Overflow, and JetBrains global surveys of users. This allows a variety of responses from each source, but each must be understood for the biases it may present, such as New Coders only showing information from those about to or just joining the job market.

The ultimate goal of this project is to help the company offer useful and accurate representation and reccomendations to those who are interested in pursuing a data career.

```python
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import numpy as np
sns.set_palette("bone")
```

Imported necessary packages, set seaborn palette for consistency.

```python
def hcountplot(data):
    ax = sns.countplot(y=data, palette="bone_r", order=data.value_counts().
     ↪index)
    ax.set(xlabel='count', ylabel='')
```

```python
def countplot(data):
    ax = sns.countplot(x=data, palette="bone_r", order=data.value_counts().
     ↪index)
    ax.set(ylabel='count', xlabel='')
```

```python
def hcountplotlimit(data, limit):
    ax = sns.countplot(y=data, palette="bone_r", order=data.value_counts().
     ↪iloc[:limit].index)
    ax.set(xlabel='count', ylabel='')
```

```python
def hcountplotmelt(data):
    melt_data = pd.melt(data)
```

```
    ax = sns.countplot(y=melt_data['value'], palette="bone_r",␣
 ↪order=melt_data['value'].value_counts().index)
    ax.set(xlabel='count', ylabel='')
```

```
[ ]: def hcountplotmeltlimit(data, limit):
    melt_data = pd.melt(data)
    ax = sns.countplot(y=melt_data['value'], palette="bone_r",␣
 ↪order=melt_data['value'].value_counts().iloc[:limit].index)
    ax.set(xlabel='count', ylabel='')
```

Defined functions for plotting to ensure uniformity.

```
[ ]: newcoder = pd.read_csv('datasets/newcoder.csv')
     newcoder.head()
```

```
[ ]:                                    #  \
     0  daa5a89d67d6028fd3d9dac2d90164fa
     1  f5cb7e8319cb044276e037519e3b29af
     2  79da19c872d3f8634a59d5a4b88af387
     3  420091450f66a1adac4e97d2a077ac60
     4  03930f6c0420c560f27c516eaa5a272e

        Are you already working as a software developer?  \
     0                                               0.0
     1                                               NaN
     2                                               0.0
     3                                               0.0
     4                                               0.0

        Is this your first software development job?  \
     0                                           NaN
     1                                           NaN
     2                                           NaN
     3                                           NaN
     4                                           NaN

        Before you got this job, how many months did you spend looking for a job?  \
     0                                                NaN
     1                                                NaN
     2                                                NaN
     3                                                NaN
     4                                                NaN

          Would you prefer to…  Full-Stack Web Developer  Back-End Web Developer  \
     0      work for a startup  Full-Stack Web Developer                     NaN
     1                     NaN                       NaN                     NaN
     2      work for a startup  Full-Stack Web Developer  Back-End Web Developer
```

```
3  start your own business                          NaN                    NaN
4     work for a nonprofit                          NaN                    NaN


   Front-End Web Developer  Mobile Developer DevOps / SysAdmin  … \
0  Front-End Web Developer  Mobile Developer             NaN  …
1                     NaN               NaN             NaN  …
2  Front-End Web Developer  Mobile Developer             NaN  …
3                     NaN               NaN             NaN  …
4  Front-End Web Developer               NaN             NaN  …


             Which field do you work in?  \
0                               NaN
1                               NaN
2                               NaN
3  arts, entertainment, sports, or media
4                               NaN


  About how much money did you make last year (in US dollars)?  \
0                                               NaN
1                                               NaN
2                                               NaN
3                                           40000.0
4                                               NaN


  About how many minutes does it take you to get to work each day?  \
0                                               NaN
1                                               NaN
2                                               NaN
3                                  45 to 60 minutes
4                                               NaN


  Do you consider yourself under-employed?  \
0                               NaN
1                               NaN
2                               NaN
3                               1.0
4                               NaN


  Have you served in your country's military before?  \
0                                              0.0
1                                              NaN
2                                              0.0
3                                              0.0
4                                              0.0


  Do you receive disability benefits from your government?  \
0                                              0.0
```

```
1                                                                 NaN
2                                                                 0.0
3                                                                 0.0
4                                                                 0.0

    Do you have high speed internet at your home?       Start Date (UTC)  \
0                                              1.0   2018-12-19 17:52:44
1                                              NaN   2018-12-19 10:50:04
2                                              1.0   2018-12-13 08:19:36
3                                              1.0   2018-12-07 08:59:03
4                                              1.0   2018-12-06 21:53:50

        Submit Date (UTC)  Network ID
0     2018-12-19 19:53:45  9051df1e04
1     2018-12-19 10:50:37  37f3d43b62
2     2018-12-13 09:24:25  56373d7fe6
3     2018-12-07 09:02:38  b9beee0808
4     2018-12-06 22:00:21  79ad704512

[5 rows x 136 columns]
```

```python
newcoder.iloc[:,5:18] = newcoder.iloc[:,5:18].notnull().astype('int')
newcoder.head()
```

```
                                      #  \
0   daa5a89d67d6028fd3d9dac2d90164fa
1   f5cb7e8319cb044276e037519e3b29af
2   79da19c872d3f8634a59d5a4b88af387
3   420091450f66a1adac4e97d2a077ac60
4   03930f6c0420c560f27c516eaa5a272e

    Are you already working as a software developer?  \
0                                              0.0
1                                              NaN
2                                              0.0
3                                              0.0
4                                              0.0

    Is this your first software development job?  \
0                                          NaN
1                                          NaN
2                                          NaN
3                                          NaN
4                                          NaN

    Before you got this job, how many months did you spend looking for a job?  \
0                                              NaN
```

4

```
1                                                    NaN
2                                                    NaN
3                                                    NaN
4                                                    NaN

    Would you prefer to…  Full-Stack Web Developer  Back-End Web Developer  \
0        work for a startup                         1                      0
1                       NaN                         0                      0
2        work for a startup                         1                      1
3  start your own business                         0                      0
4      work for a nonprofit                         0                      0

   Front-End Web Developer  Mobile Developer  DevOps / SysAdmin  …  \
0                        1                 1                  0  …
1                        0                 0                  0  …
2                        1                 1                  0  …
3                        0                 0                  0  …
4                        1                 0                  0  …

              Which field do you work in?  \
0                                     NaN
1                                     NaN
2                                     NaN
3  arts, entertainment, sports, or media
4                                     NaN

   About how much money did you make last year (in US dollars)?  \
0                                                NaN
1                                                NaN
2                                                NaN
3                                            40000.0
4                                                NaN

   About how many minutes does it take you to get to work each day?  \
0                                                NaN
1                                                NaN
2                                                NaN
3                                   45 to 60 minutes
4                                                NaN

   Do you consider yourself under-employed?  \
0                                      NaN
1                                      NaN
2                                      NaN
3                                      1.0
4                                      NaN
```

```
     Have you served in your country's military before?  \
0                                                   0.0
1                                                   NaN
2                                                   0.0
3                                                   0.0
4                                                   0.0

     Do you receive disability benefits from your government?  \
0                                                   0.0
1                                                   NaN
2                                                   0.0
3                                                   0.0
4                                                   0.0

     Do you have high speed internet at your home?      Start Date (UTC)  \
0                                              1.0   2018-12-19 17:52:44
1                                              NaN   2018-12-19 10:50:04
2                                              1.0   2018-12-13 08:19:36
3                                              1.0   2018-12-07 08:59:03
4                                              1.0   2018-12-06 21:53:50

       Submit Date (UTC)  Network ID
0    2018-12-19 19:53:45  9051df1e04
1    2018-12-19 10:50:37  37f3d43b62
2    2018-12-13 09:24:25  56373d7fe6
3    2018-12-07 09:02:38  b9beee0808
4    2018-12-06 22:00:21  79ad704512

[5 rows x 136 columns]
```

```python
ncdata = newcoder[(newcoder.iloc[:,10]==1) | (newcoder.iloc[:,17]==1)]
ncdatascientist = newcoder[newcoder.iloc[:,10]==1]
ncdataengineer = newcoder[newcoder.iloc[:,17]==1]
```

Changed column values for data careers for easier separating. Separated NC data into data careers, data scientist, and data engineer.

```python
col_mapping = [f"{c[0]}:{c[1]}" for c in enumerate(newcoder.columns)]
col_mapping
```

```
['0:#',
 '1:Are you already working as a software developer?',
 '2:Is this your first software development job?',
 '3:Before you got this job, how many months did you spend looking for a job?',
 '4:Would you prefer to…',
 '5:Full-Stack Web Developer',
 '6:Back-End Web Developer',
 '7:Front-End Web Developer',
```

```
'8:Mobile Developer',
'9:DevOps / SysAdmin',
'10:Data Scientist',
'11:Teacher / Trainer / Developer Evangelist',
'12:Quality Assurance Engineer',
'13:User Experience Designer',
'14:Product Manager',
'15:Game Developer',
'16:Information Security',
'17:Data Engineer',
'18:Other',
'19:When do you plan to start applying for developer jobs?',
'20:About how much money do you expect to earn per year at your first developer
job (in US Dollars)?',
'21:Would you prefer to work…',
'22:Are you willing to relocate for a job?',
'23:What is your biggest reason for learning to code?',
'24:Other.1',
'25:freeCodeCamp',
'26:Mozilla Developer Network (MDN)',
'27:Stack Overflow',
'28:EdX',
'29:Coursera',
'30:Khan Academy',
'31:Pluralsight',
'32:Codecademy',
'33:Udacity',
'34:Udemy',
'35:Code Wars',
'36:Treehouse',
'37:HackerRank',
'38:Front End Masters',
'39:Lynda.com',
'40:Egghead.io',
'41:CSS Tricks',
'42:Other.2',
'43:freeCodeCamp study groups',
'44:hackathons',
'45:conferences',
'46:workshops',
'47:Startup Weekend',
'48:NodeSchool',
'49:Women Who Code',
'50:Girl Develop It',
'51:CoderDojo',
'52:Meetup.com events',
'53:RailsBridge',
```

```
'54:Game Jam',
'55:Rails Girls',
'56:Django Girls',
'57:weekend bootcamps',
'58:Other.3',
'59:The freeCodeCamp Podcast',
'60:Code Newbie',
'61:The Changelog',
'62:Software Engineering Daily',
'63:JavaScript Jabber',
'64:Syntax.fm',
'65:Learn To Code With Me',
'66:Full Stack Radio',
'67:Front End Happy Hour',
'68:Coding Blocks',
'69:Shop Talk Show',
'70:Developer Tea',
'71:Programming Throwdown',
'72:Geek Speak',
'73:Hanselminutes',
'74:Talk Python To Me',
'75:Ruby Rogues',
'76:CodePen Radio',
'77:Software Engineering Radio',
'78:Other.4',
'79:MIT Open Courseware',
"80:freeCodeCamp's YouTube channel",
'81:Computerphile',
'82:DevTips',
'83:CS Dojo',
'84:Engineered Truth',
'85:LearnCode.Academy',
'86:LevelUpTuts',
'87:Fun Fun Function',
'88:Coding Tutorials 360',
'89:Coding Train',
'90:Derek Banas',
'91:Simplilearn',
'92:Simple Programmer (Bulldog Mindset)',
'93:Mozilla Hacks',
'94:Google Developers',
'95:Other.5',
'96:About how many hours do you spend learning each week?',
'97:About how many months have you been programming for?',
'98:Have you attended a full-time coding bootcamp?',
'99:Which one?',
'100:Have you finished yet?',
```

```
 '101:Did you take out a loan to pay for the bootcamp?',
 '102:Based on your experience, would you recommend this bootcamp to your
friends?',
 '103:Aside from university tuition, about how much money have you spent on
learning to code so far (in US dollars)?',
 '104:How old are you?',
 "105:What's your gender?",
 '106:Other.6',
 '107:Which country are you a citizen of?',
 '108:Which country do you currently live in?',
 '109:About how many people live in your city?',
 '110:Are you an ethnic minority in your country?',
 '111:Which language do you you speak at home with your family?',
 "112:What's the highest degree or level of school you have completed?",
 '113:What was the main subject you studied in university?',
 "114:What's your marital status?",
 '115:Do you financially support any dependents?',
 '116:Do you have children?',
 '117:How many children do you have?',
 '118:Do you financially support any elderly relatives or relatives with
disabilities?',
 '119:Do you have any debt?',
 '120:Do you have a home mortgage?',
 '121:About how much do you owe on your home mortgage (in US Dollars)?',
 '122:Do you have student loan debt?',
 '123:About how much do you owe in student loans (in US Dollars)?',
 '124:Regarding employment status, are you currently…',
 '125:Other.7',
 '126:Which field do you work in?',
 '127:About how much money did you make last year (in US dollars)?',
 '128:About how many minutes does it take you to get to work each day?',
 '129:Do you consider yourself under-employed?',
 "130:Have you served in your country's military before?",
 '131:Do you receive disability benefits from your government?',
 '132:Do you have high speed internet at your home?',
 '133:Start Date (UTC)',
 '134:Submit Date (UTC)',
 '135:Network ID']
```

Created indexed list of columns, now we can use .iloc instead of writing out full column names.

```
[ ]: newcoder.iloc[:,4].value_counts()
```

```
[ ]: freelance                            5264
     work for a medium-sized company      5216
     start your own business              5130
     work for a multinational corporation 4296
     work for a startup                   3510
```

```
work for a nonprofit                    1353
work for a government                    970
Name: Would you prefer to…, dtype: int64
```

[ ]: `hcountplot(ncdata.iloc[:,4])`
    `plt.title('Where do new coders want to work? (New Coder)')`

[ ]: Text(0.5, 1.0, 'Where do new coders want to work? (New Coder)')

Where do new coders want to work? (New Coder)

```
work for a multinational corporation ┤
work for a medium-sized company ┤
work for a startup ┤
work for a nonprofit ┤
work for a government ┤
                          0   200  400  600  800  1000  1200  1400
                                          count
```
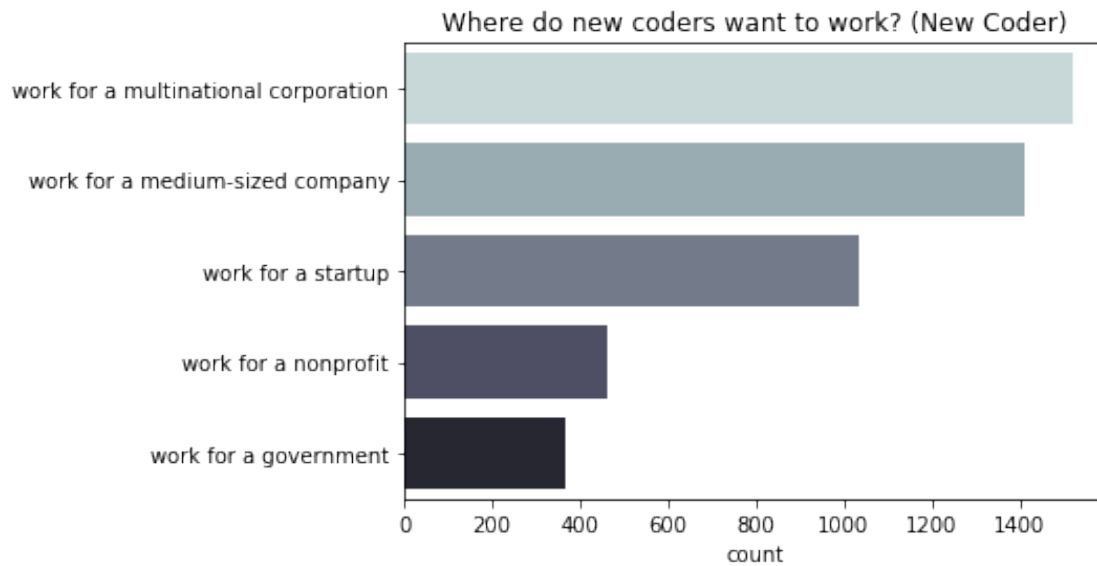
Converted multiple choice strings to 1/0 for easy filtering.

[ ]: `hcountplot(ncdata.iloc[:,21])`
    `plt.title('Where do new coders want to work? (New Coder)')`

[ ]: Text(0.5, 1.0, 'Where do new coders want to work? (New Coder)')

Where do new coders want to work? (New Coder)
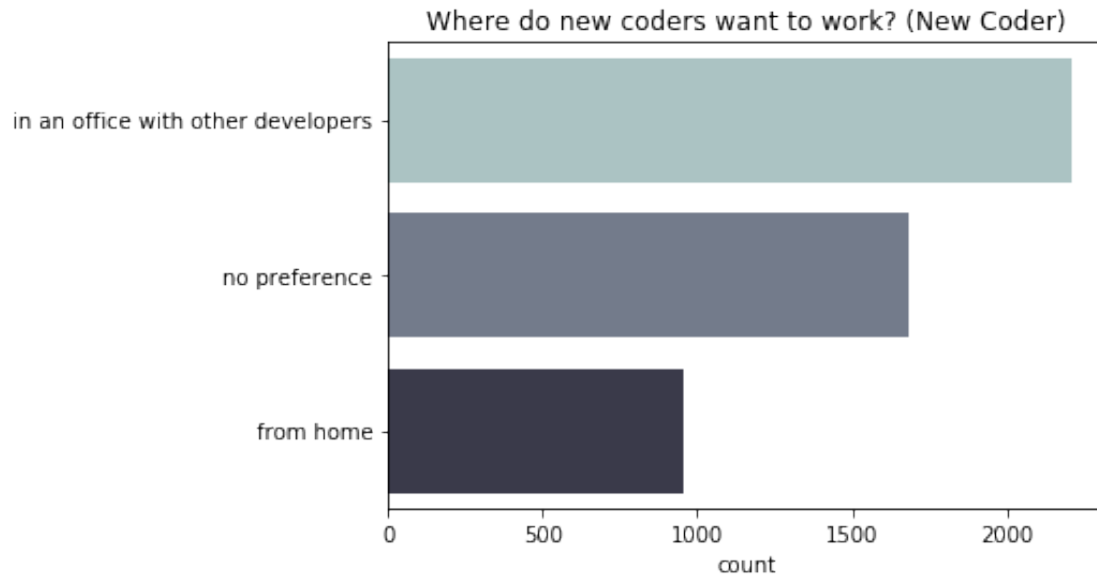

```
[ ]: newcoder.iloc[:,25:58] = newcoder.iloc[:,25:58].notnull().astype('int')
     newcoder.iloc[:,25:58]
```

```
[ ]:       freeCodeCamp  Mozilla Developer Network (MDN)  Stack Overflow  EdX  \
     0                 1                               1               1    0
     1                 0                               0               0    0
     2                 0                               0               0    0
     3                 1                               0               0    0
     4                 1                               0               0    0
     ...             ...                             ...             ...  ...
     31221             1                               1               1    0
     31222             1                               1               1    0
     31223             1                               1               1    1
     31224             0                               1               0    0
     31225             0                               0               0    0

            Coursera  Khan Academy  Pluralsight  Codecademy  Udacity  Udemy  ...  \
     0              0             0            0           0        1      0  ...
     1              0             0            0           0        0      0  ...
     2              0             0            0           1        0      0  ...
     3              0             0            0           1        0      0  ...
     4              0             0            0           0        0      0  ...
     ...          ...           ...          ...         ...      ...    ...  ...
     31221          0             0            0           0        0      1  ...
     31222          1             0            0           1        0      0  ...
     31223          0             1            1           1        0      0  ...
     31224          1             0            0           0        0      0  ...
```

11

```
31225            1              0              0              0          0      1  …
```

```
        NodeSchool  Women Who Code  Girl Develop It  CoderDojo  \
0                0               0                0          0
1                0               0                0          0
2                0               0                0          0
3                0               0                0          0
4                0               0                0          0
...            ...             ...              ...        ...
31221            0               0                0          0
31222            0               0                0          0
31223            0               0                0          0
31224            1               1                1          1
31225            0               0                0          0
```

```
        Meetup.com events  RailsBridge  Game Jam  Rails Girls  Django Girls  \
0                       1            0         0            0             0
1                       0            0         0            0             0
2                       0            0         0            0             0
3                       0            0         0            0             0
4                       0            0         0            0             0
...                   ...          ...       ...          ...           ...
31221                   0            0         0            0             0
31222                   0            0         0            0             0
31223                   0            0         0            0             0
31224                   1            1         1            1             1
31225                   1            0         0            0             0
```

```
        weekend bootcamps
0                       0
1                       0
2                       0
3                       0
4                       0
...                   ...
31221                   0
31222                   0
31223                   0
31224                   1
31225                   1
```

```
[31226 rows x 33 columns]
```

```python
newcoder.iloc[:,59:95] = newcoder.iloc[:,59:95].notnull().astype('int')
newcoder.iloc[:,59:95]
```

```
[ ]:          The freeCodeCamp Podcast   Code Newbie   The Changelog  \
      0                             0             0               0
      1                             0             0               0
      2                             0             0               0
      3                             1             1               0
      4                             0             0               0
      ...                         ...           ...             ...
      31221                         1             0               0
      31222                         1             1               0
      31223                         0             0               0
      31224                         0             1               0
      31225                         0             0               0

             Software Engineering Daily   JavaScript Jabber   Syntax.fm  \
      0                                0                   1           0
      1                                0                   0           0
      2                                0                   0           0
      3                                0                   0           0
      4                                0                   0           0
      ...                            ...                 ...         ...
      31221                            0                   0           0
      31222                            0                   1           0
      31223                            0                   0           0
      31224                            0                   0           0
      31225                            1                   1           1

             Learn To Code With Me   Full Stack Radio   Front End Happy Hour  \
      0                          0                  0                      0
      1                          0                  0                      0
      2                          0                  0                      0
      3                          0                  0                      0
      4                          0                  0                      0
      ...                      ...                ...                    ...
      31221                      0                  0                      0
      31222                      1                  1                      1
      31223                      0                  0                      0
      31224                      0                  0                      0
      31225                      0                  0                      0

             Coding Blocks  …  LearnCode.Academy   LevelUpTuts   Fun Fun Function  \
      0                  0  …                  0             0                  0
      1                  0  …                  0             0                  0
      2                  0  …                  1             0                  0
      3                  0  …                  0             0                  0
      4                  0  …                  0             0                  0
      ...              ...  …                ...           ...                ...
      31221              0  …                  0             0                  0
```

```
31222                0  …                    0            0                    1
31223                0  …                    0            0                    0
31224                0  …                    0            0                    0
31225                1  …                    0            0                    0

         Coding Tutorials 360  Coding Train  Derek Banas  Simplilearn  \
0                           0             0            1            0
1                           0             0            0            0
2                           0             0            0            0
3                           0             0            0            0
4                           0             0            0            0
...                       ...           ...          ...          ...
31221                       0             0            0            0
31222                       1             1            0            0
31223                       0             0            0            0
31224                       0             0            0            0
31225                       0             0            0            0

         Simple Programmer (Bulldog Mindset)  Mozilla Hacks  Google Developers
0                                          0              0                  0
1                                          0              0                  0
2                                          0              0                  0
3                                          0              0                  0
4                                          0              0                  0
...                                      ...            ...                ...
31221                                      0              0                  0
31222                                      1              1                  1
31223                                      0              0                  0
31224                                      0              0                  0
31225                                      0              0                  1

[31226 rows x 36 columns]
```

Changed values to 1/0 in selected columns to make it easier to manipulate.

```
[ ]: newcoder.iloc[:,99].value_counts()
```

```
[ ]: General Assembly           45
     Thinkful                   27
     DevMountain                26
     4Geeks Academy             24
     IronHack                   21
                                ..
     Nashville Software School   1
     MakerSquare                 1
     Hackership                  1
     Ladies Learning Code        1
     We Got Coders               1
```

```
Name: Which one?, Length: 163, dtype: int64
```

```
[ ]: hcountplotlimit(ncdata.iloc[:,99], 19)
     plt.title('Which Bootcamps did Data Students Attend? (New Coder)')
```

```
[ ]: Text(0.5, 1.0, 'Which Bootcamps did Data Students Attend? (New Coder)')
```

Which Bootcamps did Data Students Attend? (New Coder)

General Assembly · Coding Dojo · Flatiron School · Thinkful · 4Geeks Academy · The Coding Boot Camp at UCLA Extension · Fullstack Academy · University of Texas at Austin Coding Bootcamp · Bloc.io · IronHack · Rutgers Coding Bootcamp · DigitalCrafts · The Hacking School · Galvanize · Coder Factory · LEARN Academy · Tech Elevator · Code 42 · Tech Academy Portland

count: 0 1 2 3 4 5 6 7

Limited bootcamps listed to the ones with a count of more than 1. Overall counts are low, not much to conclude from this.

```
[ ]: ncdatascientist.iloc[:,127].describe()
```

```
[ ]: count    1.732000e+03
     mean     3.293246e+04
     std      7.146492e+04
     min      0.000000e+00
     25%      7.960000e+03
     50%      2.500000e+04
     75%      4.500000e+04
     max      2.525300e+06
     Name: About how much money did you make last year (in US dollars)?, dtype:
     float64
```

```
[ ]: ncdataengineer.iloc[:,127].describe()
```

```
[ ]: count    1.303000e+03
     mean     3.331428e+04
     std      7.641037e+04
     min      0.000000e+00
     25%      1.000000e+04
```

```
50%      2.500000e+04
75%      4.500000e+04
max      2.525300e+06
Name: About how much money did you make last year (in US dollars)?, dtype:
float64
```

```
[ ]: ax = sns.distplot(ncdatascientist.iloc[:,127], bins=500, color='grey')
     ax = sns.distplot(ncdataengineer.iloc[:,127], bins=500, color='navy')
     plt.xlim(0,100000)
     plt.legend(['Data Scientist', 'Data Engineer'])
     plt.title('Last Year Salary for Data Careers (New Coder)')
```

```
[ ]: Text(0.5, 1.0, 'Last Year Salary for Data Careers (New Coder)')
```
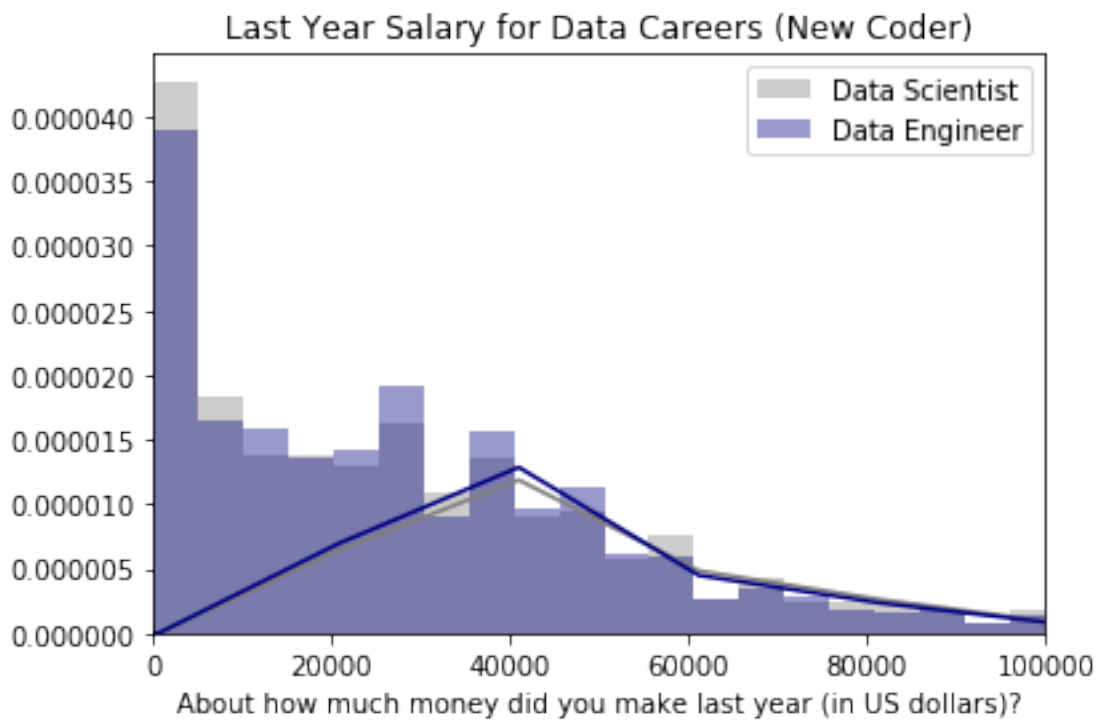

Last year salary for new coders fairly similar, both medians around 25000. Means around 33000

```
[ ]: ncdatascientist.iloc[:,20].describe()
```

```
[ ]: count      3472.000000
     mean      53099.678283
     std       79329.613741
     min           0.000000
     25%       20000.000000
     50%       50000.000000
```

16

```
75%          65000.000000
max        1000000.000000
Name: About how much money do you expect to earn per year at your first
developer job (in US Dollars)?, dtype: float64
```

[ ]: `ncdataengineer.iloc[:,20].describe()`

[ ]:
```
count       2579.000000
mean       52632.157425
std        73016.841331
min            0.000000
25%        20000.000000
50%        50000.000000
75%        65000.000000
max      1000000.000000
Name: About how much money do you expect to earn per year at your first
developer job (in US Dollars)?, dtype: float64
```

[ ]:
```python
ax = sns.distplot(ncdatascientist.iloc[:,20], bins=100, color='grey')
ax = sns.distplot(ncdataengineer.iloc[:,20], bins=100, color='navy')
plt.xlim(0,100000)
plt.legend(['Data Scientist', 'Data Engineer'])
plt.title('Expected New Salary for Data Careers (New Coder)')
```

[ ]: `Text(0.5, 1.0, 'Expected New Salary for Data Careers (New Coder)')`
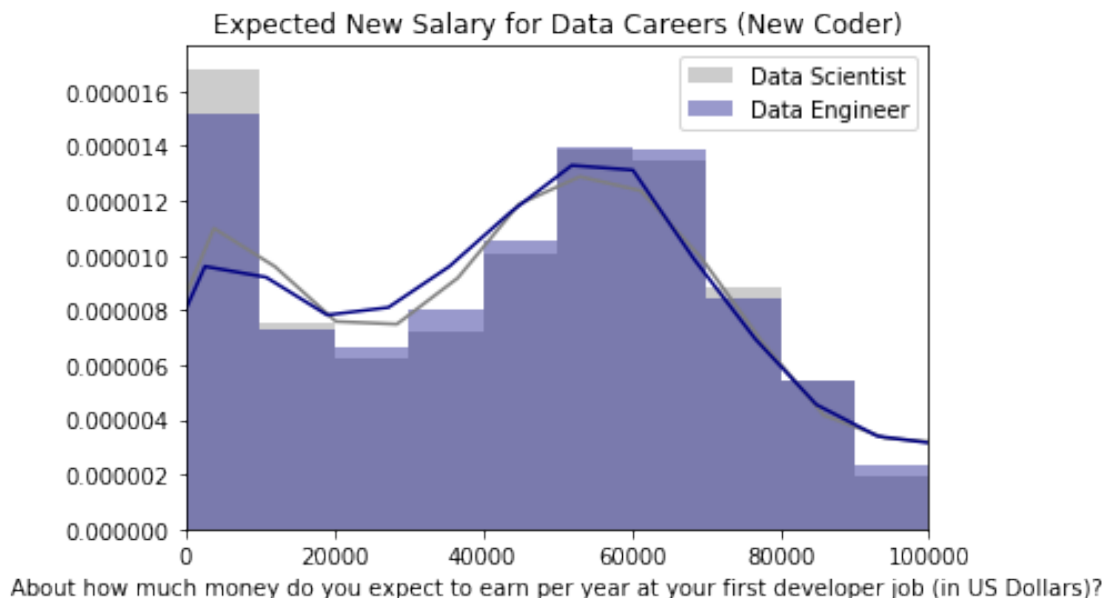
Expected income similar as well, median at 50000, means at 53000

```
ncdata.iloc[:,98].value_counts()
```

```
0.0    4583
1.0     180
Name: Have you attended a full-time coding bootcamp?, dtype: int64
```

```
ncdatascientist.iloc[:,98].value_counts()
```

```
0.0    3658
1.0     147
Name: Have you attended a full-time coding bootcamp?, dtype: int64
```

```
ncdataengineer.iloc[:,98].value_counts()
```

```
0.0    2676
1.0     100
Name: Have you attended a full-time coding bootcamp?, dtype: int64
```

```
plt.figure(figsize=(3,3))
countplot(ncdata.iloc[:,98])
plt.title('Data workers who attended a boot camp (New Coder)')
plt.xticks(np.arange(2), ('No','Yes'))
```

```
([<matplotlib.axis.XTick at 0x1e70eddfdc8>,
  <matplotlib.axis.XTick at 0x1e70f060a08>],
 <a list of 2 Text xticklabel objects>)
```


Data workers who attended a boot camp (New Coder)
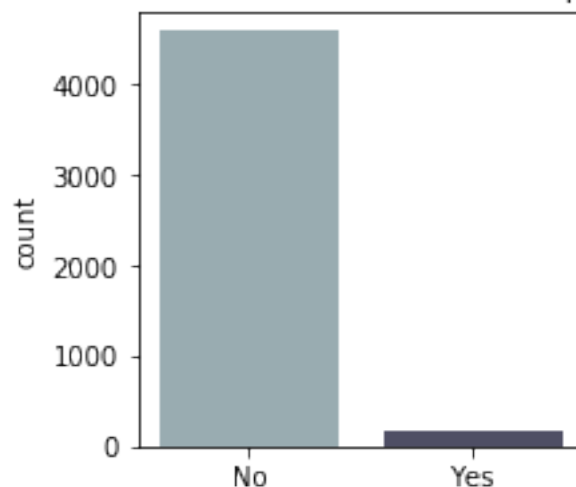
Similar stats about attending bootcamps across careers.

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```
ncdatascientist.iloc[:,96].describe()
```

```
count     3530.000000
mean        14.849575
std         15.567285
min          0.000000
25%          5.000000
50%         10.000000
75%         20.000000
max        168.000000
Name: About how many hours do you spend learning each week?, dtype: float64
```

```
ncdataengineer.iloc[:,96].describe()
```

```
count     2567.000000
mean        14.251266
std         14.560607
min          0.000000
25%          5.000000
50%         10.000000
75%         20.000000
max        160.000000
Name: About how many hours do you spend learning each week?, dtype: float64
```

```
ax = sns.distplot(ncdatascientist.iloc[:,96], color='grey')
ax = sns.distplot(ncdataengineer.iloc[:,96], color='navy')
plt.xlim(0,168)
plt.legend(['Data Scientist', 'Data Engineer'])
plt.title('Hours of Study by Data Students (New Coder)')
```

```
Text(0.5, 1.0, 'Hours of Study by Data Students (New Coder)')
```

Hours of Study by Data Students (New Coder)
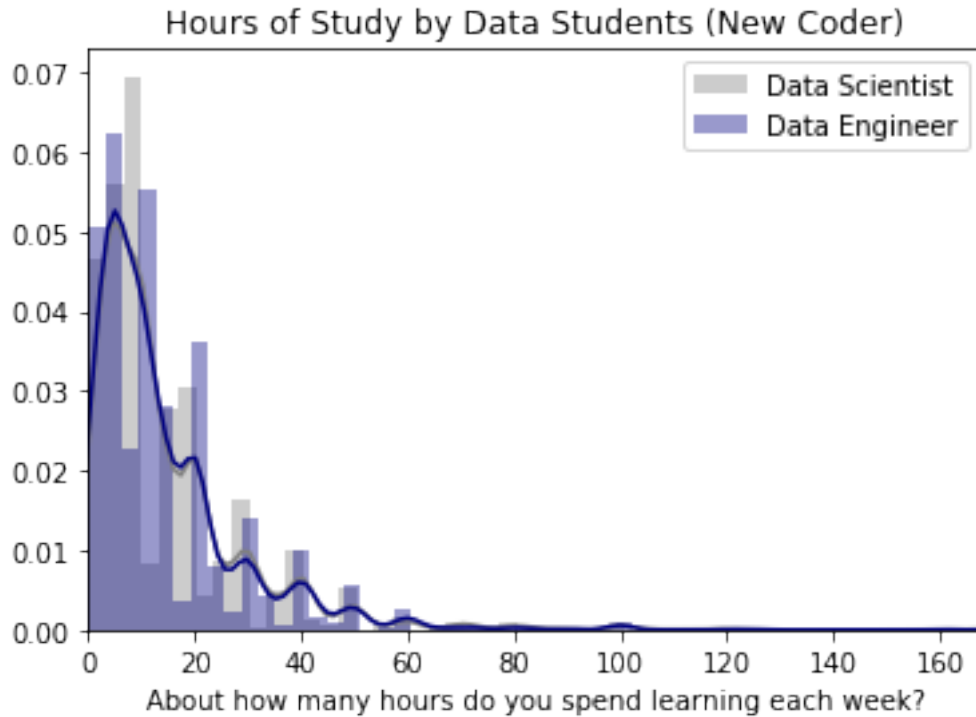
No real difference between careers in hours of study, mean and median are similar.

```
[ ]: ncdatascientist.iloc[:,103].describe()
```

```
[ ]: count        3499.000000
     mean          957.044298
     std         17552.535902
     min             0.000000
     25%             0.000000
     50%             0.000000
     75%           100.000000
     max       1000000.000000
     Name: Aside from university tuition, about how much money have you spent on
     learning to code so far (in US dollars)?, dtype: float64
```

```
[ ]: ncdataengineer.iloc[:,103].describe()
```

```
[ ]: count       2574.000000
     mean         668.505828
     std         4031.969664
     min            0.000000
     25%            0.000000
     50%            0.000000
     75%          100.000000
```

```
max          100000.000000
Name: Aside from university tuition, about how much money have you spent on
learning to code so far (in US dollars)?, dtype: float64
```

```
[ ]: ax = sns.distplot(ncdatascientist.iloc[:,103], bins=1000, color='grey')
     ax = sns.distplot(ncdataengineer.iloc[:,103], bins=1000, color='navy')
     plt.xlim(0,2000)
     plt.legend(['Data Scientist', 'Data Engineer'])
     plt.title('Dollars Spent on Coding outside University (New Coder)')
```

```
[ ]: Text(0.5, 1.0, 'Dollars Spent on Coding outside University (New Coder)')
```


Dollars Spent on Coding outside University (New Coder)

Aside from university tuition, about how much money have you spent on learning to code so far (in US dollars)?
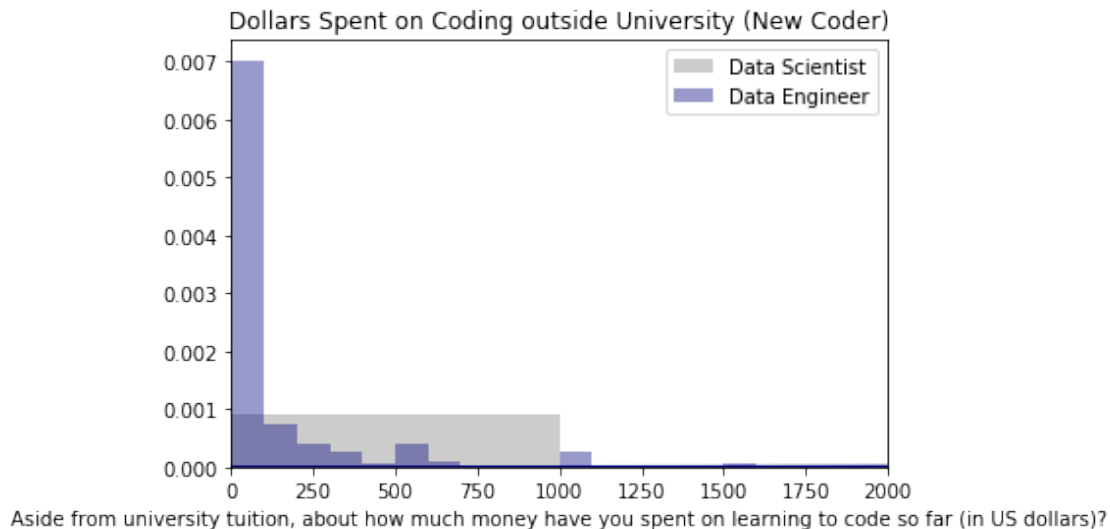
Scientist mean is higher by 300, both medians are around 0. Looks like most people paid nothing outside of university. Makes sense with bootcamp statistics.

```
[ ]: sns.distplot(ncdata.iloc[:,104])
     plt.title('Age of Data Coders (New Coder)')
     plt.xlim(0,100)
```

```
[ ]: (0, 100)
```

Age of Data Coders (New Coder)
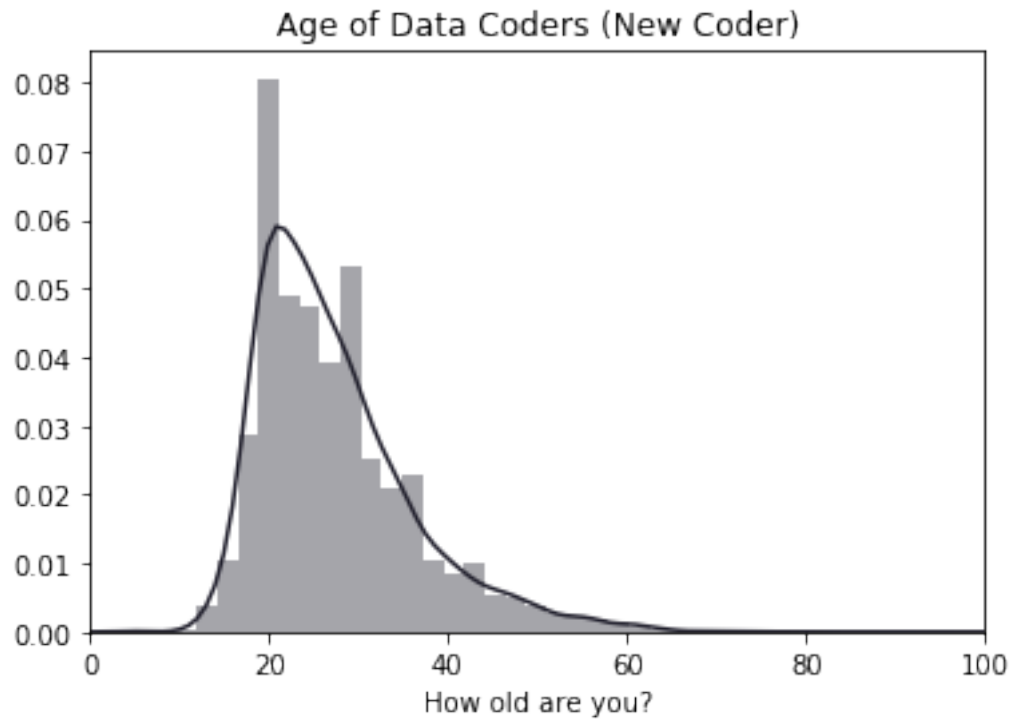
```
[ ]: plt.figure(figsize=(5,2))
     sns.boxplot(ncdata.iloc[:,104], palette="bone_r")
     plt.title('Age of Data Coders (New Coder)')
     plt.xlim(0,100)
```

[ ]: (0, 100)

Age of Data Coders (New Coder)
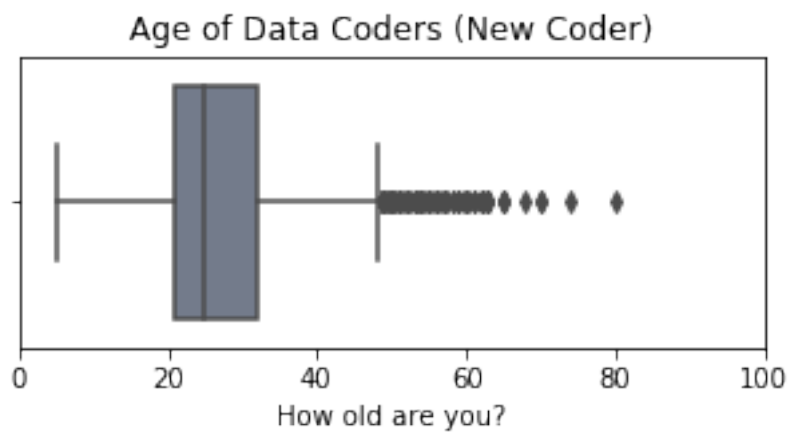
```
[ ]: ncdata.iloc[:,104].describe()
```

```
[ ]: count      4770.000000
     mean         27.434172
     std           9.015629
     min           5.000000
     25%          21.000000
     50%          25.000000
     75%          32.000000
     max         120.000000
     Name: How old are you?, dtype: float64
```

NC ages average around 27, median is close to 25.

```
[ ]: hcountplot(ncdata.iloc[:,105])
     plt.title('Given gender of new coders (New Coder)')
```

```
[ ]: Text(0.5, 1.0, 'Given gender of new coders (New Coder)')
```
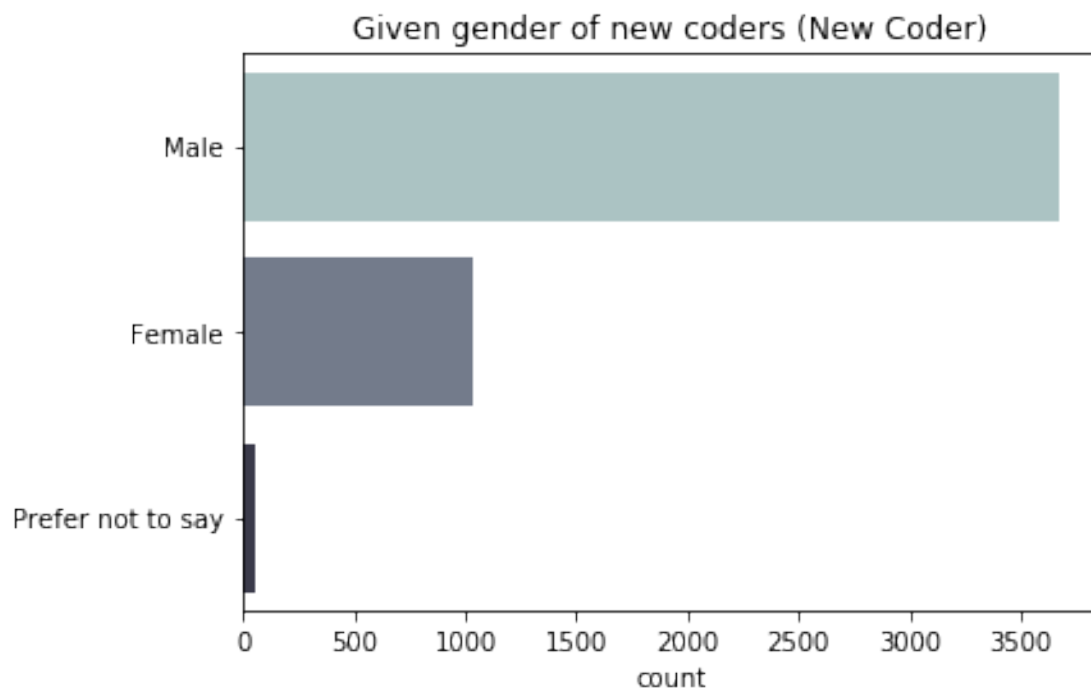


```
[ ]: countplot(ncdata.iloc[:,110])
     plt.title('New Coders that are an Ethnic Minority (New Coder)')
     plt.xticks(np.arange(2), ('No','Yes'))
```

```
[ ]: ([<matplotlib.axis.XTick at 0x1e71104a8c8>,
       <matplotlib.axis.XTick at 0x1e711048f08>],
```

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<a list of 2 Text xticklabel objects>)

New Coders that are an Ethnic Minority (New Coder)
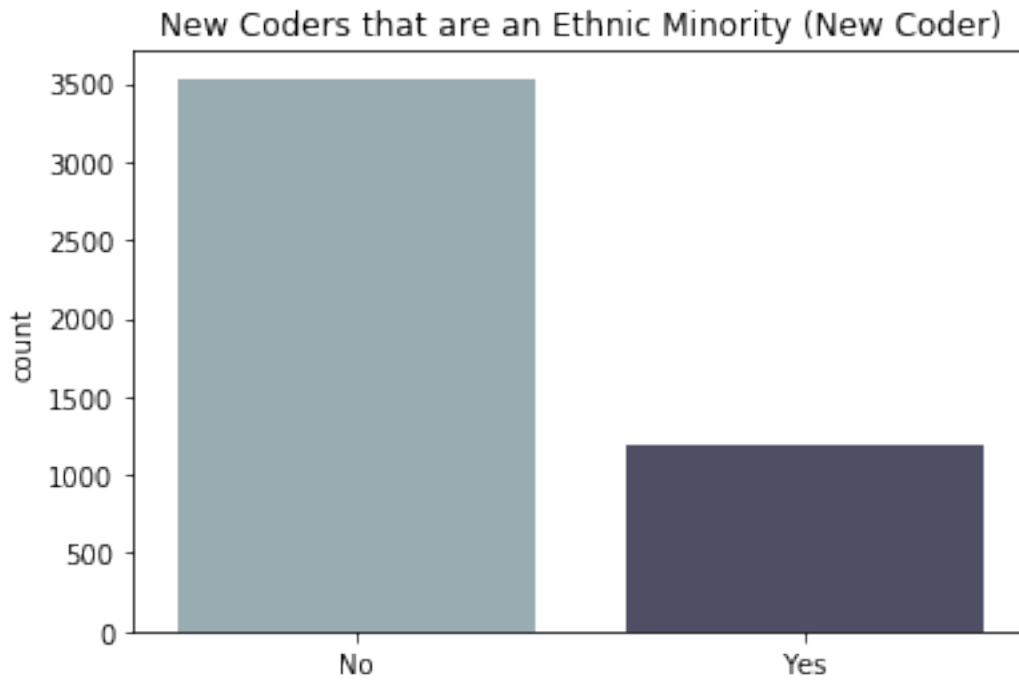

```
[ ]: hcountplotlimit(ncdata.iloc[:,112], 6)
     plt.title('Education in Data Careers (New Coder)')
```

[ ]: Text(0.5, 1.0, 'Education in Data Careers (New Coder)')
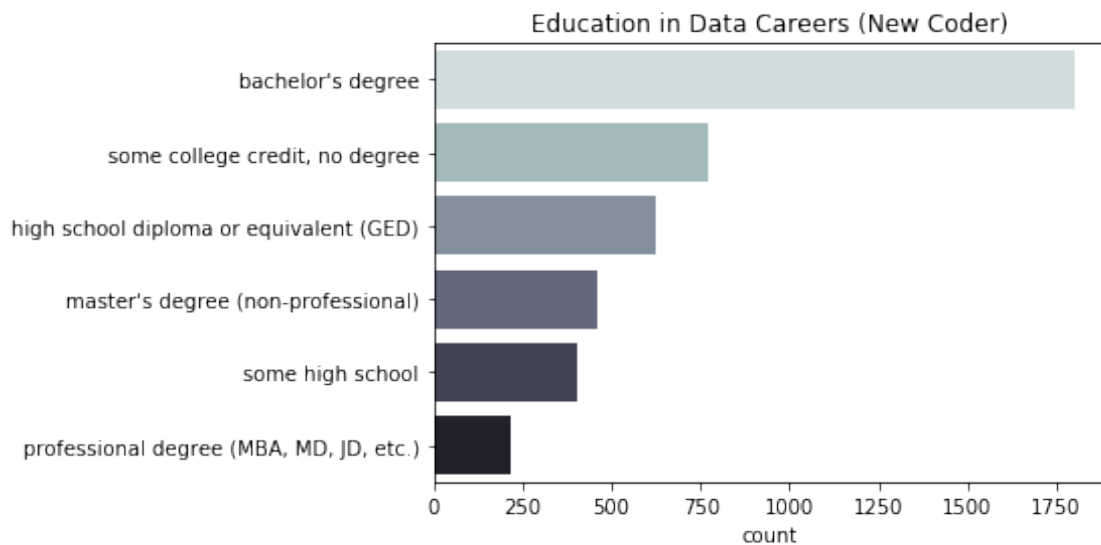
```
hcountplotlimit(ncdatascientist.iloc[:,112], 6)
plt.title('Education in Data Scientists (New Coder)')
```

Text(0.5, 1.0, 'Education in Data Scientists (New Coder)')

Education in Data Scientists (New Coder)
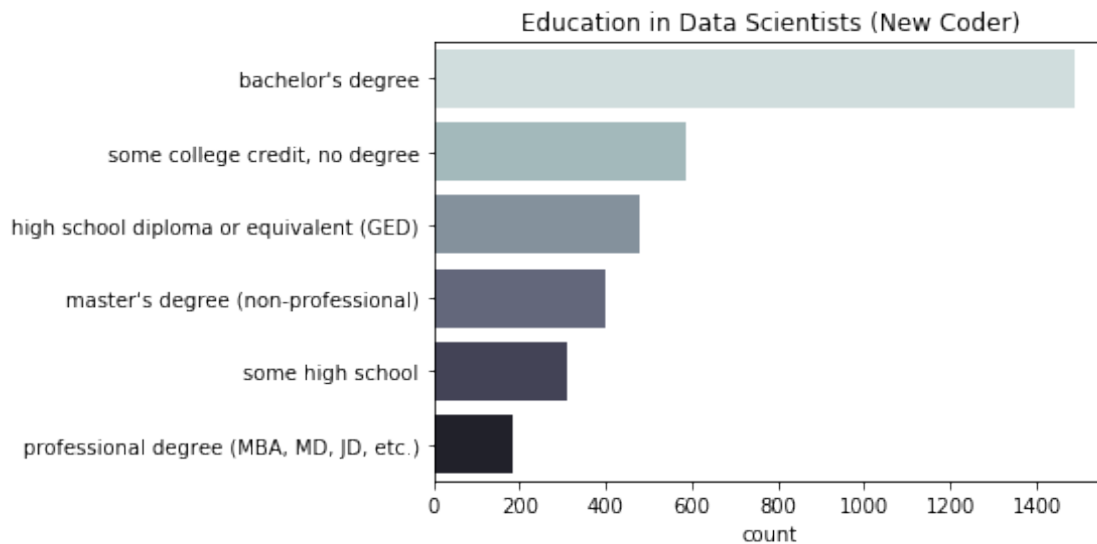
```
hcountplotlimit(ncdataengineer.iloc[:,112], 6)
plt.title('Education in Data Engineers (New Coder)')
```

Text(0.5, 1.0, 'Education in Data Engineers (New Coder)')

Education in Data Engineers (New Coder)

25
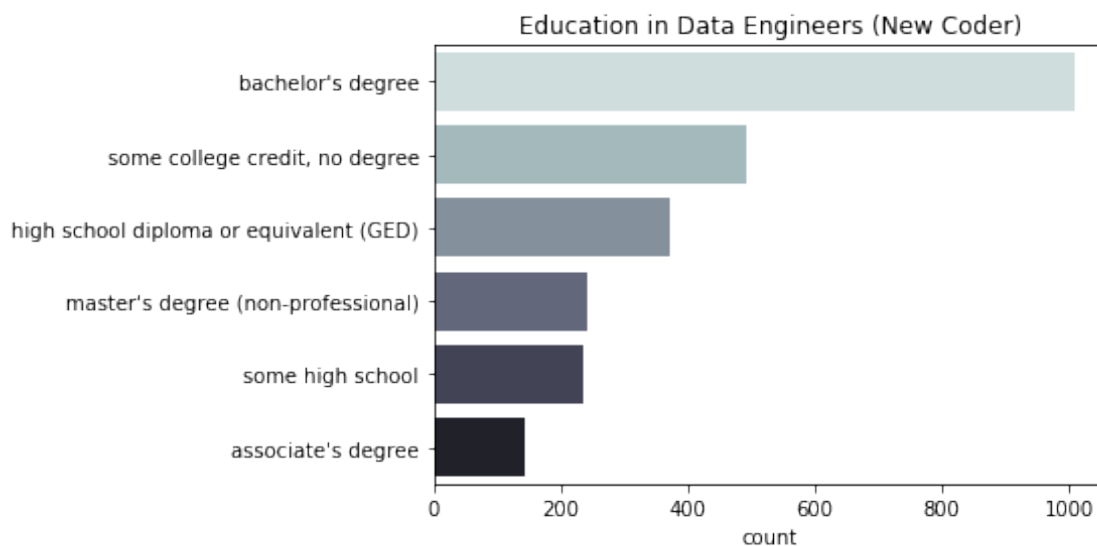
Limited counts of education to most popular. Now we can compare overall data careers with each individual career. No real differences noted.

```
countplot(ncdata.iloc[:,131])
plt.title('New Coders that Recieve Disability (New Coder)')
plt.xticks(np.arange(2), ('No','Yes'))
```

```
([<matplotlib.axis.XTick at 0x1e7111fcb08>,
  <matplotlib.axis.XTick at 0x1e7111fc188>],
 <a list of 2 Text xticklabel objects>)
```

New Coders that Recieve Disability (New Coder)
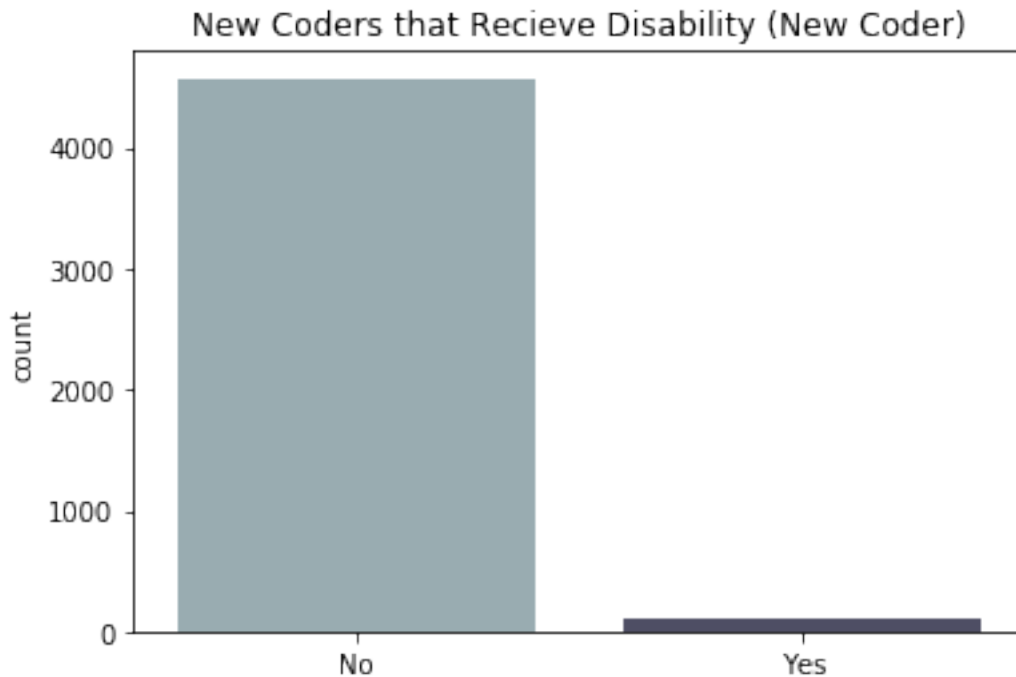
New Coder is able to show us some of the demographics of people just getting into the career. We can't use much of their data to look at the current state of the industry, but we can extrapolate it to those interested in the data career. Mostly, we get a good look at demographics and what they are hoping to find in the career, such as salary and work environment.

2 Stack Overflow

```
so = pd.read_csv('datasets/stackoverflowresults.csv')
so.head()
```

```
   Respondent                          MainBranch Hobbyist  \
0           1      I am a developer by profession      Yes
1           2      I am a developer by profession       No
2           3         I code primarily as a hobby      Yes
```

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```
3            4                      I am a developer by profession      Yes
4            5  I used to be a developer by profession, but no…       Yes

     Age Age1stCode CompFreq  CompTotal  ConvertedComp            Country  \
0    NaN         13  Monthly        NaN            NaN             Germany
1    NaN         19      NaN        NaN            NaN      United Kingdom
2    NaN         15      NaN        NaN            NaN  Russian Federation
3   25.0         18      NaN        NaN            NaN             Albania
4   31.0         16      NaN        NaN            NaN       United States

        CurrencyDesc  …                SurveyEase         SurveyLength  \
0      European Euro  …  Neither easy nor difficult  Appropriate in length
1     Pound sterling  …                         NaN                    NaN
2                NaN  …  Neither easy nor difficult  Appropriate in length
3       Albanian lek  …                         NaN                    NaN
4                NaN  …                        Easy              Too short

   Trans                              UndergradMajor  \
0     No  Computer science, computer engineering, or sof…
1    NaN  Computer science, computer engineering, or sof…
2    NaN                                           NaN
3     No  Computer science, computer engineering, or sof…
4     No  Computer science, computer engineering, or sof…

  WebframeDesireNextYear    WebframeWorkedWith  \
0           ASP.NET Core  ASP.NET;ASP.NET Core
1                    NaN                   NaN
2                    NaN                   NaN
3                    NaN                   NaN
4    Django;Ruby on Rails         Ruby on Rails

                           WelcomeChange WorkWeekHrs YearsCode YearsCodePro
0    Just as welcome now as I felt last year        50.0        36           27
1  Somewhat more welcome now than last year         NaN         7            4
2  Somewhat more welcome now than last year         NaN         4          NaN
3  Somewhat less welcome now than last year        40.0         7            4
4    Just as welcome now as I felt last year         NaN        15            8

[5 rows x 61 columns]
```

```python
col_mapping = [f"{c[0]}:{c[1]}" for c in enumerate(so.columns)]
col_mapping
```

```
['0:Respondent',
 '1:MainBranch',
 '2:Hobbyist',
 '3:Age',
```

```
'4:Age1stCode',
'5:CompFreq',
'6:CompTotal',
'7:ConvertedComp',
'8:Country',
'9:CurrencyDesc',
'10:CurrencySymbol',
'11:DatabaseDesireNextYear',
'12:DatabaseWorkedWith',
'13:DevType',
'14:EdLevel',
'15:Employment',
'16:Ethnicity',
'17:Gender',
'18:JobFactors',
'19:JobSat',
'20:JobSeek',
'21:LanguageDesireNextYear',
'22:LanguageWorkedWith',
'23:MiscTechDesireNextYear',
'24:MiscTechWorkedWith',
'25:NEWCollabToolsDesireNextYear',
'26:NEWCollabToolsWorkedWith',
'27:NEWDevOps',
'28:NEWDevOpsImpt',
'29:NEWEdImpt',
'30:NEWJobHunt',
'31:NEWJobHuntResearch',
'32:NEWLearn',
'33:NEWOffTopic',
'34:NEWOnboardGood',
'35:NEWOtherComms',
'36:NEWOvertime',
'37:NEWPurchaseResearch',
'38:NEWPurpleLink',
'39:NEWSOSites',
'40:NEWStuck',
'41:OpSys',
'42:OrgSize',
'43:PlatformDesireNextYear',
'44:PlatformWorkedWith',
'45:PurchaseWhat',
'46:Sexuality',
'47:SOAccount',
'48:SOComm',
'49:SOPartFreq',
'50:SOVisitFreq',
```

```
'51:SurveyEase',
'52:SurveyLength',
'53:Trans',
'54:UndergradMajor',
'55:WebframeDesireNextYear',
'56:WebframeWorkedWith',
'57:WelcomeChange',
'58:WorkWeekHrs',
'59:YearsCode',
'60:YearsCodePro']
```

Index list of columns for .iloc

[ ]: `so.iloc[:,3].value_counts()`

```
[ ]: 25.0    2693
     28.0    2412
     30.0    2406
     26.0    2391
     27.0    2338
             …
     23.8       1
     95.0       1
     31.5       1
     20.5       1
     16.5       1
     Name: Age, Length: 110, dtype: int64
```

[ ]: `so.iloc[:,7].value_counts()`

```
[ ]: 120000.0     341
     100000.0     306
     150000.0     277
     2000000.0    258
     1000000.0    258
                  …
     102700.0       1
     68721.0        1
     96250.0        1
     38456.0        1
     21487.0        1
     Name: ConvertedComp, Length: 6958, dtype: int64
```

Use distplot for age/salary

[ ]: `so.iloc[:,13].value_counts()`

```
[ ]: Developer, full-stack
     4424
     Developer, back-end
     3086
     Developer, back-end;Developer, front-end;Developer, full-stack
     2227
     Developer, back-end;Developer, full-stack
     1476
     Developer, front-end
     1401
                                           …
     Data scientist or machine learning specialist;Developer, back-end;Engineering
     manager;Product manager
     1
     Designer;Developer, front-end;Developer, game or graphics;Developer,
     mobile;Educator
     1
     Academic researcher;Data or business analyst;Database
     administrator;Designer;Developer, back-end;Developer, front-end
     1
     Academic researcher;Data scientist or machine learning specialist;Database
     administrator;Designer;Developer, back-end;Developer, desktop or enterprise
     applications;Developer, front-end;Developer, full-stack;Developer, game or
     graphics;Engineer, data;Engineer, site reliability        1
     Designer;Developer, back-end;Developer, front-end;Developer, full-
     stack;Developer, mobile;Marketing or sales professional;Product manager
     1
     Name: DevType, Length: 8269, dtype: int64
```

```python
so.iloc[:,13].fillna('none', inplace=True)
so_dataengineer = so[so.iloc[:,13].str.contains('Engineer, data')]
so_dataanalyst = so[so.iloc[:,13].str.contains('Data or business analyst')]
so_datascienceML = so[so.iloc[:,13].str.contains('Data scientist or machine␣
 ↪learning specialist')]
```

```python
so_data = so[so.iloc[:,13].str.contains('data')]
```

Respondents could select multiple values for DevType answer, sorted into different careers, including overarching "data".

```python
so.iloc[:,14].value_counts()
```

```
[ ]: Bachelor's degree (B.A., B.S., B.Eng., etc.)
     26542
     Master's degree (M.A., M.S., M.Eng., MBA, etc.)
     13112
     Some college/university study without earning a degree
     7239
```

Secondary school (e.g. American high school, German Realschule or Gymnasium, etc.)   4771
Associate degree (A.A., A.S., etc.)
1843
Other doctoral degree (Ph.D., Ed.D., etc.)
1690
Primary/elementary school
941
Professional degree (JD, MD, etc.)
800
I never completed any formal education
493
Name: EdLevel, dtype: int64

[ ]: `so.iloc[:,15].value_counts()`

[ ]: Employed full-time   45270
Student   7787
Independent contractor, freelancer, or self-employed   5672
Not employed, but looking for work   2343
Employed part-time   2217
Not employed, and not looking for work   322
Retired   243
Name: Employment, dtype: int64

[ ]: `so.iloc[:,16].value_counts()`

[ ]: White or of European descent
29318
South Asian
4467
Hispanic or Latino/a/x
2256
Black or of African descent
1690
Southeast Asian
1686
                                                                              …
East Asian;Middle Eastern;White or of European descent;South Asian;Southeast
Asian   1
East Asian;Middle Eastern;White or of European descent;Biracial;Multiracial
1
Black or of African descent;East Asian;Middle Eastern;South Asian
1
Black or of African descent;East Asian;Hispanic or Latino/a/x;Indigenous (such
as Native American, Pacific Islander, or Indigenous Australian)   1
Black or of African descent;East Asian;Hispanic or Latino/a/x;Middle

```
Eastern;White or of European descent
1
Name: Ethnicity, Length: 208, dtype: int64
```

[ ]: `so.iloc[:,17].value_counts()`

```
[ ]: Man                                                        46013
     Woman                                                       3844
     Non-binary, genderqueer, or gender non-conforming            385
     Man;Non-binary, genderqueer, or gender non-conforming        121
     Woman;Non-binary, genderqueer, or gender non-conforming       92
     Woman;Man                                                     76
     Woman;Man;Non-binary, genderqueer, or gender non-conforming   26
     Name: Gender, dtype: int64
```

[ ]: `so.iloc[:,21].value_counts()`

```
[ ]: Python                                                      1152
     Rust                                                         528
     HTML/CSS;JavaScript;TypeScript                               499
     C#                                                           461
     Go                                                           412
                                                                   …
     Assembly;JavaScript;PHP;Ruby;SQL                               1
     C#;HTML/CSS;Java;JavaScript;Kotlin;PHP;Ruby;SQL;TypeScript     1
     HTML/CSS;Java;JavaScript;Python;Scala;SQL;Swift               1
     Bash/Shell/PowerShell;PHP;Scala;SQL                           1
     Assembly;C;C++;Go;Python;TypeScript                           1
     Name: LanguageDesireNextYear, Length: 16243, dtype: int64
```

Languages, gender, ethnicity all need to be separated for full counts for those who selected more than one entry.

[ ]: `so.iloc[:,42].value_counts()`

```
[ ]: 20 to 99 employees                                  9597
     100 to 499 employees                                8311
     10,000 or more employees                            6149
     1,000 to 4,999 employees                            4863
     2 to 9 employees                                    4409
     10 to 19 employees                                  4127
     500 to 999 employees                                2880
     Just me - I am a freelancer, sole proprietor, etc.  2190
     5,000 to 9,999 employees                            1808
     Name: OrgSize, dtype: int64
```

[ ]: `so_dataengineer.iloc[:,7].describe()`

```
[ ]: count    2.561000e+03
     mean     1.254542e+05
     std      2.696248e+05
     min      0.000000e+00
     25%      3.073200e+04
     50%      6.485900e+04
     75%      1.125000e+05
     max      2.000000e+06
     Name: ConvertedComp, dtype: float64
```

```
[ ]: so_dataanalyst.iloc[:,7].describe()
```

```
[ ]: count    2.596000e+03
     mean     1.172280e+05
     std      2.784516e+05
     min      0.000000e+00
     25%      2.359175e+04
     50%      5.512900e+04
     75%      9.503150e+04
     max      2.000000e+06
     Name: ConvertedComp, dtype: float64
```

```
[ ]: so_datascienceML.iloc[:,7].describe()
```

```
[ ]: count    2.619000e+03
     mean     1.239112e+05
     std      2.794602e+05
     min      0.000000e+00
     25%      2.590200e+04
     50%      5.800000e+04
     75%      1.048065e+05
     max      2.000000e+06
     Name: ConvertedComp, dtype: float64
```

```
[ ]: sns.distplot(so_dataengineer.iloc[:,7])
     sns.distplot(so_dataanalyst.iloc[:,7])
     sns.distplot(so_datascienceML.iloc[:,7])
     plt.title('Converted Yearly Compensation (Salary) for Data Careers (Stack␣
      ↪Overflow)')
     plt.xlim(0,300000)
     plt.legend(['Data Engineer', 'Data Analyst', 'Data Scientist'])
```

```
[ ]: <matplotlib.legend.Legend at 0x1e71709ba88>
```

Converted Yearly Compensation (Salary) for Data Careers (Stack Overflow)
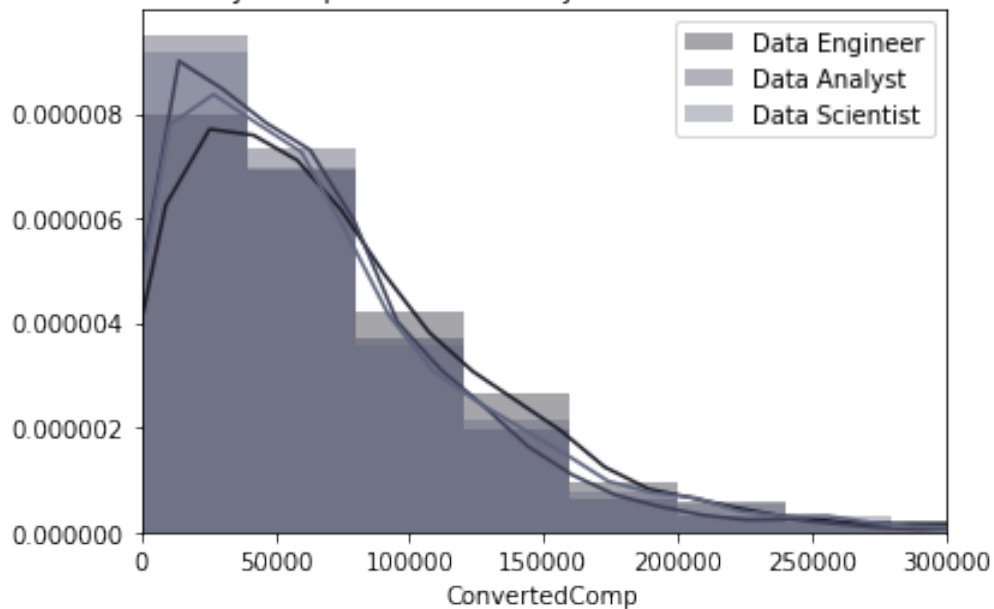
Descriptions for salaries (median, mean) not too different from each other. Zoomed graph to focus on relevant area. Mean income is around 120000. Median is around 55000, 56000 for scientists.

```
plt.hist([so_dataengineer.iloc[:,7], so_dataanalyst.iloc[:,7], so_datascienceML.
 ↪iloc[:,7]], bins=200)
plt.xlim(0,200000)
plt.legend(('Data Engineer', 'Data Analyst', 'Data Scientist/Machine Learning'))
plt.title('Zoomed view of compared data career income (Stack Overflow)')
```

```
Text(0.5, 1.0, 'Zoomed view of compared data career income (Stack Overflow)')
```

Zoomed view of compared data career income (Stack Overflow)
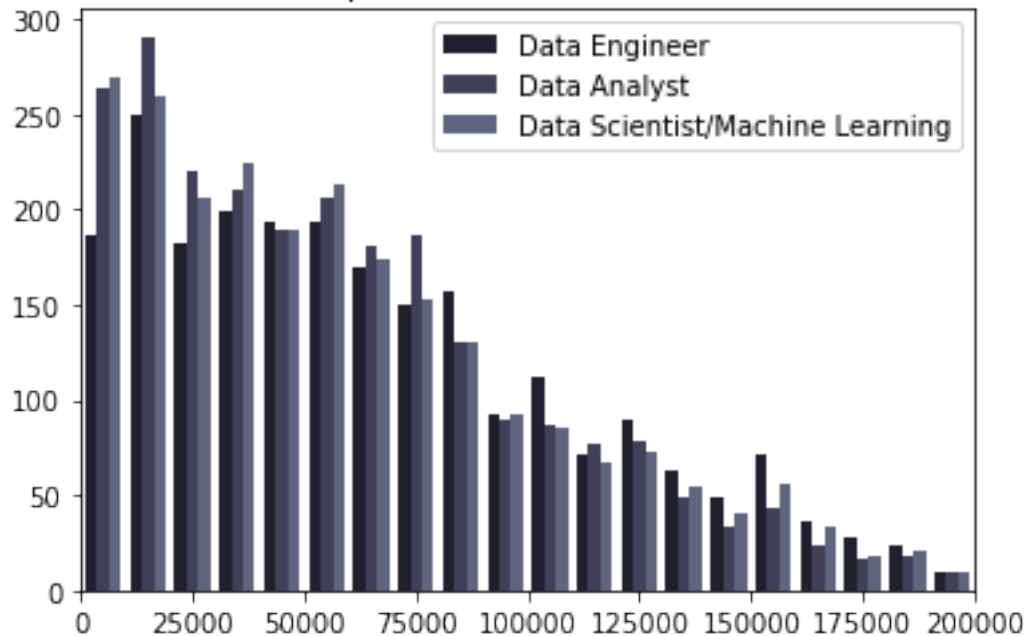
Comparison view to confirm no real difference.

```
so_dataengineer.iloc[:,7].describe()
```

```
count    2.561000e+03
mean     1.254542e+05
std      2.696248e+05
min      0.000000e+00
25%      3.073200e+04
50%      6.485900e+04
75%      1.125000e+05
max      2.000000e+06
Name: ConvertedComp, dtype: float64
```

```
so_dataanalyst.iloc[:,7].describe()
```

```
count    2.596000e+03
mean     1.172280e+05
std      2.784516e+05
min      0.000000e+00
25%      2.359175e+04
50%      5.512900e+04
75%      9.503150e+04
max      2.000000e+06
Name: ConvertedComp, dtype: float64
```

```
[ ]: so_datascienceML.iloc[:,7].describe()
```

```
[ ]: count    2.619000e+03
     mean     1.239112e+05
     std      2.794602e+05
     min      0.000000e+00
     25%      2.590200e+04
     50%      5.800000e+04
     75%      1.048065e+05
     max      2.000000e+06
     Name: ConvertedComp, dtype: float64
```

```
[ ]: from scipy.stats import f_oneway
     f_oneway(so_dataengineer.iloc[:,7].dropna(), so_dataanalyst.iloc[:,7].dropna(),
      ↪so_datascienceML.iloc[:,7].dropna())
```

```
[ ]: F_onewayResult(statistic=0.6499468851958894, pvalue=0.5221018760335133)
```

We can see that most data careers earn between 0 and \$250,000 per year. There is not a significant difference between which speciality earns more, according to this data. This is backed up by an ANOVA one-way test that results in an f-value close to 0.

```
[ ]: so_dataengineer.iloc[:,14].value_counts()
```

```
[ ]: Bachelor's degree (B.A., B.S., B.Eng., etc.)
     1594
     Master's degree (M.A., M.S., M.Eng., MBA, etc.)
     1285
     Some college/university study without earning a degree
     320
     Other doctoral degree (Ph.D., Ed.D., etc.)
     155
     Secondary school (e.g. American high school, German Realschule or Gymnasium,
     etc.)      115
     Associate degree (A.A., A.S., etc.)
     85
     Professional degree (JD, MD, etc.)
     58
     Primary/elementary school
     36
     I never completed any formal education
     28
     Name: EdLevel, dtype: int64
```

```
[ ]: hcountplot(so_dataengineer.iloc[:,14])
     plt.title('Education of Data Engineers (Stack Overflow)')
```

```
[ ]: Text(0.5, 1.0, 'Education of Data Engineers (Stack Overflow)')
```

Education of Data Engineers (Stack Overflow)
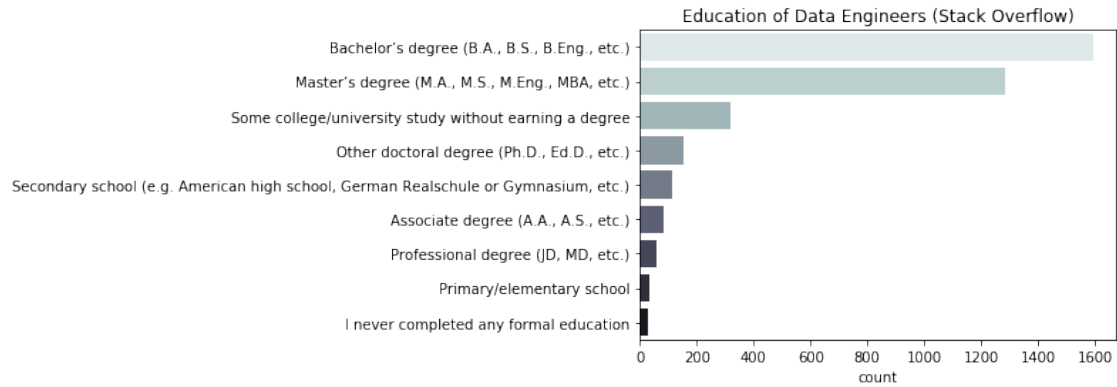
```
hcountplot(so_dataanalyst.iloc[:,14])
plt.title('Education of Data Analysts (Stack Overflow)')
```

Text(0.5, 1.0, 'Education of Data Analysts (Stack Overflow)')

Education of Data Analysts (Stack Overflow)
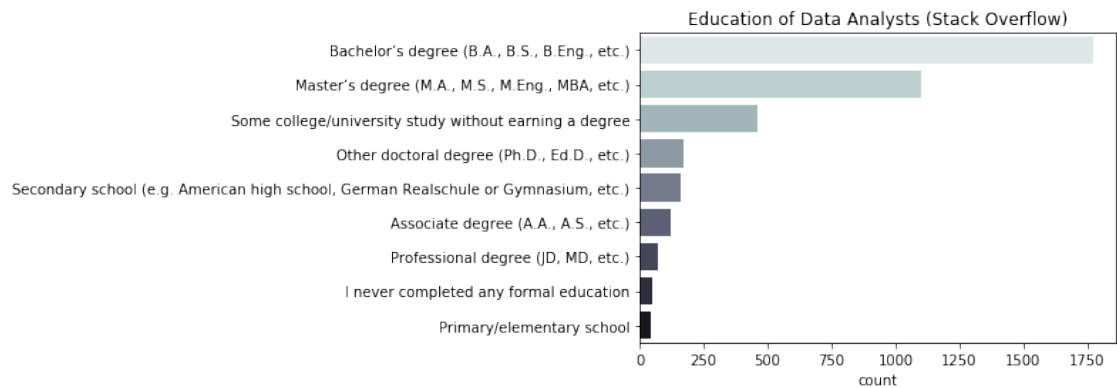
```
hcountplot(so_datascienceML.iloc[:,14])
plt.title('Education of Data Scientists (Stack Overflow)')
```

Text(0.5, 1.0, 'Education of Data Scientists (Stack Overflow)')

37

Education of Data Scientists (Stack Overflow)
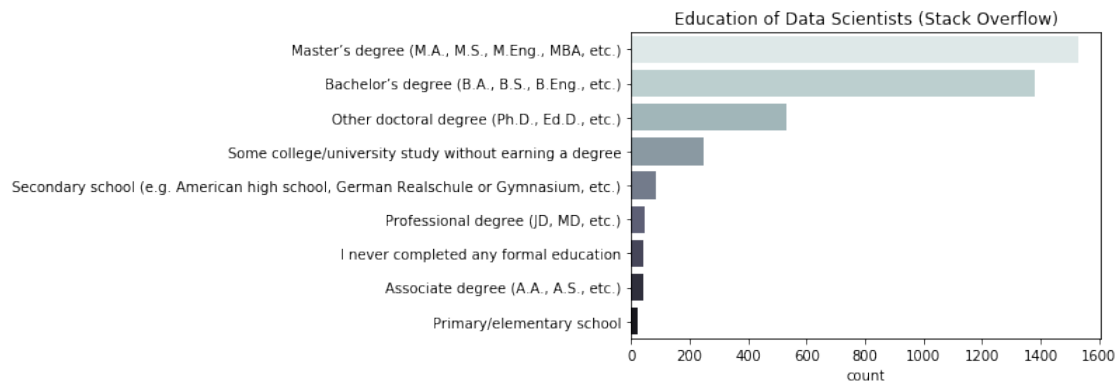
Stack Overflow shows that data scientists tend to have masters degrees over the standard bachelor's degree, and doctoral degrees rank higher.

```
[ ]: hcountplot(so_data.iloc[:,14])
     plt.title('Education of Data Careers (Stack Overflow)')
```

```
[ ]: Text(0.5, 1.0, 'Education of Data Careers (Stack Overflow)')
```


Education of Data Careers (Stack Overflow)
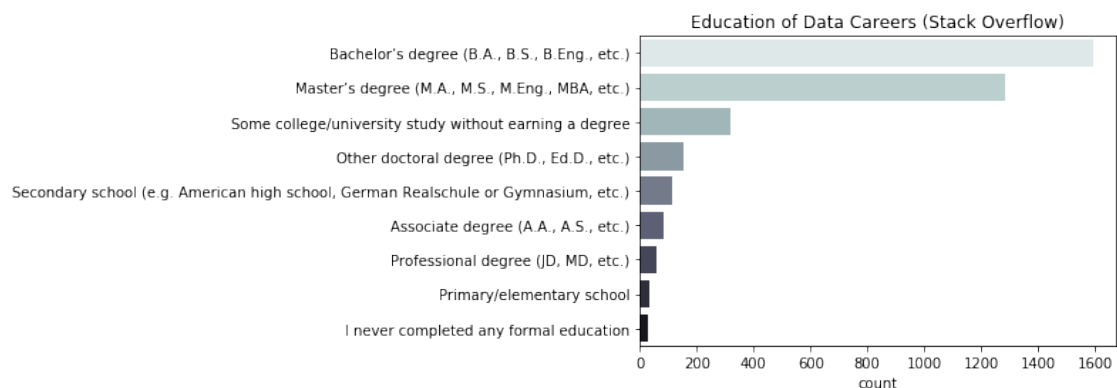
All data fields have similar eductional backgrounds, with primarily Bachelors or Masters degrees.

```
[ ]: so_dataanalyst.iloc[:,22].value_counts()
```

```
[ ]: Python;SQL                                         86
     C#;HTML/CSS;JavaScript;SQL                         66
     Python;R;SQL                                       59
     Python                                             53
     HTML/CSS;JavaScript;PHP;SQL                        46
                                                        ..
     C++;Java;JavaScript;Kotlin;PHP;Python;SQL;TypeScript  1
     HTML/CSS;JavaScript;Python;Scala;SQL               1
```

```
HTML/CSS;Java;Python;R;SQL;Swift;VBA                    1
C#;Java;JavaScript;SQL;VBA                              1
C++;Python;R;SQL;VBA                                    1
Name: LanguageWorkedWith, Length: 1830, dtype: int64
```

[ ]: `so_dataanalyst.iloc[:,22].unique()`

[ ]:
```
array(['Bash/Shell/PowerShell;C#;HTML/CSS;JavaScript;Python;SQL;TypeScript',
       'C#;Go;HTML/CSS;Java;JavaScript;Python;R;SQL',
       'HTML/CSS;Python;R;SQL;VBA', …,
       'C;HTML/CSS;Java;JavaScript;Python;R;SQL;VBA',
       'Bash/Shell/PowerShell;C;C#;C++;HTML/CSS;Java;JavaScript;Objective-C;Pyth
on;Swift',
       'C++;HTML/CSS'], dtype=object)
```

[ ]:
```
so_dataanalystlang = so_dataanalyst.iloc[:,22].str.split(';').apply(pd.Series).
 ↪stack().reset_index(drop=True)
so_dataanalystlang
```

[ ]:
```
0          Bash/Shell/PowerShell
1                            C#
2                      HTML/CSS
3                    JavaScript
4                        Python
                  …
20478                Objective-C
20479                    Python
20480                     Swift
20481                       C++
20482                  HTML/CSS
Length: 20483, dtype: object
```

Individual answers separated for counting, repeated later.

[ ]:
```
hcountplotlimit(so_dataanalystlang, 10)
plt.title('Use of Coding Languages by Data Analysts (Stack Overflow)')
```

[ ]: `Text(0.5, 1.0, 'Use of Coding Languages by Data Analysts (Stack Overflow)')`

Use of Coding Languages by Data Analysts (Stack Overflow)
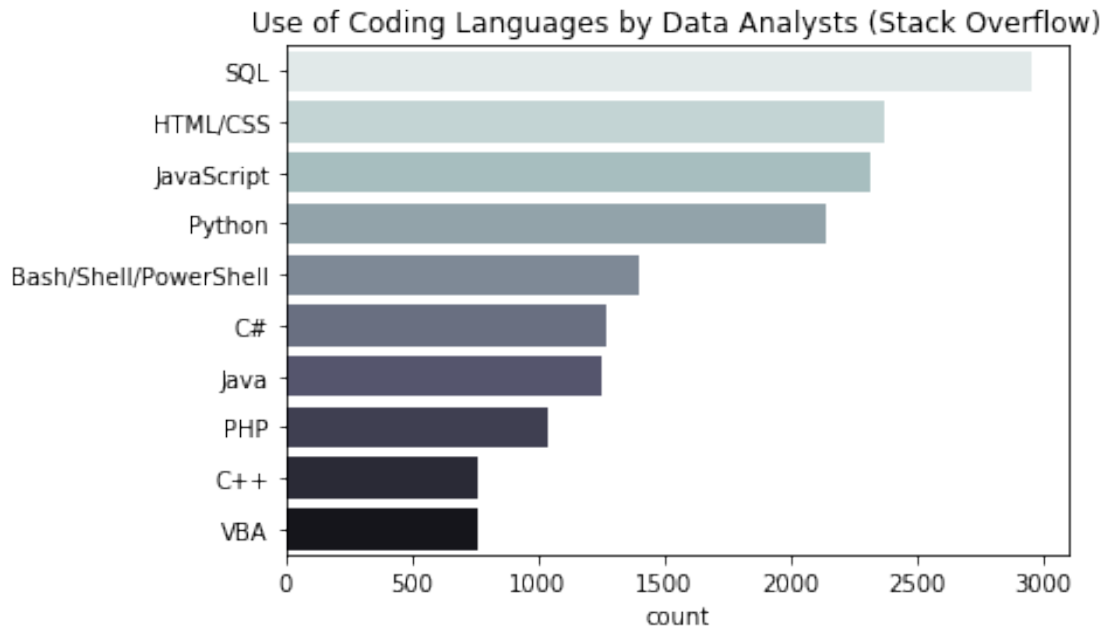
```
[ ]: so_dataengineerlang = so_dataengineer.iloc[:,22].str.split(';').apply(pd.
     ↪Series).stack().reset_index(drop=True)
     so_dataengineerlang
```

```
[ ]: 0                          Java
     1                        Python
     2           Bash/Shell/PowerShell
     3                             C
     4           Bash/Shell/PowerShell
                       …
     20224                     Scala
     20225                       SQL
     20226                     Swift
     20227                  TypeScript
     20228                       VBA
     Length: 20229, dtype: object
```

```
[ ]: hcountplotlimit(so_dataengineerlang, 10)
     plt.title('Use of Coding Languages by Data Engineers (Stack Overflow)')
```

```
[ ]: Text(0.5, 1.0, 'Use of Coding Languages by Data Engineers (Stack Overflow)')
```

Use of Coding Languages by Data Engineers (Stack Overflow)
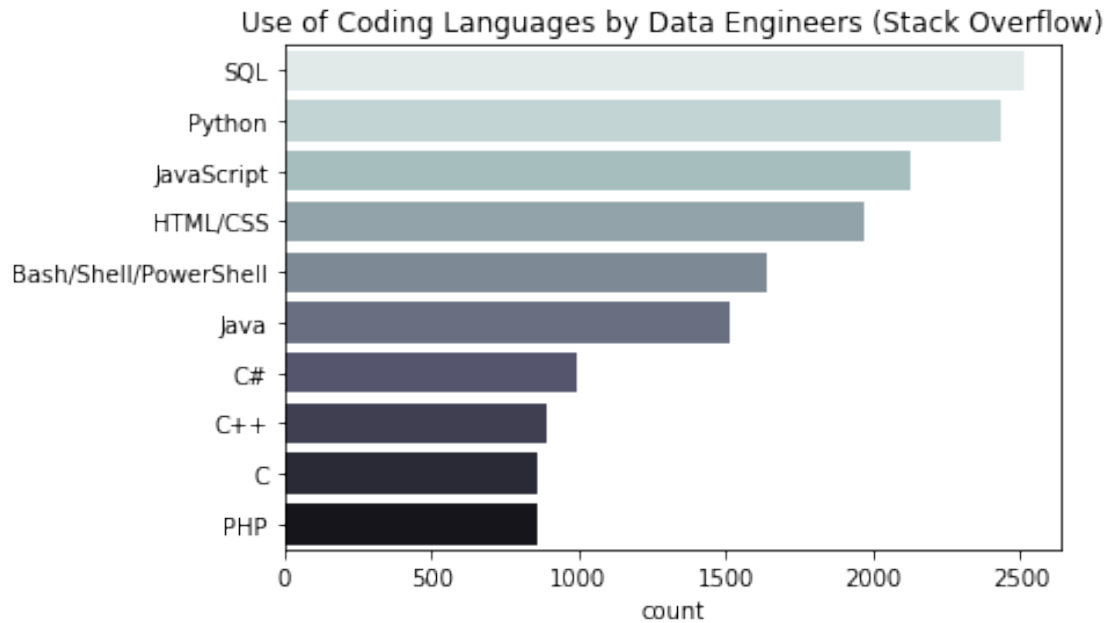
```
[ ]: so_datascienceMLlang = so_datascienceML.iloc[:,22].str.split(';').apply(pd.
     ↪Series).stack().reset_index(drop=True)
     so_datascienceMLlang
```

```
[ ]: 0                    C#
     1                    Go
     2              HTML/CSS
     3                  Java
     4            JavaScript
                    …
     20782              Java
     20783        JavaScript
     20784       Objective-C
     20785            Python
     20786             Swift
     Length: 20787, dtype: object
```

```
[ ]: hcountplotlimit(so_datascienceMLlang, 10)
     plt.title('Use of Coding Languages by Data Scientists (Stack Overflow)')
```

```
[ ]: Text(0.5, 1.0, 'Use of Coding Languages by Data Scientists (Stack Overflow)')
```

Use of Coding Languages by Data Scientists (Stack Overflow)
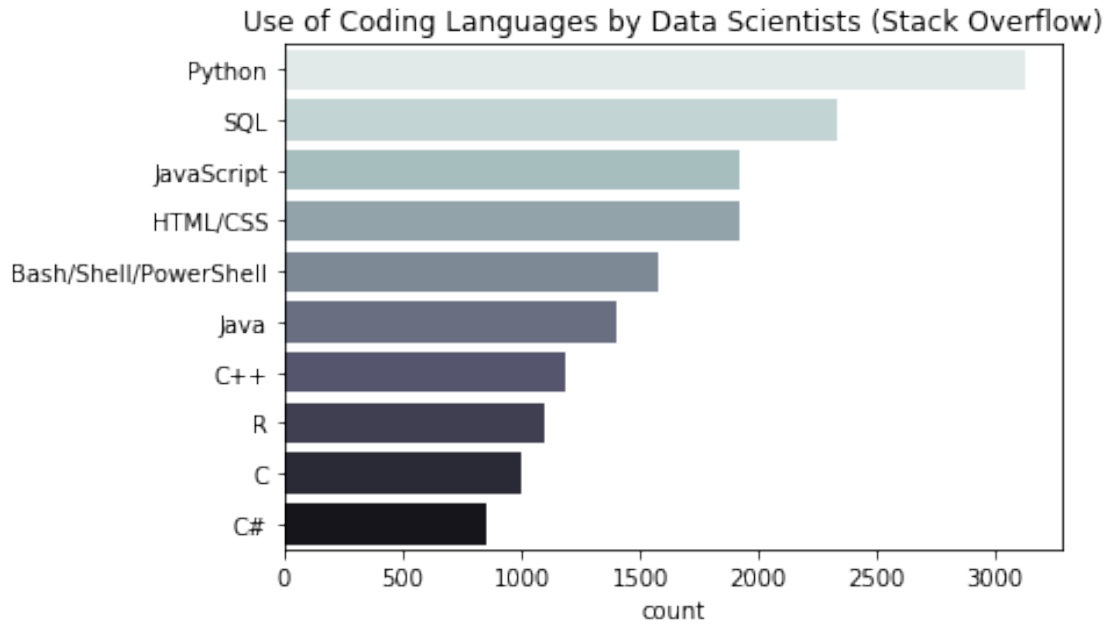
```
so_datalang = so_data.iloc[:,22].str.split(';').apply(pd.Series).stack().
    ↪reset_index(drop=True)
so_datalang
```

```
0                          Java
1                        Python
2          Bash/Shell/PowerShell
3                             C
4          Bash/Shell/PowerShell
                  ...
20224                     Scala
20225                       SQL
20226                     Swift
20227                TypeScript
20228                       VBA
Length: 20229, dtype: object
```

```
hcountplotlimit(so_datalang, 10)
plt.title('Use of Coding Languages by Data Careers (Stack Overflow)')
```

```
Text(0.5, 1.0, 'Use of Coding Languages by Data Careers (Stack Overflow)')
```

Use of Coding Languages by Data Careers (Stack Overflow)
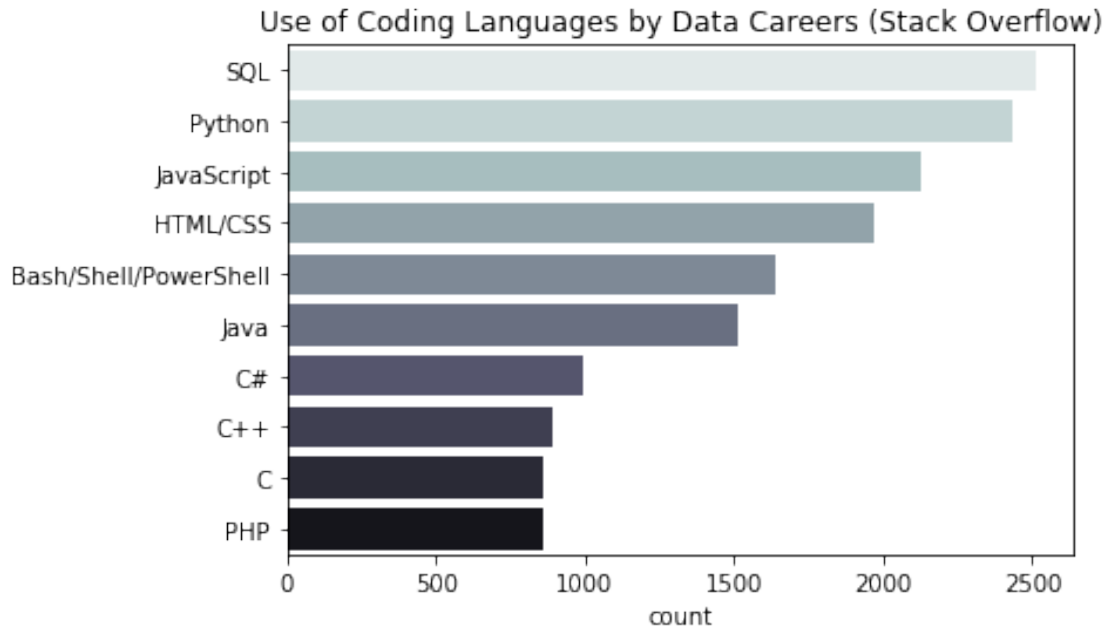
SQL and Python are the most popular languages for engineers and scientists. HTML/CSS are also popular with analysts.

```
[ ]: so_data.iloc[:,42].unique()
```

```
[ ]: array(['500 to 999 employees', '100 to 499 employees',
            '10 to 19 employees', '20 to 99 employees', nan,
            '10,000 or more employees', '5,000 to 9,999 employees',
            '2 to 9 employees', '1,000 to 4,999 employees',
            'Just me - I am a freelancer, sole proprietor, etc.'], dtype=object)
```

```
[ ]: orgsizeorder = ['Just me - I am a freelancer, sole proprietor, etc.', '2 to 9␣
     ↪employees', '10 to 19 employees', '20 to 99 employees', '100 to 499␣
     ↪employees', '500 to 999 employees', '1,000 to 4,999 employees', '5,000 to␣
     ↪9,999 employees', '10,000 or more employees']
     ax = sns.countplot(y=so_data.iloc[:,42], order=orgsizeorder, palette="bone_r")
     plt.title('Size of Organization for Data Careers (Stack Overflow)')
     ax.set(xlabel='count', ylabel='')
```

```
[ ]: [Text(0, 0.5, ''), Text(0.5, 0, 'count')]
```

Size of Organization for Data Careers (Stack Overflow)
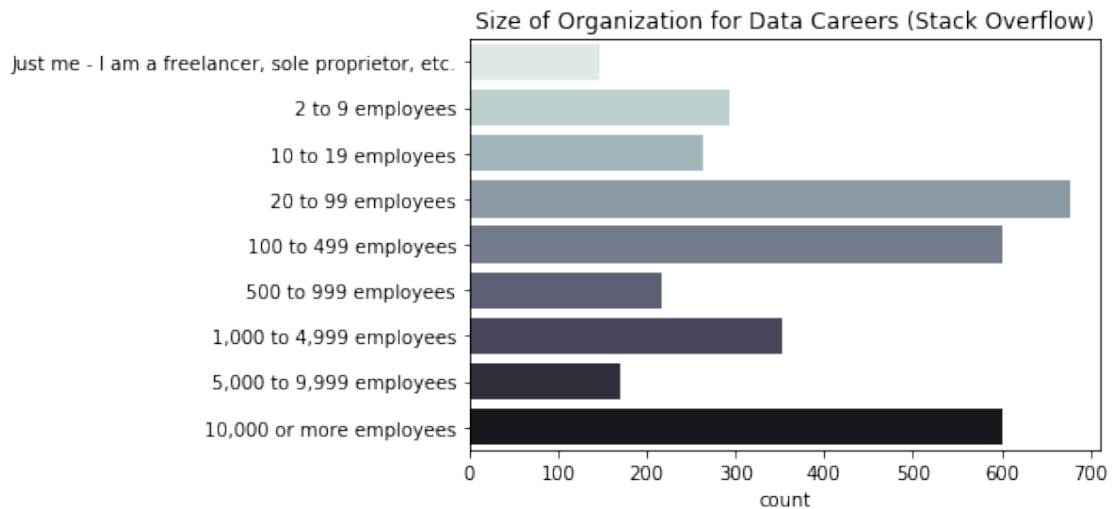
Arranged org size values in logical order

```
[ ]: hcountplot(so_data.iloc[:,42])
     plt.title('Size of Organization for Data Careers (Stack Overflow)')
```

```
[ ]: Text(0.5, 1.0, 'Size of Organization for Data Careers (Stack Overflow)')
```
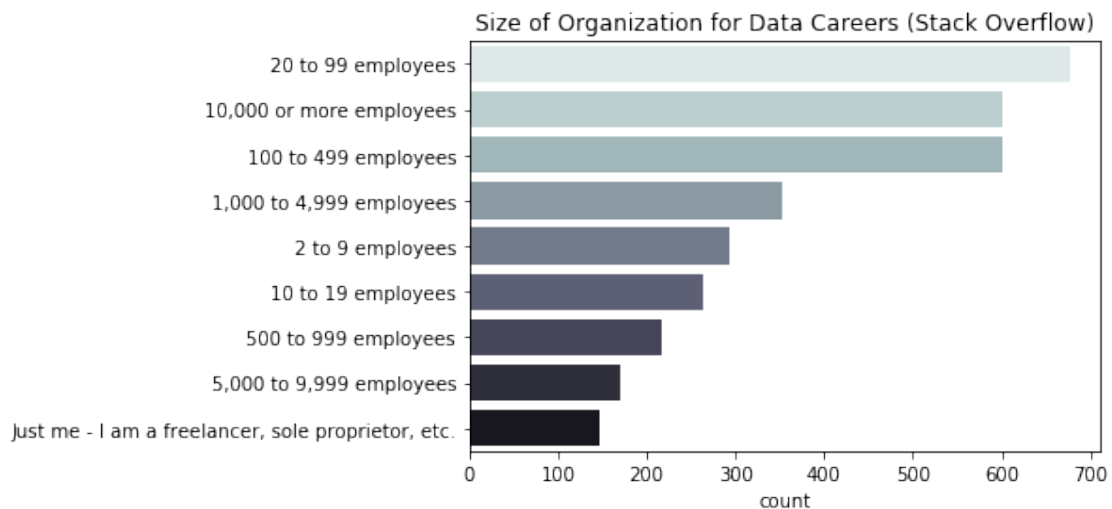


```
[ ]: plt.figure(figsize=(15,10))
     ax = sns.countplot(x=so_data.iloc[:,3].sort_values(ascending=True).dropna().
       ↪astype('int'), palette="bone_r")
     plt.title('Age Distribution in Data Careers (Stack Overflow)')
```

[ ]: Text(0.5, 1.0, 'Age Distribution in Data Careers (Stack Overflow)')

Age Distribution in Data Careers (Stack Overflow)
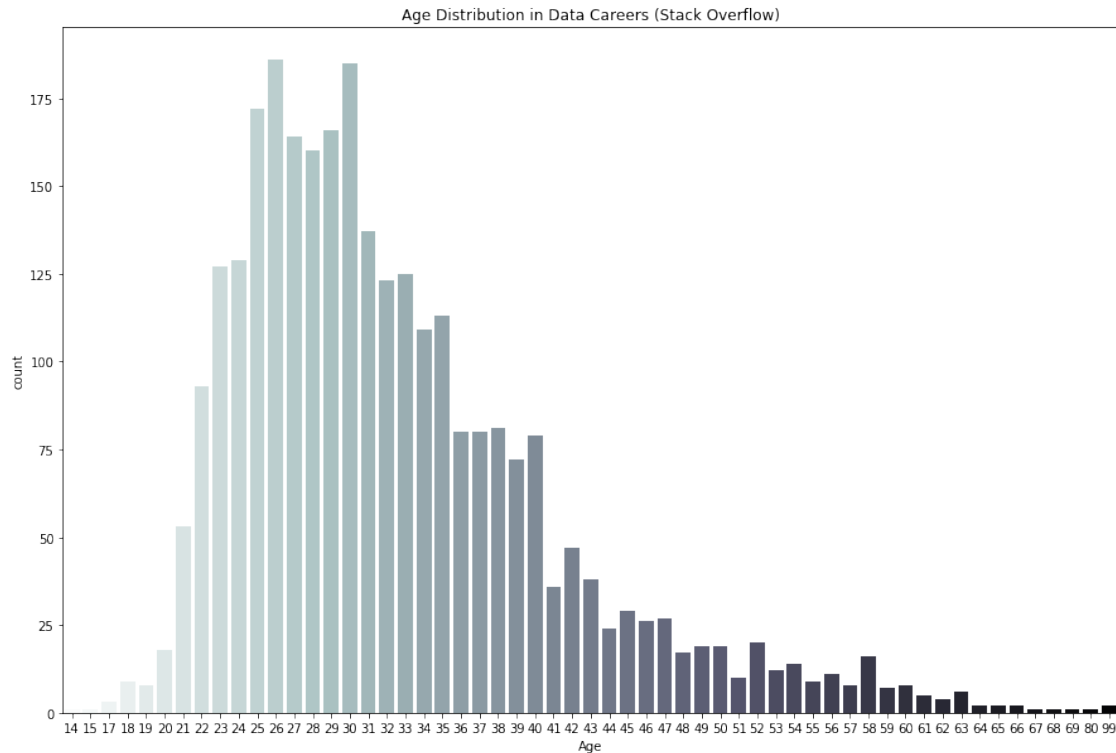
```
[ ]: plt.figure(figsize=(5,2))
     ax = sns.boxplot(x=so_data.iloc[:,3], palette="bone_r")
     plt.title('Age Distribution in Data Careers (Stack Overflow)')
```

[ ]: Text(0.5, 1.0, 'Age Distribution in Data Careers (Stack Overflow)')

Age Distribution in Data Careers (Stack Overflow)
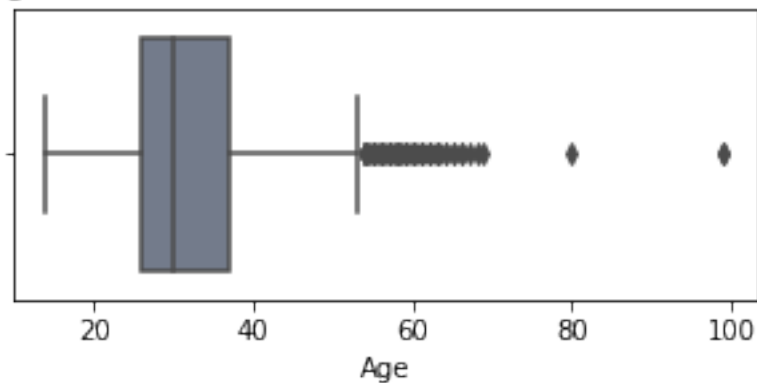
```
[ ]: so_data.iloc[:,3].describe()
```

```
[ ]: count    2898.000000
     mean       32.413043
     std         8.837477
     min        14.000000
     25%        26.000000
     50%        30.000000
     75%        37.000000
     max        99.000000
     Name: Age, dtype: float64
```

Mean age is 32, a little higher than NC. Median is 30, which is also a little higher. This tracks with the idea that the respondents to SO would be a little older and more established in the industry.

```
[ ]: so_dataengineer.iloc[:,17].str.split(';').apply(pd.Series).stack().
     ↪reset_index(drop=True).value_counts()
```

```
[ ]: Man                                            3017
     Woman                                           207
     Non-binary, genderqueer, or gender non-conforming   43
     dtype: int64
```

```
[ ]: ax = sns.countplot(y=so_data.iloc[:,17].str.split(';').apply(pd.Series).stack().
     ↪reset_index(drop=True), palette="bone_r")
     plt.title('Gender Distribution in Data Careers (Stack Overflow)')
```

```
[ ]: Text(0.5, 1.0, 'Gender Distribution in Data Careers (Stack Overflow)')
```
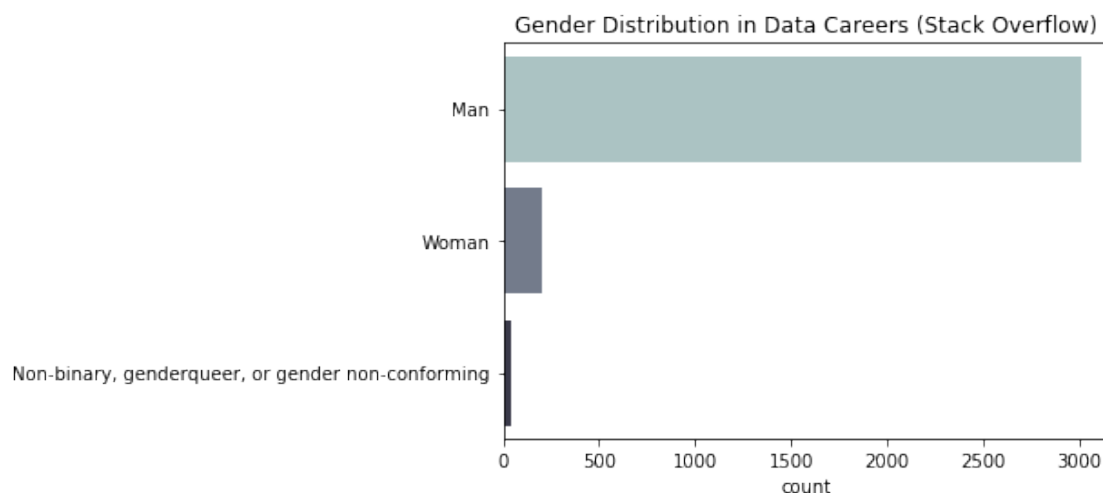

No significant differences between careers. Men are the overwhelming majority.

```
hcountplot(so_data.iloc[:,16].str.split(';').apply(pd.Series).stack().
 ↪reset_index(drop=True))
plt.title('Ethnicities represented in data careers (Stack Overflow)')
```

[ ]: Text(0.5, 1.0, 'Ethnicities represented in data careers (Stack Overflow)')
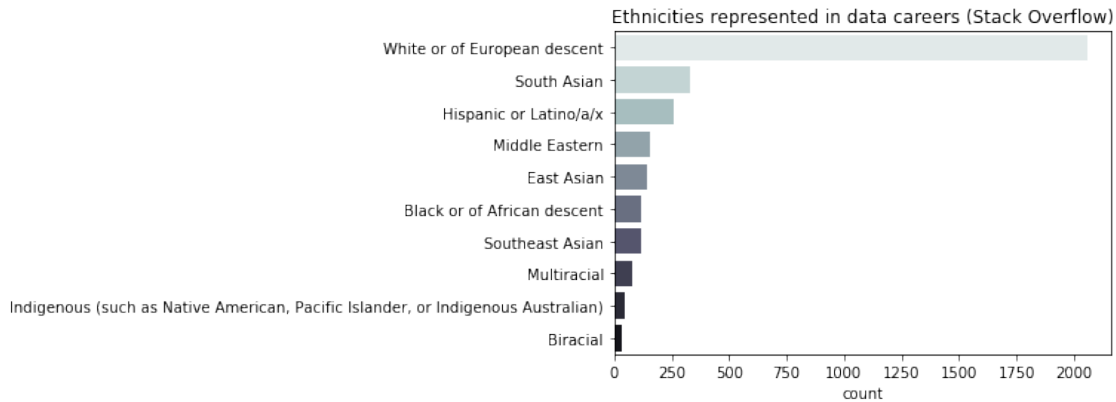
White is the majority ethnicity in data careers. Among the minorities, there is not a significant difference between them.

Stack Overflow gives us a very good look at the languages, salaries, and education of those actively working in the career. Stack Overflow is used by people all throughout IT to troubleshoot and discuss issues. We can see that the hopeful salaries from New Coders seems reasonable based on what we see in SO. We also get a good look at the different programming languages used.

3 JetBrains

```
jb = pd.read_csv('datasets/jetbrains.csv')
jb.head()
```

```
C:\Users\ktlea\anaconda3\lib\site-
packages\IPython\core\interactiveshell.py:3063: DtypeWarning: Columns (8,14,15,2
2,52,61,66,78,81,82,84,85,86,87,88,96,97,122,123,144,149,151,152,153,154,157,158
,159,160,162,163,164,165,167,168,177,181,185,188,191,194,196,197,198,200,201,202
,203,204,205,206,267,268,272,273,280,285,287,288,292,301,302,307,308,309,311,312
,313,314,315,316,317,318,319,321,324,325,326,328,330,331,332,333,334,335,336,338
,339,340,341,383,389,390,395,398,402,408,409,410,411,414,415,417,418,421,428,435
,441,448,451,452,462,466,468,470,471,474,475,476,482,493,497,500,503,508,509,510
,511,518,533,541,543,568,569,572,573,574,582,583,588,590,595,597,598,600,604,605
,608,609,610,611,612,613,614,615,616,617,618,619,622,623,624,626,627,628,629,631
,634,635,636,637,638,639,645,646,647,653,654,655,657,658,659,660,661,662,664,666
,667,668,669,671,672,673,675,677,678,680,681,685,686,687,688,689,694,695,700,701
,702,703,704,705,706,707,709,713,714,715,717,718,719,721,722,727,742,744,747,748
,749,752,753,755,766,769,787,789,796,797,798,799,801,802,803,804,809,813,814,826
```

```
,831,833,834,838,839,841,842,843,844,845,846,847,848,849,857,859,860,861,862,866
,867,878,879,880,881,886,895,896,897,898,901,902,903,904,905,907,908,911,915,916
,917,918,919,925,926,927,933,934,935,942,945,946,947,948,950,951,953,954,961,962
,963,964,965,966,967,968,969,971,973,974,975,976,977,978,981,983,984,985,987,988
,989,991,992,993,996,997,998,1002,1004,1005,1007,1008,1009,1010,1011,1012,1013,1
014,1016,1017,1018,1019,1020,1021,1022,1023,1026,1027,1029,1030,1031,1032,1037,1
040,1044,1045,1046,1047,1048,1049,1051,1052,1057,1058,1059,1060,1061,1066,1067,1
069,1073,1074,1078,1080,1081,1082,1083,1084,1087,1091,1092,1094,1095,1097,1098,1
099,1100,1102,1103,1104,1105,1110,1111,1112,1113,1115,1116,1117,1118,1119,1120,1
121,1123,1125,1126,1127,1128,1129,1131,1132,1133,1139,1140,1146,1147,1148,1151,1
152,1153,1154,1158,1159,1161,1162,1163,1164,1165,1167,1168,1169,1171,1172,1174,1
175,1176,1177,1180,1181,1182,1183,1184,1185,1186,1187,1188,1189,1190,1191,1192,1
194,1195,1196,1197,1198,1199,1200,1201,1202,1203,1207,1209,1211,1212,1213,1214,1
215,1216,1218,1219,1220,1221,1223,1224,1225,1226,1227,1228,1230,1239,1240,1252,1
257,1260,1266,1268,1277,1280,1283,1286,1287,1289,1291,1292,1293,1294,1295,1297,1
299,1301,1304,1305,1308,1312,1313,1314,1315,1316,1317,1318,1319,1320,1321,1322,1
323,1324,1325,1326,1327,1328,1330,1331,1333,1335,1336,1338,1339,1340,1341,1343,1
344,1345,1346,1347,1348,1349,1350,1351,1352,1355,1356,1357,1358,1359,1377,1379,1
384,1386,1391,1392,1393,1394,1395,1397,1400,1401,1402,1403,1414,1415,1420,1433,1
434,1435,1439,1440,1442,1443,1446,1447,1448,1449,1451,1453,1454,1455,1456,1457,1
459,1461,1462,1463,1464,1467,1469,1470,1471,1472,1473,1474,1475,1481,1482,1496,1
497,1501,1502,1503,1507,1512,1514,1516,1526,1528,1530,1534,1542,1546,1551,1552,1
553,1554,1562,1563,1564,1565,1578,1587,1591,1592,1593,1595,1602,1609,1616,1634,1
669,1680,1681,1682,1683,1685,1686,1688,1689,1690,1694,1696,1698,1700,1702,1735)
have mixed types.Specify dtype option on import or set low_memory=False.
  interactivity=interactivity, compiler=compiler, result=result)

[ ]:                          employment_status  \
    0  Fully employed by a company / organization
    1  Fully employed by a company / organization
    2  Fully employed by a company / organization
    3  Fully employed by a company / organization
    4  Fully employed by a company / organization

      job_role.Developer / Programmer /  Software Engineer  \
    0       Developer / Programmer /  Software Engineer
    1                                               NaN
    2       Developer / Programmer /  Software Engineer
    3                                               NaN
    4       Developer / Programmer /  Software Engineer

      job_role.DevOps Engineer / Infrastructure Developer / etc_ job_role.DBA  \
    0                                               NaN                    NaN
    1                                               NaN                    NaN
    2                                               NaN                    NaN
    3                                               NaN                    NaN
    4                                               NaN                    NaN
```

```
       job_role.Architect job_role.Tester / QA Engineer job_role.Technical support  \
0                  NaN                           NaN                             NaN
1                  NaN                           NaN                             NaN
2                  NaN                           NaN                             NaN
3                  NaN                           NaN                             NaN
4                  NaN                           NaN                             NaN


       job_role.Data analyst / Data engineer/ Data scientist  \
0                                                    NaN
1            Data analyst / Data engineer/ Data scientist
2                                                    NaN
3                                                    NaN
4                                                    NaN


       job_role.Business analyst job_role.Team Lead  …                    salary  \
0                            NaN             NaN      …                       NaN
1                            NaN             NaN      …   Don't want to disclose
2                            NaN             NaN      …   Don't want to disclose
3                            NaN       Team Lead      …         35,001 - 40,000
4                            NaN             NaN      …         30,001 - 35,000


       age_range.17 or younger age_range.18-20 age_range.21-29 age_range.30-39  \
0                          NaN             NaN             NaN             NaN
1                          NaN             NaN             NaN           30-39
2                          NaN             NaN           21-29             NaN
3                          NaN             NaN             NaN           30-39
4                          NaN             NaN             NaN             NaN


       age_range.40-49 age_range.50-59 age_range.60 or older        country  \
0                40-49             NaN                  NaN          Canada
1                  NaN             NaN                  NaN          Poland
2                  NaN             NaN                  NaN   United States
3                  NaN             NaN                  NaN   United States
4                40-49             NaN                  NaN  United Kingdom


        channel
0  Internal
1  Internal
2  Internal
3  Internal
4  Internal

[5 rows x 1738 columns]
```

```python
col_mapping = [f"{c[0]}:{c[1]}" for c in enumerate(jb.columns)]
col_mapping
```

```
[ ]: ['0:employment_status',
      '1:job_role.Developer / Programmer /  Software Engineer',
      '2:job_role.DevOps Engineer / Infrastructure Developer / etc_',
      '3:job_role.DBA',
      '4:job_role.Architect',
      '5:job_role.Tester / QA Engineer',
      '6:job_role.Technical support',
      '7:job_role.Data analyst / Data engineer/ Data scientist',
      '8:job_role.Business analyst',
      '9:job_role.Team Lead',
      '10:job_role.Systems analyst',
      '11:job_role.Product Manager',
      '12:job_role.UX / UI Designer',
      '13:job_role.CIO / CEO / CTO',
      '14:job_role.Marketing Manager',
      '15:job_role.Developer Advocate',
      '16:job_role.Instructor / Teacher / Tutor / etc_',
      '17:job_role.Other',
      '18:position_level',
      '19:os_devenv.Windows',
      '20:os_devenv.Unix / Linux',
      '21:os_devenv.macOS',
      '22:os_devenv.Other',
      "23:app_type_money.I don't develop anything for money",
      '24:app_type_money.Web Back-end',
      '25:app_type_money.Web Front-end',
      '26:app_type_money.Mobile applications',
      '27:app_type_money.Desktop',
      '28:app_type_money.Data analysis',
      '29:app_type_money.BI',
      '30:app_type_money.Machine learning',
      '31:app_type_money.Libraries / Frameworks',
      '32:app_type_money.Embedded / IoT',
      '33:app_type_money.Games',
      '34:app_type_money.Other Back-end',
      '35:app_type_money.Other',
      "36:app_type_hobby.I don't develop anything for free / only as a hobby",
      '37:app_type_hobby.Web Back-end',
      '38:app_type_hobby.Web Front-end',
      '39:app_type_hobby.Mobile applications',
      '40:app_type_hobby.Desktop',
      '41:app_type_hobby.Data analysis',
      '42:app_type_hobby.BI',
      '43:app_type_hobby.Machine learning',
      '44:app_type_hobby.Embedded / IoT',
      '45:app_type_hobby.Games',
      '46:app_type_hobby.Libraries / Frameworks',
```

```
'47:app_type_hobby.Other Back-end',
'48:app_type_hobby.Other',
'49:dev_for_desk_os.Windows',
'50:dev_for_desk_os.Unix / Linux',
'51:dev_for_desk_os.macOS',
'52:dev_for_desk_os.Other',
'53:do_crossplatform',
'54:crossplatform_platform.Windows',
'55:crossplatform_platform.Unix/Linux',
'56:crossplatform_platform.macOS',
'57:crossplatform_platform.iOS',
'58:crossplatform_platform.Android',
'59:crossplatform_platform.Web',
'60:crossplatform_platform.Embedded',
'61:crossplatform_platform.Other',
'62:crossplatform_how_os.Using containers (e_g_ Docker, Vagrant)',
'63:crossplatform_how_os.Using VMs (e_g_ VirtualBox, vSphere)',
'64:crossplatform_how_os.Using physical machines/devices',
'65:crossplatform_how_os.I don't normally work with different OSes/platforms',
'66:crossplatform_how_os.Other',
'67:crossplatform_how_fs.Using OS file browser (e_g_ File Explorer, Files,
Finder)',
'68:crossplatform_how_fs.Using the IDE',
'69:crossplatform_how_fs.Using terminal (e_g_ cd, dir/ls, copy, mv)',
'70:crossplatform_how_fs.Using third-party GUI file managers (e_g_ muCommander,
Path Finder, Total Commander)',
'71:crossplatform_how_fs.Using third-party terminal-based file managers (e_g_
Midnight Commander, Far Manager)',
'72:remote_files_operations.Browse files',
'73:remote_files_operations.Copy/move/delete files',
'74:remote_files_operations.Edit files',
'75:remote_files_operations.I don't normally work with remote files',
'76:dev_for_mobile_os.Android',
'77:dev_for_mobile_os.iOS',
'78:dev_for_mobile_os.Other',
'79:mobile_os_how.I use native tools (Swift / Objective-C for iOS, Kotlin /
Android, etc)',
'80:mobile_os_how.I use cross-platform technologies / frameworks (Xamarin,
Apache Cordova, Ionic, etc)',
'81:crossplatform_framework.Apache Flex',
'82:crossplatform_framework.Corona',
'83:crossplatform_framework.Ionic',
'84:crossplatform_framework.Kivy',
'85:crossplatform_framework.Sencha',
'86:crossplatform_framework.Dojo',
'87:crossplatform_framework.Titanium',
'88:crossplatform_framework.Kendo UI',
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'89:crossplatform_framework.Xamarin',
'90:crossplatform_framework.Cordova',
'91:crossplatform_framework.Unity',
'92:crossplatform_framework.React Native',
'93:crossplatform_framework.Flutter',
'94:crossplatform_framework.PhoneGap',
'95:crossplatform_framework.NativeScript',
'96:crossplatform_framework.Other',
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'101:proglang.Python',
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'103:proglang.PHP',
'104:proglang.JavaScript',
'105:proglang.Ruby',
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'107:proglang.Crystal',
'108:proglang.Kotlin',
'109:proglang.Swift',
'110:proglang.Objective-C',
'111:proglang.Visual Basic',
'112:proglang.Scala',
'113:proglang.Go',
'114:proglang.HTML / CSS',
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'118:proglang.TypeScript',
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'120:proglang.CoffeeScript',
'121:proglang.Clojure / ClojureScript',
'122:proglang.Delphi',
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'124:proglang.Groovy',
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'158:primary_proglang.Clojure / ClojureScript',
'159:primary_proglang.Delphi',
'160:primary_proglang.Cobol',
'161:primary_proglang.Groovy',
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'174:adopt_proglang.C++',
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'224:proglang_rank.HTML / CSS',
'225:proglang_rank.Elixir',
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'258:db.Cassandra',
'259:db.Couchbase',
'260:db.HBase',
'261:db.MongoDB',
'262:db.Neo4j',
'263:db.Redis',
'264:db.Amazon Redshift',
'265:db.H2',
'266:db.MariaDB',
'267:db.Exasol',
'268:db.ClickHouse',
'269:db.Other',
'270:db_adopt.No, not planning to adopt / migrate',
'271:db_adopt.Yes, planning to adopt / migrate to other database(s) - Write
in',
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'275:db_adopt.Oracle Database',
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'277:db_adopt.SQLite',
'278:db_adopt.Cassandra',
'279:db_adopt.Couchbase',
'280:db_adopt.HBase',
'281:db_adopt.MongoDB',
'282:db_adopt.Neo4j',
'283:db_adopt.Redis',
'284:db_adopt.Amazon Redshift',
'285:db_adopt.H2',
'286:db_adopt.MariaDB',
'287:db_adopt.ClickHouse',
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'295:testing_types.Security testing',
'296:testing_types.Usability testing',
'297:testing_types.Performance testing',
'298:testing_types.Stress testing',
'299:testing_types.Stability testing',
'300:testing_types.Smoke testing',
'301:testing_types.I'm not sure',
'302:testing_types.Other',
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'304:testers_qa_pskills',
'305:testers_qa_manual',
'306:store_testcases.I don't use any specific tools_',
'307:store_testcases.Microsoft Office documents (such as Excel spreadsheets)',
'308:store_testcases.Special test case management tools',
'309:store_testcases.Other',
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'314:auto_tests_frameworks.NUnit / xUnit_Net',
'315:auto_tests_frameworks.MSTest / VSTest',
'316:auto_tests_frameworks.Robot Framework',
'317:auto_tests_frameworks.Cucumber',
'318:auto_tests_frameworks.SpecFlow',
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'327:auto_tests_tools.Postman',
'328:auto_tests_tools.Other',
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'330:testing_platforms.SauceLabs',
'331:testing_platforms.BrowserStack',
'332:testing_platforms.CrossBrowserTesting',
'333:testing_platforms.Other',
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'336:auto_tests_pl.JavaScript',
'337:auto_tests_pl.Java',
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'339:auto_tests_pl.C#',
'340:auto_tests_pl.Ruby',
'341:auto_tests_pl.Other',
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Bitbucket)',
'343:regularly_tools.Issue tracker (e_g_ Jira, YouTrack)',
'344:regularly_tools.Code review tool (e_g_ Crucible, Upsource)',
'345:regularly_tools.Continuous Integration (CI) or Continuous Delivery (CD)
tool (e_g_ Jenkins, TeamCity)',
'346:regularly_tools.Static analysis tool (e_g_ CodeClimate)',
'347:regularly_tools.Standalone IDE (e_g_ Eclipse, IntelliJ IDEA)',
'348:regularly_tools.Lightweight Desktop Editor (e_g_ Sublime Text, Atom, VS
Code, Vim)',
'349:regularly_tools.In-cloud Editor or IDE',
'350:regularly_tools.None',
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'352:ides.IntelliJ IDEA',
'353:ides.Android Studio',
'354:ides.Visual Studio',
'355:ides.Xcode',
'356:ides.PhpStorm',
'357:ides.WebStorm',
'358:ides.RubyMine',
'359:ides.PyCharm',
'360:ides.Vim',
'361:ides.Sublime Text',
'362:ides.Atom',
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'367:ides.Eclipse',
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'369:ides.QtCreator',
'370:ides.Emacs',
'371:ides.JetBrains Rider',
'372:ides.Gedit',
'373:ides.IPython/Jupyter Notebook',
'374:ides.DataGrip',
'375:ides.GoLand',
'376:ides.Other',
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'378:communication_tools.Instant messaging/video calling (Slack, Skype,
Hipchat, etc_)',
'379:communication_tools.Video conferencing (Google Meet, Zoom, etc_)',
'380:communication_tools.Calendars (Google Calendar, etc_)',
'381:communication_tools.Corporate portal (MS Sharepoint, Pingboard, etc_)',
'382:communication_tools.Service desk/Help desk (Zendesk, Jira Service Desk,
etc_)',
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'386:mobile_apps.Instant messaging/video calling (Slack, Skype, Hipchat,
etc_)',
'387:mobile_apps.Video conferencing (Google Meet, Zoom, etc_)',
'388:mobile_apps.Calendars (Google Calendar, etc_)',
'389:mobile_apps.Corporate portal (MS Sharepoint, Pingboard, etc_)',
'390:mobile_apps.Service desk/Help desk (Zendesk, Jira Service Desk, etc_)',
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'394:corporate_suite.Office 365 (Outlook, Microsoft Teams, SharePoint, etc)',
'395:corporate_suite.Zoho',
'396:corporate_suite.Other',
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'398:email_clients.Yahoo',
'399:email_clients.Outlook',
'400:email_clients.Thunderbird',
'401:email_clients.Mail in macOS',
'402:email_clients.Other',
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'405:calendar_software.Outlook',
'406:calendar_software.iCal (Calendar App in Mac)',
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'408:calendar_software.IBM Domino',
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'413:chat.WhatsApp',
'414:chat.Hipchat/Stride',
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'417:chat.Rocket_Chat',
'418:chat.Zulip',
'419:chat.Skype',
'420:chat.Google Hangouts',
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'426:video_calls.MS Teams',
'427:video_calls.Google Meet',
'428:video_calls.Polycom',
'429:video_calls.Zoom',
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'435:knowledge_base.Stack Overflow for Teams',
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'440:file_sharing_tools.Dropbox',
'441:file_sharing_tools.OneCloud',
'442:file_sharing_tools.Microsoft OneDrive',
'443:file_sharing_tools.Sharepoint',
'444:file_sharing_tools.On premise FTP server',
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'448:document_collaboration_platforms.Zoho Office Suite',
'449:document_collaboration_platforms. Confluence',
'450:document_collaboration_platforms.Google Docs\xa0',
'451:document_collaboration_platforms.Dropbox Paper',
'452:document_collaboration_platforms.Quip',
'453:document_collaboration_platforms.Other',
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'454:tools_adopted.Source code collaboration tool (e_g_ GitHub, GitLab,
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'455:tools_adopted.Issue tracker (e_g_ Jira, YouTrack)',
'456:tools_adopted.Code review tool (e_g_ Crucible, Upsource)',
'457:tools_adopted.Continuous Integration (CI) or Continuous Delivery (CD) tool
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'458:tools_adopted.Static analysis tool (e_g_ CodeClimate)',
'459:tools_adopted.Standalone IDE (e_g_ Eclipse, IntelliJ IDEA)',
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'461:tools_adopted.Lightweight Desktop Editor (e_g_ Sublime Text, Atom, VS
Code, Vim)',
'462:tools_adopted.In-cloud Editor or IDE',
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'464:tools_ci.TeamCity',
'465:tools_ci.Bamboo',
'466:tools_ci.Microsoft Team Foundation Build',
'467:tools_ci.Travis CI',
'468:tools_ci.Codeship',
'469:tools_ci.CircleCI',
'470:tools_ci.CruiseControl',
'471:tools_ci.GoCD',
'472:tools_ci.Gitlab CI',
'473:tools_ci.Microsoft TFS / Visual Studio Team Services',
'474:tools_ci.AppVeyor',
'475:tools_ci.Drone',
'476:tools_ci.Semaphore CI',
'477:tools_ci.Other',
'478:tools_it.Jira',
'479:tools_it.YouTrack',
'480:tools_it.Redmine',
'481:tools_it.GitLab Issue Board',
'482:tools_it.Asana',
'483:tools_it.Microsoft TFS / Visual Studio Team Services',
'484:tools_it.Trello',
'485:tools_it.GitHub Issues',
'486:tools_it.Other',
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'489:tools_cloud.Continuous Delivery tool',
'490:tools_cloud.Code Review tool',
'491:tools_cloud.Issue Tracker',
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'496:tools_vcs.Mercurial',
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'503:where_sources.Other',
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'506:vc_service.GitLab',
'507:vc_service.Bitbucket',
'508:vc_service.Perforce',
'509:vc_service.Amazon CodeCommit',
'510:vc_service.SourceForge',
'511:vc_service.Custom tool',
'512:vc_service.Microsoft TFS / Visual Studio Team Services',
'513:vc_service.Other',
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'515:vcs_how.Using specialized tools (e_g_ GitKraken, Sourcetree, GitHub
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'516:vcs_how.From IDE',
'517:vcs_how.From web browser',
'518:vcs_how.Other',
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'522:ide_customise.Yes, I use custom keymaps',
'523:ide_customise.Yes, I use plugins',
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'558:java_unittesting.PowerMock',
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'595:java_profiler.YourKit',
'596:java_profiler.NetBeans profiler',
'597:java_profiler.Honest profiler',
'598:java_profiler.async-profiler',
'599:java_profiler.Own custom tools',
'600:java_profiler.Other',
'601:java_ide',
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'603:c_standart.C11',
'604:c_standart.Embedded C',
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'608:c_unittesting.Catch',
'609:c_unittesting.Boost_Test',
'610:c_unittesting.Google Test',
'611:c_unittesting.CppUnit',
'612:c_unittesting.CppUTest',
'613:c_unittesting.CUnit',
'614:c_unittesting.Unity',
'615:c_unittesting.Other',
'616:c_projectmodels.None',
'617:c_projectmodels.Visual Studio project',
'618:c_projectmodels.Xcode project',
'619:c_projectmodels.Autotools',
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'621:c_projectmodels.CMake',
'622:c_projectmodels.Qmake',
'623:c_projectmodels.Custom',
'624:c_projectmodels.Other',
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'627:c_dependencymanager.Conan',
'628:c_dependencymanager.Nuget',
'629:c_dependencymanager.vcpkg',
'630:c_dependencymanager.I rely on a system package manager',
'631:c_dependencymanager.Other',
'632:c_compilers.GCC',
'633:c_compilers.Clang',
'634:c_compilers.MSVC',
'635:c_compilers.Intel',
'636:c_compilers.Compiler for microcontrollers (like Keil, C51 C Compiler, IAR,
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etc_)',
 '637:c_compilers.Custom',
 '638:c_compilers.Other',
 '639:cpp_standart.C++98',
 '640:cpp_standart.C++03',
 '641:cpp_standart.C++11',
 '642:cpp_standart.C++14',
 '643:cpp_standart.C++17',
 "644:cpp_standart_migrate.No, I don't plan to",
 '645:cpp_standart_migrate.C++98',
 '646:cpp_standart_migrate.C++11',
 '647:cpp_standart_migrate.C++14',
 '648:cpp_standart_migrate. ++17',
 '649:cpp_cli.Yes',
 '650:cpp_cli.No',
 '651:cpp_ide.Visual Studio',
 '652:cpp_ide.Visual Studio Code',
 '653:cpp_ide.NetBeans',
 '654:cpp_ide.Eclipse CDT',
 '655:cpp_ide.QtCreator',
 '656:cpp_ide.CLion',
 '657:cpp_ide.Xcode',
 '658:cpp_ide.Atom',
 '659:cpp_ide.Sublime',
 '660:cpp_ide.Vi/Vim',
 '661:cpp_ide.Emacs',
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 '664:cpp_unittesting.Boost_Test',
 '665:cpp_unittesting.Google Test',
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 '677:cpp_dependencymanager.Other',
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 '680:cpp_projectmodels.Xcode project',
 '681:cpp_projectmodels.Autotools',
 '682:cpp_projectmodels.Makefiles',
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'683:cpp_projectmodels.CMake',
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'691:cpp_compilers.Clang',
'692:cpp_compilers.MSVC',
'693:cpp_compilers.Intel',
'694:cpp_compilers.Custom',
'695:cpp_compilers.Other',
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'697:cpp_guidelines_tools.Clang-analyzer / Clang Static Analyzer',
'698:cpp_guidelines_tools.Clang-tidy',
'699:cpp_guidelines_tools.Cppcheck',
'700:cpp_guidelines_tools.Coverity',
'701:cpp_guidelines_tools.Cpplint',
'702:cpp_guidelines_tools.PVS-Studio',
'703:cpp_guidelines_tools.Klocwork',
'704:cpp_guidelines_tools.PC-lint / Flexelint',
'705:cpp_guidelines_tools.Parasoft C/C++test',
'706:cpp_guidelines_tools.QA-C++',
'707:cpp_guidelines_tools.Stack',
'708:cpp_guidelines_tools.Tool provided by my IDE (Visual Studio, ReSharper
C++, CLion, etc_)',
'709:cpp_guidelines_tools.Other',
'710:cpp_guidelines_sources.None',
'711:cpp_guidelines_sources.Effective C++ series (books by Scott Meyers)',
'712:cpp_guidelines_sources.C++ Core Guidelines - main project
(github_com/isocpp/CppCoreGuidelines)',
'713:cpp_guidelines_sources.Guru of the Week / Exceptional C++ series
(blog/books by Herb Sutter)',
'714:cpp_guidelines_sources.C++ Coding Standards (book by Herb Sutter and
Andrei Alexandrescu)',
'715:cpp_guidelines_sources.Abseil tips of the week',
'716:cpp_guidelines_sources.Google C++ Style Guide',
'717:cpp_guidelines_sources.CERT C++ Secure Coding Standard
(www_securecoding_cert_org)',
'718:cpp_guidelines_sources.Coding Standards (Lockheed Martin)',
'719:cpp_guidelines_sources.High Integrity C++ Coding Standard (Programming
Research)',
'720:cpp_guidelines_sources.C++ Core Guidelines - a company-specific
fork/branch augmented with internal rules',
'721:cpp_guidelines_sources.MISRA C++ (MIRA Ltd_)',
'722:cpp_guidelines_sources.Other',
```

```
  '723:cpp_project_size.Small / Medium projects with most commonly used C++
(C++11) features',
  '724:cpp_project_size.Small / Medium projects with heavy use of
templates/variadic templates and other C++11/14/17 features',
  '725:cpp_project_size.Big / Huge projects with many lines of code, libraries,
etc_ but only using the most common C++ (C++11) features',
  '726:cpp_project_size.Big / Huge projects with many lines of code, libraries,
etc_, with heavy use of templates/variadic templates, and other C++11/14/17
features',
  '727:cpp_project_size.Other',
  '728:python_vesion.Python 2',
  '729:python_vesion.Python 3',
  '730:python_for.Educational purposes',
  '731:python_for.Data analysis',
  '732:python_for.System administration / Writing automation scripts /
Infrastructure configuration (DevOps)',
  '733:python_for.Software testing / writing automated tests',
  '734:python_for.Software prototyping',
  '735:python_for.Web development',
  '736:python_for.Programming of web parsers / scrapers / crawlers',
  '737:python_for.Machine learning',
  '738:python_for.Network programming',
  '739:python_for.Desktop development',
  '740:python_for.Computer graphics',
  '741:python_for.Game development',
  '742:python_for.Mobile development',
  '743:python_for.Embedded development',
  '744:python_for.Other',
  '745:python_web_libs.None',
  '746:python_web_libs.Django',
  '747:python_web_libs.TurboGears',
  '748:python_web_libs.web2py',
  '749:python_web_libs.Bottle',
  '750:python_web_libs.CherryPy\xa0',
  '751:python_web_libs.Flask\xa0',
  '752:python_web_libs.Hug',
  '753:python_web_libs.Pyramid\xa0',
  '754:python_web_libs.Tornado',
  '755:python_web_libs.Falcon',
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  '758:python_ds_libs.NumPy',
  '759:python_ds_libs.SciPy',
  '760:python_ds_libs.Pandas',
  '761:python_ds_libs.Matplotlib',
  '762:python_ds_libs.Seaborn',
  '763:python_ds_libs.SciKit-Learn',
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'772:python_other_libs.aiohttp',
'773:python_other_libs.PyQT',
'774:python_other_libs.PyGTK',
'775:python_other_libs.wxPython',
'776:python_other_libs.Pillow',
'777:python_other_libs.Tkinter',
'778:python_other_libs.Pygame',
'779:python_other_libs.Twisted',
'780:python_other_libs.Asyncio',
'781:python_other_libs.Kivy',
'782:python_other_libs.Six',
'783:python_other_libs.Scrapy',
'784:python_other_libs.Other',
'785:python_other_techs.None',
'786:python_other_techs.Sphinx',
'787:python_other_techs.Buildout',
'788:python_other_techs.ORM',
'789:python_other_techs.Other',
'790:python_ide.PyCharm Professional Edition',
'791:python_ide.PyCharm Community Edition',
'792:python_ide.VS Code',
'793:python_ide.Sublime Text',
'794:python_ide.Vim',
'795:python_ide.IntelliJ IDEA',
'796:python_ide.Atom',
'797:python_ide.Emacs',
'798:python_ide.Eclipse + Pydev',
'799:python_ide.IPython Notebook',
'800:python_ide.Jupyter Notebook',
'801:python_ide.NotePad++',
'802:python_ide.Spyder',
'803:python_ide.IDLE',
'804:python_ide.Other',
'805:csharp_version.C# 5 (async / await, caller info attributes)',
'806:csharp_version.C# 6 (? and nameof operators, static imports, exception
filters, Roslyn)',
'807:csharp_version.C# 7 (pattern matching, local functions, ref locals and
returns, out variables)',
'808:csharp_version.An earlier version',
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```
"809:csharp_version.I'm not sure",
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'812:csharp_runtimes._NET Core',
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'815:csharp_frameworks.ASP_NET MVC',
'816:csharp_frameworks.ASP_NET Web Forms',
'817:csharp_frameworks.ASP_NET Core',
'818:csharp_frameworks.Windows Presentation Foundation (WPF)',
'819:csharp_frameworks.Windows Forms',
'820:csharp_frameworks.Windows Communication Foundation (WCF)',
'821:csharp_frameworks.Entity Framework',
'822:csharp_frameworks.Unity3d',
'823:csharp_frameworks.Xamarin',
'824:csharp_frameworks.UWP',
'825:csharp_frameworks.Azure',
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'831:csharp_vsplugins.CodeRush',
'832:csharp_vsplugins.Visual Assist',
'833:csharp_vsplugins.Roslynator',
'834:csharp_vsplugins.Other',
'835:csharp_os.Windows',
'836:csharp_os.Unix / Linux',
'837:csharp_os.macOS',
'838:csharp_os.Other',
'839:csharp_vsc_plugins.None',
'840:csharp_vsc_plugins.C# for Visual Studio Code (powered by OmniSharp)',
'841:csharp_vsc_plugins.NuGet Package Manager',
'842:csharp_vsc_plugins.C# Extensions',
'843:csharp_vsc_plugins.C# XML Documentation Comments',
'844:csharp_vsc_plugins.Code Runner',
'845:csharp_vsc_plugins.ESLint',
'846:csharp_vsc_plugins.TSLint',
'847:csharp_vsc_plugins.ASP_NET Helper',
'848:csharp_vsc_plugins.C# snippets',
'849:csharp_vsc_plugins.Other',
'850:csharp_vsversion',
'851:csharp_vsedition',
'852:csharp_unittesting.None',
'853:csharp_unittesting.MSTest/Visual Studio Unit Testing Framework',
'854:csharp_unittesting.MSTest V2',
'855:csharp_unittesting.NUnit',
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'856:csharp_unittesting.xUnit',
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'860:csharp_performance.Intel VTune Amplifier',
'861:csharp_performance.SciTech _NET memory profiler',
'862:csharp_performance.Windows Performance Toolkit',
"863:csharp_performance.Visual Studio's built-in performance and diagnostic
tools",
'864:csharp_performance.dotTrace',
'865:csharp_performance.dotMemory',
'866:csharp_performance.ANTS Profiler',
'867:csharp_performance.Other',
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'879:php_version.PHP 5_4',
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'884:php_devenviron.Virtualized  (Vagrant, Otto, etc_)',
'885:php_devenviron.Containerized (Docker, Rocket)',
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'890:php_frameworks.Drupal',
'891:php_frameworks.WordPress',
'892:php_frameworks.Zend',
'893:php_frameworks.Magento',
'894:php_frameworks.Laravel',
'895:php_frameworks.Joomla!',
'896:php_frameworks.Yii',
'897:php_frameworks.CakePHP',
'898:php_frameworks.CodeIgniter',
'899:php_frameworks.Slim',
'900:php_frameworks.Other',
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'902:php_ide.Eclipse PDT',
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'904:php_ide.Notepad++',
'905:php_ide.PHPEdit',
'906:php_ide.PhpStorm',
'907:php_ide.Sublime Text',
'908:php_ide.Vim',
'909:php_ide.VS Code',
'910:php_ide.IntelliJ IDEA Ultimate with PHP plugin',
'911:php_ide.Other',
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'914:php_testing.Behat',
'915:php_testing.PHPSpec',
'916:php_testing.Codeception',
'917:php_testing.Atoum',
'918:php_testing.SimpleTest',
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'922:php_qualitytools.PHP CS Fixer',
'923:php_qualitytools.PHPMD',
'924:php_qualitytools.PHPStan',
'925:php_qualitytools.Psalm',
'926:php_qualitytools.Phan',
'927:php_qualitytools.Other',
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'929:php_templateengines.None, I don't render HTML',
'930:php_templateengines.Twig',
'931:php_templateengines.Blade',
'932:php_templateengines.Smarty',
'933:php_templateengines.Mustache',
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'938:php_profiler.XHProf',
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'941:php_profiler.HTTP load testing (ab, siege, etc_)',
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'946:kotlin_target.Native',
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'948:kotlin_jdk.JDK 7',
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'955:kotlin_android.4_4 - 4_4_4 \xa0KitKat \xa0',
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'957:kotlin_android.6_0 - 6_0_1 \xa0Marshmallow',
'958:kotlin_android.7_0 - 7_1_2 \xa0Nougat',
'959:kotlin_android.8_0 - 8_1 \xa0Oreo',
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'963:kotlin_server_client.Browser',
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'965:kotlin_platforms.MacOS (x86_64)',
'966:kotlin_platforms.Android (arm32, arm64)',
'967:kotlin_platforms.Windows (mingw x86_64)',
'968:kotlin_platforms.Linux (x86_64, arm32, MIPS, MIPS little endian)',
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'971:kotlin_app_types.Web Front-end',
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'973:kotlin_app_types.Desktop',
'974:kotlin_app_types.Data analysis / BI',
'975:kotlin_app_types.Machine Learning',
'976:kotlin_app_types.Game development',
'977:kotlin_app_types.IoT',
'978:kotlin_app_types.Embedded',
'979:kotlin_app_types.Library or framework',
'980:kotlin_app_types.Tooling',
'981:kotlin_app_types.Other',
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'984:kotlin_jb_libs.kotlin-wrappers/kotlin-css',
'985:kotlin_jb_libs.kotlin-wrappers/*',
'986:kotlin_jb_libs.kotlinx_coroutines',
'987:kotlin_jb_libs.kotlinx_html',
'988:kotlin_jb_libs.kotlinx_dom',
'989:kotlin_jb_libs.kotlinx_reflect_lite',
'990:kotlin_jb_libs.Anko Commons',
'991:kotlin_jb_libs.Anko Layouts',
'992:kotlin_jb_libs.Anko SQLite',
'993:kotlin_jb_libs.Anko Coroutines',
'994:kotlin_jb_libs.kotlin_test',
'995:kotlin_jb_libs.Ktor',
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    '997:kotlin_jb_libs.Exposed',
    '998:kotlin_jb_libs.Other',
    '999:kotlin_other_libs.None',
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```

[ ]: `col_mapping[999:]`

[ ]:
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    '1003:kotlin_other_libs.KotlinTest',
    '1004:kotlin_other_libs.detekt',
    '1005:kotlin_other_libs.kotlin-logging',
    '1006:kotlin_other_libs.RxKotlin',
    '1007:kotlin_other_libs.Spek',
    '1008:kotlin_other_libs.HamKrest',
    '1009:kotlin_other_libs.Kotlin-NoSQL',
    '1010:kotlin_other_libs.Fuel',
    '1011:kotlin_other_libs.Kotter Knife',
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    '1013:kotlin_other_libs.Kodein',
    '1014:kotlin_other_libs.Klaxon',
    '1015:kotlin_other_libs.mockito-kotlin',
    '1016:kotlin_other_libs.khttp',
    '1017:kotlin_other_libs.spark-kotlin',
    '1018:kotlin_other_libs.javalin',
    '1019:kotlin_other_libs.http4k',
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    '1030:kotlin_other_libs.DBFlow',
    '1031:kotlin_other_libs.Material Dialogs',
    '1032:kotlin_other_libs.Other',
    '1033:kotlin_how_long',
    '1034:kotlin_purposes.For work',
    '1035:kotlin_purposes.For personal/side projects\xa0',
    '1036:kotlin_purposes.I occasionally play around with Kotlin (Hobby)',
    '1037:kotlin_purposes.Other',
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```
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'1039:kotlin_projecttypes.Old projects (migration)',
'1040:kotlin_projecttypes.Other',
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'1042:kotlin_languages_before.JavaScript/TypeScript',
'1043:kotlin_languages_before.C/C++',
'1044:kotlin_languages_before.C#',
'1045:kotlin_languages_before.PHP',
'1046:kotlin_languages_before.Ruby',
'1047:kotlin_languages_before.Scala',
'1048:kotlin_languages_before.Go',
'1049:kotlin_languages_before.Groovy',
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'1051:kotlin_languages_before.Swift',
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'1058:ruby_version.Ruby 2_1',
'1059:ruby_version.Ruby 2_0',
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'1078:ruby_frameworks.Rack',
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'1080:ruby_frameworks.Padrino',
'1081:ruby_frameworks.Hanami',
'1082:ruby_frameworks.Hyperstack',
'1083:ruby_frameworks.Opal',
'1084:ruby_frameworks.Other',
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'1089:ruby_servers.Puma',
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'1092:ruby_servers.Other',
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'1096:ruby_unittesting.RSpec',
'1097:ruby_unittesting.Cucumber',
'1098:ruby_unittesting.MiniTest',
'1099:ruby_unittesting.TestUnit',
'1100:ruby_unittesting.Other',
'1101:swiftoc_platforms.iOS',
'1102:swiftoc_platforms.tvOS',
'1103:swiftoc_platforms.watchOS',
'1104:swiftoc_platforms.macOS',
'1105:swiftoc_platforms.I don't develop for Apple platforms',
'1106:swiftoc_together',
'1107:swiftoc_cpp_libs',
'1108:swiftoc_unittesting.None',
'1109:swiftoc_unittesting.XCTest',
'1110:swiftoc_unittesting.Quick + Nimble',
'1111:swiftoc_unittesting.Kiwi',
'1112:swiftoc_unittesting.Specta',
'1113:swiftoc_unittesting.Other',
'1114:swiftoc_mock.None',
'1115:swiftoc_mock.OCMock',
'1116:swiftoc_mock.OCMockito',
'1117:swiftoc_mock.Expecta',
'1118:swiftoc_mock.OCHamcrest',
'1119:swiftoc_mock.Cuckoo',
'1120:swiftoc_mock.SwiftHamcrest',
'1121:swiftoc_mock.Other',
'1122:swiftoc_ui_tests',
'1123:swiftoc_ui_frameworks.None',
'1124:swiftoc_ui_frameworks.XCTest',
'1125:swiftoc_ui_frameworks.KIF',
'1126:swiftoc_ui_frameworks.EarlGrey',
'1127:swiftoc_ui_frameworks.iOSSnapshotTestCase (FBSnapshotTestCase)',
'1128:swiftoc_ui_frameworks.Other',
'1129:swiftoc_dependecymanager.None',
'1130:swiftoc_dependecymanager.CocoaPods',
'1131:swiftoc_dependecymanager.Carthage',
```

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'1132:swiftoc_dependecymanager.Swift Package Manager',
'1133:swiftoc_dependecymanager.Other',
'1134:swiftoc_db_engine.None',
'1135:swiftoc_db_engine.SQLite with my own wrapper',
'1136:swiftoc_db_engine.CoreData',
'1137:swiftoc_db_engine.Realm',
'1138:swiftoc_db_engine.Firebase',
'1139:swiftoc_db_engine.YAPDataBase',
'1140:swiftoc_db_engine.Other',
'1141:swiftoc_db_viewer_do',
'1142:swiftoc_db_viewer',
'1143:swiftoc_build.I build my project from the IDE',
'1144:swiftoc_build.I use Fastlane',
'1145:swiftoc_build.I build on CI',
'1146:swiftoc_build.Other',
'1147:swiftoc_linux.Yes',
'1148:swiftoc_linux.No, but I plan to in the next 12 months',
'1149:swiftoc_linux.No, and I don't plan to in the next 12 months',
'1150:swiftoc_serverside',
'1151:swiftoc_serverside_frameworks.Kitura',
'1152:swiftoc_serverside_frameworks.Vapor',
'1153:swiftoc_serverside_frameworks.Perfect',
'1154:swiftoc_serverside_frameworks.Other',
'1155:scala_version.2_13',
'1156:scala_version.2_12',
'1157:scala_version.2_11',
'1158:scala_version.2_10 or older',
'1159:scala_version.Other',
'1160:scala_compilationtarget.JVM',
'1161:scala_compilationtarget.scala_js',
'1162:scala_compilationtarget.Other',
'1163:scala_java_version.Java 11',
'1164:scala_java_version.Java 10',
'1165:scala_java_version.Java 9',
'1166:scala_java_version.Java 8',
'1167:scala_java_version.Java 7',
'1168:scala_java_version.Other',
'1169:scala_unittesting.None',
'1170:scala_unittesting.ScalaTest',
'1171:scala_unittesting.ScalaMock',
'1172:scala_unittesting.TestNG',
'1173:scala_unittesting.JUnit',
'1174:scala_unittesting.ScalaCheck',
'1175:scala_unittesting.specs2',
'1176:scala_unittesting.µTest',
'1177:scala_unittesting.Other',
'1178:scala_frameworks_web.None',
```

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'1179:scala_frameworks_web.Akka-http',
'1180:scala_frameworks_web.Netty',
'1181:scala_frameworks_web.Spark Java',
'1182:scala_frameworks_web.Play',
'1183:scala_frameworks_web.Spray',
'1184:scala_frameworks_web.Scalatra',
'1185:scala_frameworks_web.Finatra',
'1186:scala_frameworks_web.Spring',
'1187:scala_frameworks_web.sttp',
'1188:scala_frameworks_web.Http4s',
'1189:scala_frameworks_web.Other',
'1190:scala_frameworks.None',
'1191:scala_frameworks.Scala_js',
'1192:scala_frameworks.Twitter Util',
'1193:scala_frameworks.Akka',
'1194:scala_frameworks.Spark',
'1195:scala_frameworks.Scalaz',
'1196:scala_frameworks.Scalacheck',
'1197:scala_frameworks.Specs2',
'1198:scala_frameworks.Shapeless',
'1199:scala_frameworks.Finagle',
'1200:scala_frameworks.Cats',
'1201:scala_frameworks.Breeze',
'1202:scala_frameworks.Slick',
'1203:scala_frameworks.Other',
'1204:scala_ide.IntelliJ IDEA',
'1205:scala_ide.Other',
'1206:scala_buildsystem.Maven',
'1207:scala_buildsystem.Gradle',
'1208:scala_buildsystem.sbt',
'1209:scala_buildsystem.Other',
'1210:scala_sbt.1_0',
'1211:scala_sbt.0_13 or older',
'1212:scala_interactive.None',
'1213:scala_interactive.Scala REPL',
'1214:scala_interactive.sbt console',
'1215:scala_interactive.Ammonite REPL',
'1216:scala_interactive.Scastie',
'1217:scala_interactive.IntelliJ IDEA Worksheet',
'1218:scala_interactive.Scala IDE Worksheet',
'1219:scala_interactive.Apache Zeppelin Notebook',
'1220:scala_interactive.Jupyter Notebook',
'1221:scala_interactive.Other',
'1222:scala_compiler_plugins.None',
'1223:scala_compiler_plugins.Scalamacros/Scalameta Paradise',
'1224:scala_compiler_plugins.Kind Projector',
'1225:scala_compiler_plugins.Other',
```

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'1226:scala_macros.Yes, including whitebox macros',
'1227:scala_macros.Only blackbox macros',
'1228:scala_macros.Only in libraries',
'1229:scala_macros.No',
'1230:scala_macros.I don't know anything about macros in Scala',
'1231:js_frameworks.None',
'1232:js_frameworks.AngularJS',
'1233:js_frameworks.Angular',
'1234:js_frameworks.React',
'1235:js_frameworks.React Native',
'1236:js_frameworks.Cordova / PhoneGap',
'1237:js_frameworks.Express',
'1238:js_frameworks.Vue_js',
'1239:js_frameworks.Meteor',
'1240:js_frameworks.Ember',
'1241:js_frameworks.Backbone',
'1242:js_frameworks.Polymer',
'1243:js_frameworks.Electron',
'1244:js_frameworks.Other',
'1245:js_ide.WebStorm (or another JetBrains IDE)',
'1246:js_ide.Sublime Text',
'1247:js_ide.Atom',
'1248:js_ide.VS Code',
'1249:js_ide.Vi / Vim',
'1250:js_ide.Visual Studio',
'1251:js_ide.NotePad++',
'1252:js_ide.Emacs',
'1253:js_ide.Other',
'1254:js_unittesting.None',
'1255:js_unittesting.Mocha',
'1256:js_unittesting.Jest',
'1257:js_unittesting.Ava',
'1258:js_unittesting.Karma',
'1259:js_unittesting.Jasmine',
'1260:js_unittesting.Other',
'1261:js_moduleloader.None',
'1262:js_moduleloader.Browserify',
'1263:js_moduleloader.Webpack',
'1264:js_moduleloader.RequireJS',
'1265:js_moduleloader.SystemJS',
'1266:js_moduleloader.Rollup',
'1267:js_moduleloader.Parcel',
'1268:js_moduleloader.Other',
'1269:js_sslang.CSS',
'1270:js_sslang.Sass',
'1271:js_sslang.SCSS',
'1272:js_sslang.Less',
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'1273:js_sslang.PostCSS',
'1274:js_sslang.CSS-in-JS',
'1275:js_sslang.CSS Modules',
'1276:js_sslang.Stylus',
'1277:js_sslang.Other',
'1278:js_graphql',
'1279:js_monorepo',
'1280:rust_how.Work',
'1281:rust_how.Personal / side projects',
'1282:rust_how.Hobby',
'1283:rust_how.Other',
'1284:rust_how_long',
'1285:rust_version.Current stable release',
'1286:rust_version.Previous stable release',
'1287:rust_version.Beta release',
'1288:rust_version.Nightly',
'1289:rust_version.1_30 or older',
'1290:rust_other_langs.None',
'1291:rust_other_langs.C',
'1292:rust_other_langs.C++',
'1293:rust_other_langs.Python',
'1294:rust_other_langs.Java',
'1295:rust_other_langs.Go',
'1296:rust_other_langs.JavaScript',
'1297:rust_other_langs.Other',
'1298:rust_code_interact.Language interop (foreign functions)',
'1299:rust_code_interact.RPC',
'1300:rust_code_interact.REST API',
'1301:rust_code_interact.Other',
'1302:rust_os',
'1303:rust_install_combined',
'1304:rust_ide.Atom',
'1305:rust_ide.Emacs',
'1306:rust_ide.IntelliJ IDEA',
'1307:rust_ide.CLion',
'1308:rust_ide.Sublime Text',
'1309:rust_ide.Vim',
'1310:rust_ide.VSCode (Visual Studio Code)',
'1311:rust_ide.Other',
'1312:rust_primary_ide',
'1313:rust_ide_mostlove.Speed/performance',
'1314:rust_ide_mostlove.Ease of use',
'1315:rust_ide_mostlove.Code completion',
'1316:rust_ide_mostlove.Code navigation',
'1317:rust_ide_mostlove.Error highlighting',
'1318:rust_ide_mostlove.Tools integration',
'1319:rust_ide_mostlove.Debugger support',
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'1320:rust_ide_mostlove.Other',
'1321:rust_ide_lack.Speed/performance',
'1322:rust_ide_lack.Ease of use',
'1323:rust_ide_lack.Code completion',
'1324:rust_ide_lack.Code navigation',
'1325:rust_ide_lack.Error highlighting',
'1326:rust_ide_lack.Tools integration',
'1327:rust_ide_lack.Debugger support',
'1328:rust_ide_lack.Other',
'1329:rust_build_tool.Cargo',
'1330:rust_build_tool.Other',
'1331:rust_testing.I don't use testing frameworks',
'1332:rust_testing.Rust tests',
'1333:rust_testing.Other',
'1334:rust_code_coverage.I don't use code coverage tools',
'1335:rust_code_coverage.codecov',
'1336:rust_code_coverage.Other',
'1337:rust_profiler.I don't use profiling tools',
'1338:rust_profiler.perf',
'1339:rust_profiler.callgrind/cachegrind',
'1340:rust_profiler.Other',
'1341:rust_projecttypes.Web development',
'1342:rust_projecttypes.Systems programming',
'1343:rust_projecttypes.DevOps',
'1344:rust_projecttypes.Network programming',
'1345:rust_projecttypes.Databases',
'1346:rust_projecttypes.Security',
'1347:rust_projecttypes.Desktop / GUI applications',
'1348:rust_projecttypes.Embedded devices / Internet of Things',
'1349:rust_projecttypes.Academic / Scientific / Numeric',
'1350:rust_projecttypes.Machine learning / Artificial intelligence',
'1351:rust_projecttypes.Games',
'1352:rust_projecttypes.Other',
'1353:rust_platforms.Linux',
'1354:rust_platforms.Windows',
'1355:rust_platforms.macOS',
'1356:rust_platforms.Android',
'1357:rust_platforms.iOS',
'1358:rust_platforms.WebAssembly',
'1359:rust_platforms.Embedded',
'1360:rust_code_size',
'1361:rust_external_deps',
'1362:rust_current_codebase',
'1363:rust_devs_count',
'1364:sql_mssql.2017',
'1365:sql_mssql.2016',
'1366:sql_mssql.2014',
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'1367:sql_mssql.2012',
'1368:sql_mssql.2008 R2',
'1369:sql_mssql.2008',
'1370:sql_mssql.2005',
'1371:sql_mssql.2000',
"1372:sql_mssql.I'm not sure",
'1373:sql_oracle.18c',
'1374:sql_oracle.12_x',
'1375:sql_oracle.11_x',
'1376:sql_oracle.10_x',
'1377:sql_oracle.9_x',
"1378:sql_oracle.I'm not sure",
'1379:sql_oracle.Other',
'1380:sql_mysql.8_0',
'1381:sql_mysql.5_7',
'1382:sql_mysql.5_6',
'1383:sql_mysql.5_5',
'1384:sql_mysql.5_4',
"1385:sql_mysql.I'm not sure",
'1386:sql_mysql.Other',
'1387:sql_postgresql.11',
'1388:sql_postgresql.10',
'1389:sql_postgresql.9_6',
'1390:sql_postgresql.9_5',
'1391:sql_postgresql.9_4',
'1392:sql_postgresql.9_3',
'1393:sql_postgresql.9_2',
'1394:sql_postgresql.9_1',
'1395:sql_postgresql.9_0',
"1396:sql_postgresql.I'm not sure",
'1397:sql_postgresql.Other',
'1398:sql_db2.11_x',
'1399:sql_db2.10_x',
'1400:sql_db2.9_x',
'1401:sql_db2.8_x',
'1402:sql_db2.7_x',
'1403:sql_db2.Other',
'1404:sql_sqlite',
'1405:sql_tool.None',
'1406:sql_tool.MySQL Workbench',
'1407:sql_tool.pgAdmin',
'1408:sql_tool.Oracle SQL Developer',
'1409:sql_tool.SQL Server Management Studio',
'1410:sql_tool.DataGrip',
'1411:sql_tool.phpMyAdmin',
'1412:sql_tool.Navicat',
'1413:sql_tool.Toad',
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'1414:sql_tool.EMS SQL Manager',
'1415:sql_tool.dbForge Studio',
'1416:sql_tool.HeidiSQL',
'1417:sql_tool.DbVisualizer',
'1418:sql_tool.DBeaver',
'1419:sql_tool.Sequel Pro',
'1420:sql_tool.SQuirreL SQL',
'1421:sql_tool.Command Line',
'1422:sql_tool.JetBrains IDE(s) (IntelliJ IDEA, PhpStorm, etc_) with the
Database plugin',
'1423:sql_tool.Robo 3T',
'1424:sql_tool.PL / SQL Developer',
'1425:sql_tool.Other',
'1426:go_how',
'1427:go_multipleversions',
'1428:go_gopath',
'1429:go_multipleprojects',
'1430:go_templateengines.None',
'1431:go_templateengines.text/template',
'1432:go_templateengines.html/template',
'1433:go_templateengines.Plush',
'1434:go_templateengines.Pongo2',
'1435:go_templateengines.Other',
'1436:go_packagemanager.None',
'1437:go_packagemanager.dep',
'1438:go_packagemanager.godep',
'1439:go_packagemanager.glide',
'1440:go_packagemanager.govendor',
'1441:go_packagemanager.Go Modules',
'1442:go_packagemanager.gpm',
'1443:go_packagemanager.Other',
'1444:go_ide',
"1445:go_packagemanager_migrate.No, I don't plan to",
'1446:go_packagemanager_migrate.Yes, planning to adopt / migrate to other
package manager(s) - Write in',
'1447:go_packagemanager_migrate.dep',
'1448:go_packagemanager_migrate.godep',
'1449:go_packagemanager_migrate.Go Modules',
'1450:go_frameworks.None',
'1451:go_frameworks.Buffalo',
'1452:go_frameworks.Gin',
'1453:go_frameworks.Macaron',
'1454:go_frameworks.Echo',
'1455:go_frameworks.Beego',
'1456:go_frameworks.Revel',
'1457:go_frameworks.Other',
'1458:go_router.None',
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'1459:go_router.standard library',
'1460:go_router.gorilla / mux',
'1461:go_router.go-chi / chi',
'1462:go_router.julienschmidt / httproute',
'1463:go_router.gocraft / web',
'1464:go_router.Other',
'1465:go_testing.None',
'1466:go_testing.built-in testing',
'1467:go_testing.gocheck',
'1468:go_testing.testify',
'1469:go_testing.ginkgo',
'1470:go_testing.gomega',
'1471:go_testing.goconvey',
'1472:go_testing.gomock',
'1473:go_testing.go-sqlmock',
'1474:go_testing.httpexpect',
'1475:go_testing.Other',
'1476:go_external_deps',
'1477:go_code_size',
'1478:go_modules_outside',
'1479:go_migrate',
'1480:go_buildsystem.Go build',
'1481:go_buildsystem.Bazel',
'1482:go_buildsystem.Other',
'1483:code_in_dreams',
'1484:devops_involved',
'1485:devops_conf_management.None',
'1486:devops_conf_management.Puppet',
'1487:devops_conf_management.Chef',
'1488:devops_conf_management.Ansible',
'1489:devops_conf_management.Salt',
'1490:devops_conf_management.Custom solution',
'1491:devops_conf_management.Other',
'1492:devops_server_templating.None',
'1493:devops_server_templating.Docker',
'1494:devops_server_templating.Vagrant',
'1495:devops_server_templating.Packer',
'1496:devops_server_templating.CoreOS rkt',
'1497:devops_server_templating.Other',
'1498:devops_infr_provisioning.None',
'1499:devops_infr_provisioning.Terraform',
'1500:devops_infr_provisioning.CloudFormation',
'1501:devops_infr_provisioning.TOSCA/Cloudify',
'1502:devops_infr_provisioning.OpenStack Heat',
'1503:devops_infr_provisioning.Other',
'1504:devops_use_docker.Run dockerized utilities',
'1505:devops_use_docker.Run your application in one container, and backing
```

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services (e_g_ database)',
 '1506:devops_use_docker.Run multiple application containers (e_g_
microservices)',
 '1507:devops_use_docker.Other',
 '1508:devops_use_compose',
 '1509:devops_container_orchestration.None',
 '1510:devops_container_orchestration.Amazon ECS / Fargate',
 '1511:devops_container_orchestration.Amazon EKS',
 '1512:devops_container_orchestration.Mesos or DC / OS',
 '1513:devops_container_orchestration.Kubernetes (self-managed or fully
managed)',
 '1514:devops_container_orchestration.Hashicorp Nomad',
 '1515:devops_container_orchestration.Docker Swarm',
 '1516:devops_container_orchestration.CoreOS Tectonic',
 '1517:devops_container_orchestration.Other',
 '1518:devops_run_cont_apps.Docker Compose',
 '1519:devops_run_cont_apps.Minikube',
 '1520:devops_run_cont_apps.Other',
 '1521:devops_deploy_docker_repo.I do not deploy',
 '1522:devops_deploy_docker_repo.I use only the command line',
 '1523:devops_deploy_docker_repo.I use a configuration management tool (Chef,
Puppet, Ansible, etc_)',
 '1524:devops_deploy_docker_repo.I deploy from CI / CD',
 '1525:devops_deploy_docker_repo.I deploy with custom / in-house tools',
 '1526:devops_deploy_docker_repo.Other',
 "1527:devops_keep_artifacts.I don't keep artifacts",
 '1528:devops_keep_artifacts.Pulp',
 '1529:devops_keep_artifacts.Amazon S3',
 '1530:devops_keep_artifacts.Archiva',
 '1531:devops_keep_artifacts.NuGet',
 '1532:devops_keep_artifacts.Nexus',
 '1533:devops_keep_artifacts.JFrog Artifactory',
 '1534:devops_keep_artifacts.MyGet',
 '1535:devops_keep_artifacts.npm',
 '1536:devops_keep_artifacts.Docker Hub (private or public)',
 '1537:devops_keep_artifacts.Custom tool',
 '1538:devops_keep_artifacts.Other',
 '1539:where_host.Locally (on your workstation, developer environment or
device)',
 '1540:where_host.Private Servers (hosted on your company's cluster or server
on-premises)',
 '1541:where_host.Cloud Service (AWS, MS Azure, GCP, etc_)',
 '1542:where_host.Other',
 '1543:devops_deploy_cloud.Run scripts on your local workstation / VM',
 '1544:devops_deploy_cloud.Use Continuous Integration / Continuous Delivery',
 "1545:devops_deploy_cloud.Use your cloud provider's web interface",
 '1546:devops_deploy_cloud.Other',
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'1547:where_host_primarly',
'1548:cloud_services.Amazon Web Services',
'1549:cloud_services.Microsoft Azure',
'1550:cloud_services.Google Cloud Platform',
'1551:cloud_services.Rackspace',
'1552:cloud_services.RedHat OpenShift',
'1553:cloud_services.IBM SoftLayer',
'1554:cloud_services.Cloud Foundry',
'1555:cloud_services.Heroku',
'1556:cloud_services.Other',
'1557:where_host_plan.Locally (on your workstation, developer environment or
device)',
'1558:where_host_plan.Private Servers (hosted on your company's cluster or
server on-premises)',
'1559:where_host_plan.Amazon Web Services',
'1560:where_host_plan.Microsoft Azure',
'1561:where_host_plan.Google Cloud Platform',
'1562:where_host_plan.Rackspace',
'1563:where_host_plan.RedHat OpenShift',
'1564:where_host_plan.IBM SoftLayer',
'1565:where_host_plan.Cloud Foundry',
'1566:where_host_plan.Heroku',
'1567:where_host_plan.Other',
'1568:use_static_analysis',
'1569:hours_code_job',
'1570:hours_code_hobby.I don't have a side project',
'1571:hours_code_hobby.Less than 1 hour a week',
'1572:hours_code_hobby.1-2 hours a week',
'1573:hours_code_hobby.3-8 hours a week',
'1574:hours_code_hobby.9-16 hours a week',
'1575:hours_code_hobby.17-32 hours a week',
'1576:hours_code_hobby.32 hours a week or more',
'1577:contribute_os.I work full time on open-source code and get paid for it',
'1578:contribute_os.I work full time on open-source code but do not get paid
for it',
'1579:contribute_os.Yes, regularly (at least once a month)',
'1580:contribute_os.Yes, from time to time (several times a year)',
'1581:contribute_os.Only contributed a few times',
'1582:contribute_os.No, but I would like to',
'1583:contribute_os.No, and I would not like to',
'1584:where_survey',
'1585:code_weekends.Yes',
'1586:code_weekends.No',
'1587:accounts.None of the above',
'1588:accounts.Facebook',
'1589:accounts.Twitter',
'1590:accounts.LinkedIn',
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'1591:accounts.QQ',
'1592:accounts.Qzone',
'1593:accounts.Baidu Tieba',
'1594:accounts.Quora',
'1595:accounts.Zhihu ( )',
'1596:accounts.XING',
'1597:accounts.Instagram',
'1598:accounts.VKontakte',
'1599:accounts.GitHub',
'1600:accounts.StackOverflow',
'1601:accounts.Reddit',
'1602:accounts.Other',
'1603:commute.I work / study from home',
'1604:commute.Car',
'1605:commute.Public transport',
'1606:commute.Bike',
'1607:commute.Motorcycle',
'1608:commute.By foot',
'1609:commute.Other',
'1610:fuel',
'1611:visit_meetups.Yes',
'1612:visit_meetups.No, but I am planning to',
'1613:visit_meetups.No, since there are no meetups in my area',
'1614:visit_meetups.No, I am unable to do so for certain reasons',
'1615:visit_meetups.No, and I do not want to',
'1616:visit_meetups.Other',
'1617:learn_pl.I am not learning any programming languages',
'1618:learn_pl.Java',
'1619:learn_pl. ',
'1620:learn_pl.C++',
'1621:learn_pl.Python',
'1622:learn_pl.C#',
'1623:learn_pl.PHP',
'1624:learn_pl.JavaScript',
'1625:learn_pl.Ruby',
'1626:learn_pl.Kotlin',
'1627:learn_pl.Swift',
'1628:learn_pl.Scala',
'1629:learn_pl.Go',
'1630:learn_pl.R',
'1631:learn_pl.TypeScript',
'1632:learn_pl.Haskell',
'1633:learn_pl.Elixir',
'1634:learn_pl.Clojure',
'1635:learn_pl.Rust',
'1636:learn_pl.Other',
'1637:learn_what.I did not learn any new tools / technologies / programming
```

```
languages in the last 12 months',
 '1638:learn_what.Offline educational organizations',
 '1639:learn_what.Books',
 '1640:learn_what.Personal teacher/consultant',
 '1641:learn_what.Online coding schools',
 '1642:learn_what.MOOCs (Coursera, edX, Udacity, etc_)',
 '1643:learn_what.Blogs/forums',
 '1644:learn_what.Documentation & APIs',
 '1645:learn_what.Other',
 '1646:learn_kind_of_content',
 '1647:learn_time',
 '1648:cats_dogs',
 '1649:company_size.Just me',
 '1650:company_size.2-10',
 '1651:company_size.11-50',
 '1652:company_size.51-500',
 '1653:company_size.501-1,000',
 '1654:company_size.1,001-5,000',
 '1655:company_size.More than 5,000',
 '1656:company_size.Not sure',
 '1657:it_core',
 '1658:sectors_it.Telecom',
 '1659:sectors_it.Game development (including mobile games)',
 '1660:sectors_it.Mobile development',
 '1661:sectors_it.IoT / embedded',
 '1662:sectors_it.IT services',
 '1663:sectors_it.Cloud computing / platform',
 '1664:sectors_it.Big Data / Data analysis',
 '1665:sectors_it.Hardware',
 '1666:sectors_it.Data center services',
 '1667:sectors_it.Software development tools',
 '1668:sectors_it.Internet / Search engines',
 '1669:sectors_it.Semiconductors',
 '1670:sectors_it.E-learning',
 '1671:sectors_it.FinTech',
 '1672:sectors_it.Healthcare IT',
 '1673:sectors_it.Cybersecurity',
 '1674:sectors_it.BPO services',
 '1675:sectors_it.Other Software (all other types of software)',
 '1676:sectors_it.Other',
 '1677:sectors_nonit.Government and defense',
 '1678:sectors_nonit.Administration / Management / Business Development',
 '1679:sectors_nonit.Banking / Real Estate / Mortgage Financing / Accounting /
Finance / Insurance',
 '1680:sectors_nonit.Business / Strategic Management',
 '1681:sectors_nonit.Construction / Architecture',
 '1682:sectors_nonit.Customer Support',
```

```
'1683:sectors_nonit.Design',
'1684:sectors_nonit.Education / Training',
'1685:sectors_nonit.Human Resources',
'1686:sectors_nonit.Law',
'1687:sectors_nonit.Logistics/ Transportation',
'1688:sectors_nonit.Machinery',
'1689:sectors_nonit.Aerospace',
'1690:sectors_nonit.Automotive and boating',
'1691:sectors_nonit.Manufacturing',
'1692:sectors_nonit.Marketing',
'1693:sectors_nonit.Medicine / Health',
'1694:sectors_nonit.Non-profit',
'1695:sectors_nonit.Entertainment / Mass media and information / Publishing',
'1696:sectors_nonit.Restaurants / Hospitality / Tourism',
'1697:sectors_nonit.Sales / Distribution / Retail',
'1698:sectors_nonit.Food / Agriculture',
'1699:sectors_nonit.Science',
'1700:sectors_nonit.Security',
'1701:sectors_nonit.Service / Maintenance',
'1702:sectors_nonit.Energy',
'1703:sectors_nonit.Other',
'1704:kind_of_dev.Product development',
'1705:kind_of_dev.Outsourcing',
'1706:kind_of_dev.Custom-tailored software / websites / applications',
'1707:kind_of_dev.In-house development',
'1708:kind_of_dev.Internal deployment and maintenance of third-party tools',
'1709:kind_of_dev.Customer services development (websites, mobile apps, etc_)',
'1710:kind_of_dev.Open source projects',
'1711:kind_of_dev.Other',
'1712:advocate',
'1713:team_size',
'1714:agile_framework.None',
'1715:agile_framework.Scrum',
'1716:agile_framework.Kanban',
'1717:agile_framework.XP',
'1718:agile_framework.Combined',
'1719:agile_framework.Other',
'1720:pair_programming',
'1721:team_distributed',
'1722:it_experience.None',
'1723:it_experience.Less than 1 year',
'1724:it_experience.1 - 2 years',
'1725:it_experience.3 - 5 years',
'1726:it_experience.6 - 10 years',
'1727:it_experience.11+ years',
'1728:salary',
'1729:age_range.17 or younger',
```

```
    '1730:age_range.18-20',
    '1731:age_range.21-29',
    '1732:age_range.30-39',
    '1733:age_range.40-49',
    '1734:age_range.50-59',
    '1735:age_range.60 or older',
    '1736:country',
    '1737:channel']
```

Split column map into two, lots of columns. Seems that a lot are just for response options, though.

```
[ ]: jb.iloc[:,7] = jb.iloc[:,7].notnull().astype('int')
```

```
[ ]: jb_data = jb[jb.iloc[:,7] == 1]
```

Converted data career option to boolean (1/0), pulled slice of just those.

```
[ ]: jbsalorder = ['1,000 or less', '1,001 - 2,000', '2, 001 - 3,000', '3,001 -␣
    ↪4,000', '4,001 - 5,000', '5,001 - 7,000', '7,001 - 9,000', '9,001 - 11,000',␣
    ↪'11,001 - 13,000', '13,001 - 15,000', '15,001 - 20,000', '20,001 - 25,000',␣
    ↪'25,001 - 30,000', '30,001 - 35,000', '35,001 - 40,000', '40,001 - 45,000',␣
    ↪'45,001 - 50,000', '50,001 - 55,000', '55,001 - 60,000', '60,001 - 65,000',␣
    ↪'65,001 - 75,000', '75,001 - 80,000', '80,001 - 85,000', '85,001 - 90,000',␣
    ↪'90,001 - 95,000', '95,001 - 100,000', '100,001 - 110,000', '110,001 -␣
    ↪120,000','120,001 - 140,000', '140,001 - 160,000', '160,001 - 180,000',␣
    ↪'180,001 - 200,000', 'More than 200,000']
    plt.figure(figsize=(10, 7))
    ax = sns.countplot(y=jb_data.iloc[:,1728], order=jbsalorder, palette="bone_r")
    plt.title('Salary Ranges for Data Careers (JetBrains)')
```

```
[ ]: Text(0.5, 1.0, 'Salary Ranges for Data Careers (JetBrains)')
```

Salary Ranges for Data Careers (JetBrains)
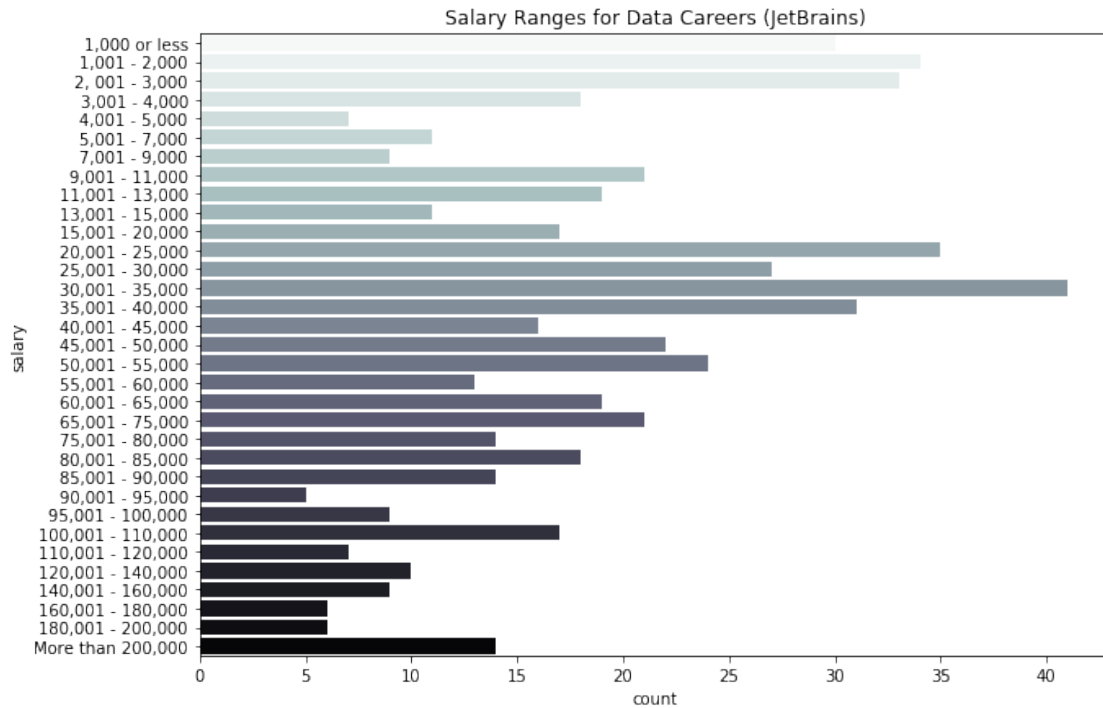
```
jb_data_itexp = pd.melt(jb_data.iloc[:,1722:1728])
jb_data_itexp.head()
```

```
        variable value
0  it_experience.None    NaN
1  it_experience.None    NaN
2  it_experience.None    NaN
3  it_experience.None    NaN
4  it_experience.None    NaN
```

```
ax = sns.countplot(y=jb_data_itexp['value'])
plt.title('Length of IT experience in data fields (JetBrains)')
ax.set(xlabel='count', ylabel='')
```

```
[Text(0, 0.5, ''), Text(0.5, 0, 'count')]
```

Length of IT experience in data fields (JetBrains)
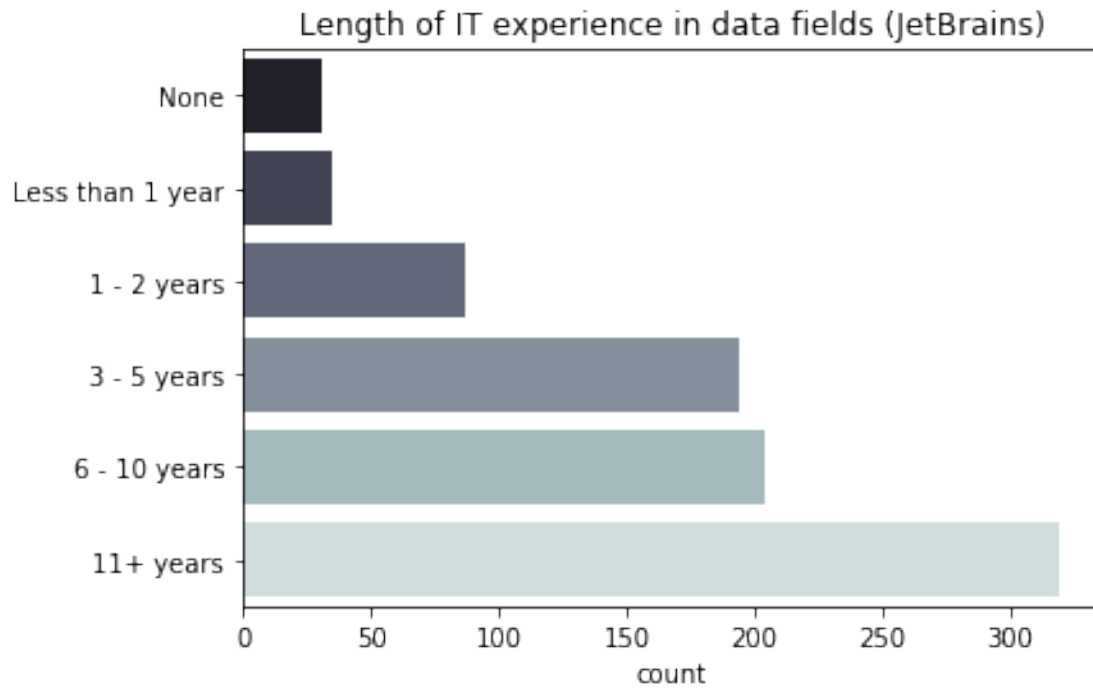
```
hcountplotmelt(jb_data.iloc[:,1722:1728])
plt.title('Length of IT experience in data fields (JetBrains)')
```

[ ]: Text(0.5, 1.0, 'Length of IT experience in data fields (JetBrains)')

Length of IT experience in data fields (JetBrains)
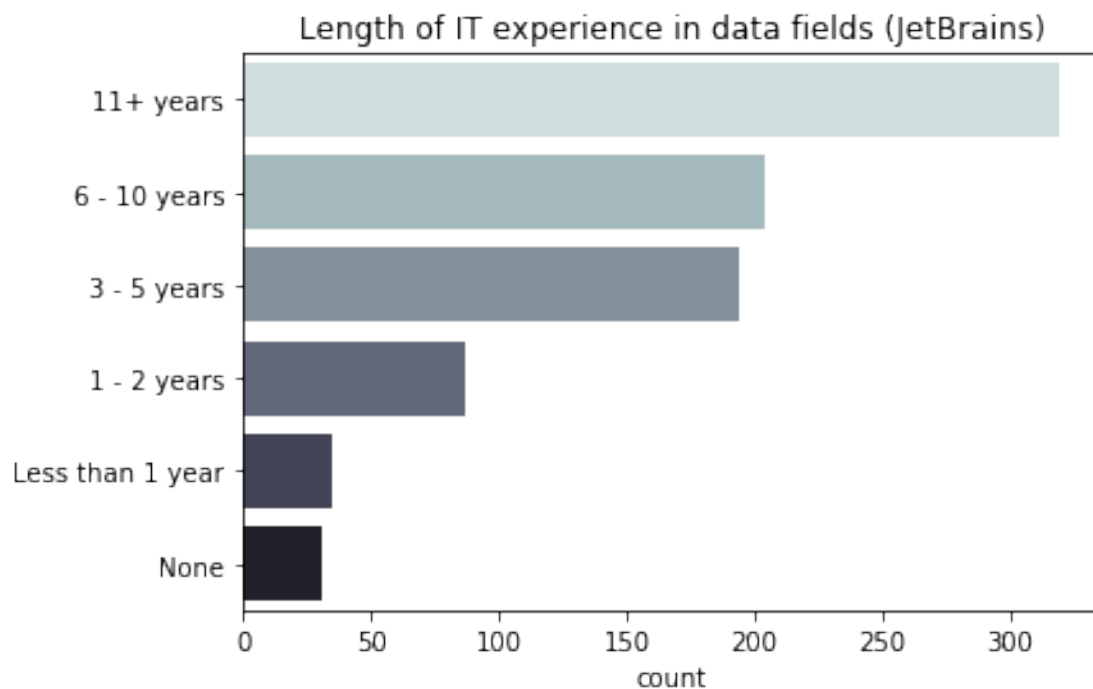
Use melt function to condense options into one series, then create countplot.

```
[ ]: hcountplotmelt(jb_data.iloc[:, 24:36])
     plt.title('Apps developed for money by data careers (JetBrains)')
```

```
[ ]: Text(0.5, 1.0, 'Apps developed for money by data careers (JetBrains)')
```
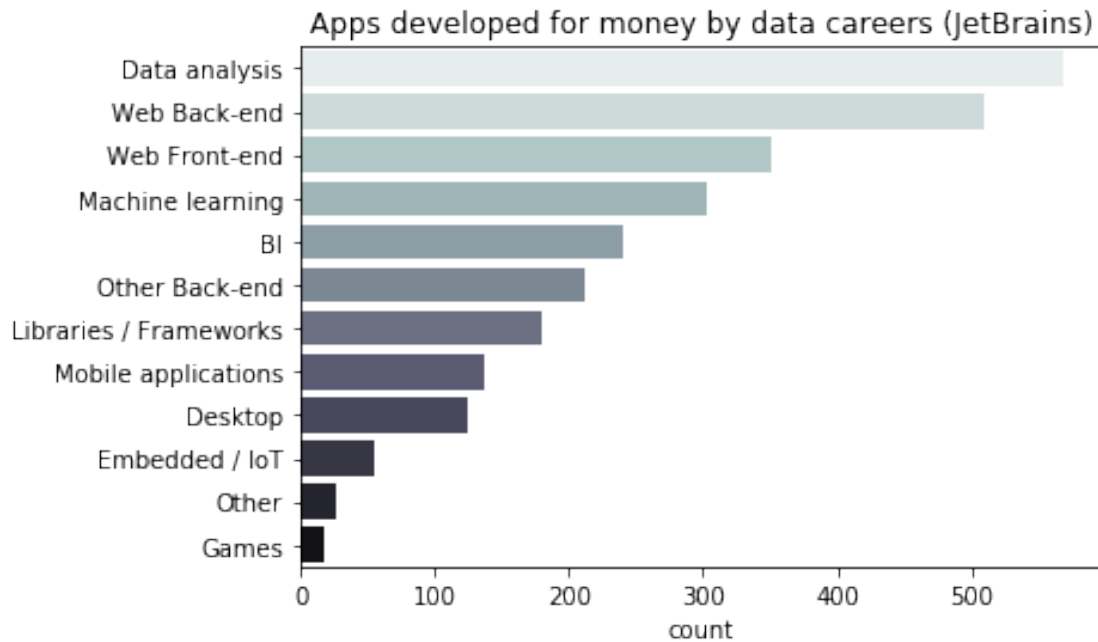


```
[ ]: hcountplotmelt(jb_data.iloc[:, 37:49])
     plt.title('Apps developed as a hobby by data careers (JetBrains)')
```

```
[ ]: Text(0.5, 1.0, 'Apps developed as a hobby by data careers (JetBrains)')
```

Apps developed as a hobby by data careers (JetBrains)

Web Back-end
Machine learning
Web Front-end
Data analysis
Libraries / Frameworks
Mobile applications
Games
Embedded / IoT
Desktop
Other Back-end
BI
Other
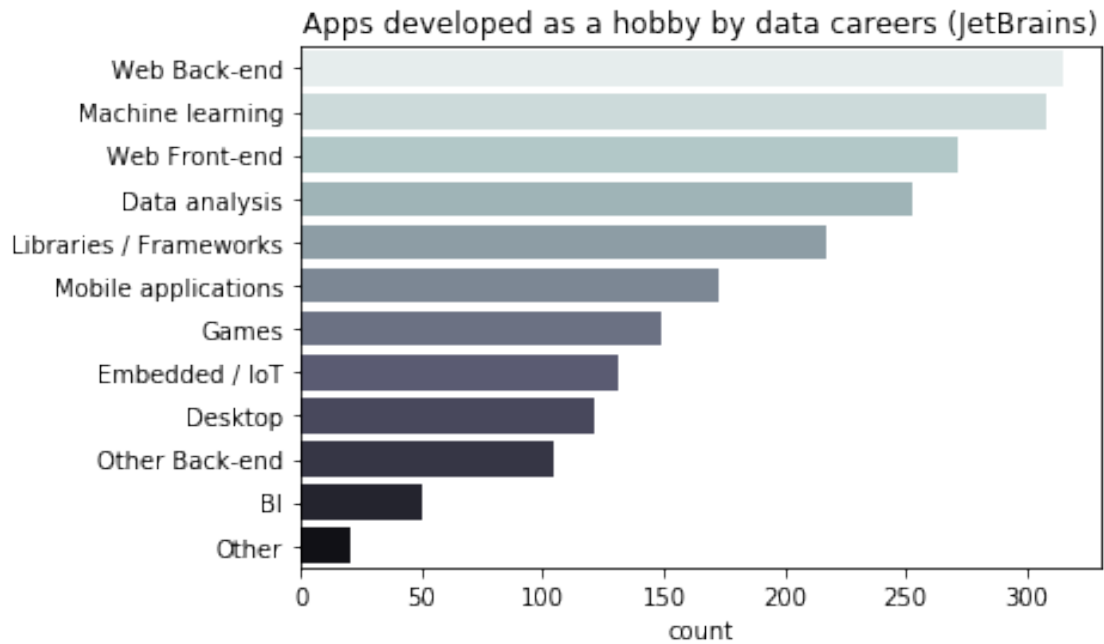
count

```
hcountplotmelt(jb_data.iloc[:, 1570:1577])
plt.title('Time spent per week on a side project by data careers (JetBrains)')
```

```
Text(0.5, 1.0, 'Time spent per week on a side project by data careers
(JetBrains)')
```

Time spent per week on a side project by data careers (JetBrains)

3-8 hours a week
9-16 hours a week
1-2 hours a week
17-32 hours a week
Less than 1 hour a week
I don't have a side project
32 hours a week or more
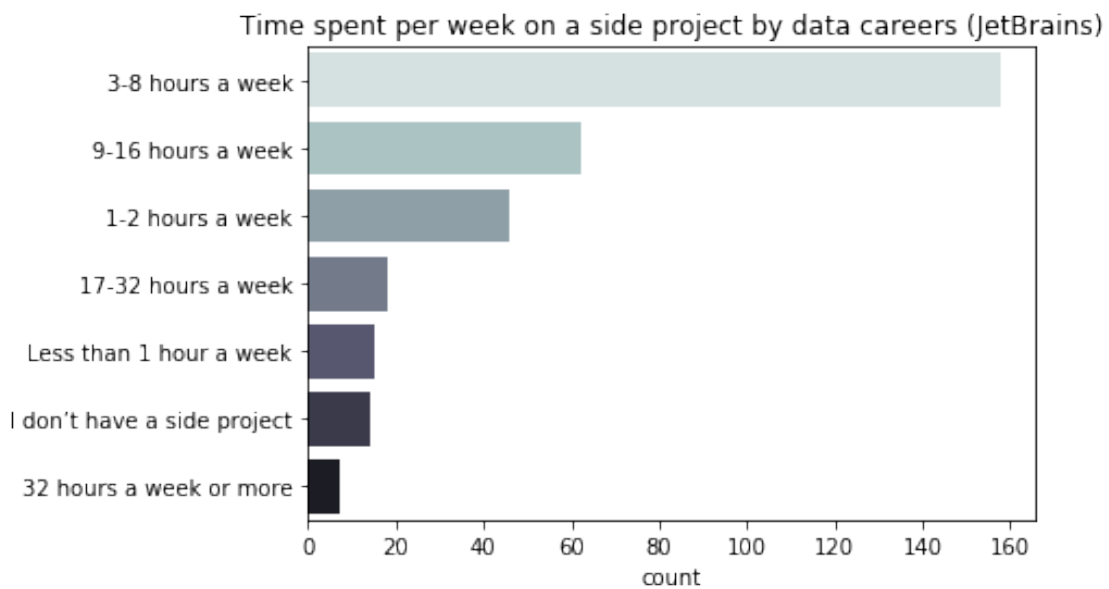
count

```
hcountplotmeltlimit(jb_data.iloc[:, 97:134], 10)
plt.title('Programming languages currently being used in data careers␣
 ↪(JetBrains)')
```

```
Text(0.5, 1.0, 'Programming languages currently being used in data careers
(JetBrains)')
```


Programming languages currently being used in data careers (JetBrains)
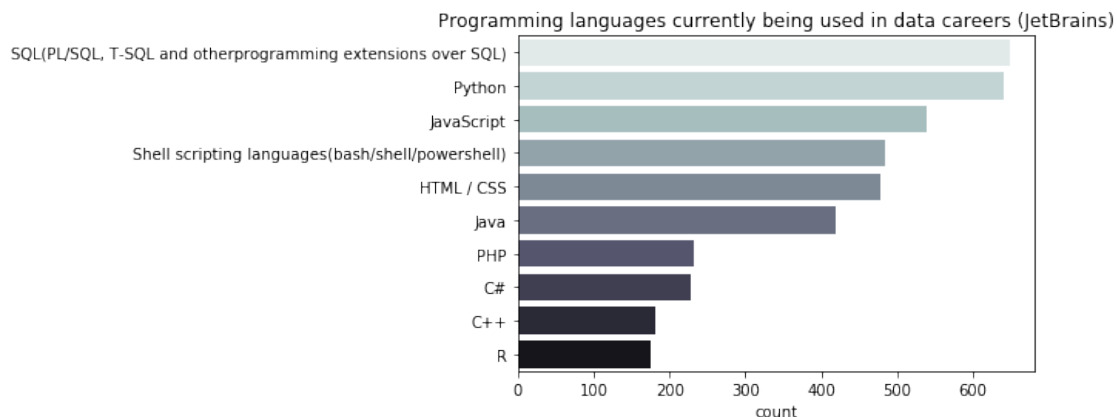
Added limit because otherwise graph becomes unwieldy, focus on most common.

```
hcountplotmeltlimit(jb_data.iloc[:, 134:170], 10)
plt.title('Primary programming language used in data careers (JetBrains)')
```

```
Text(0.5, 1.0, 'Primary programming language used in data careers (JetBrains)')
```


Primary programming language used in data careers (JetBrains)
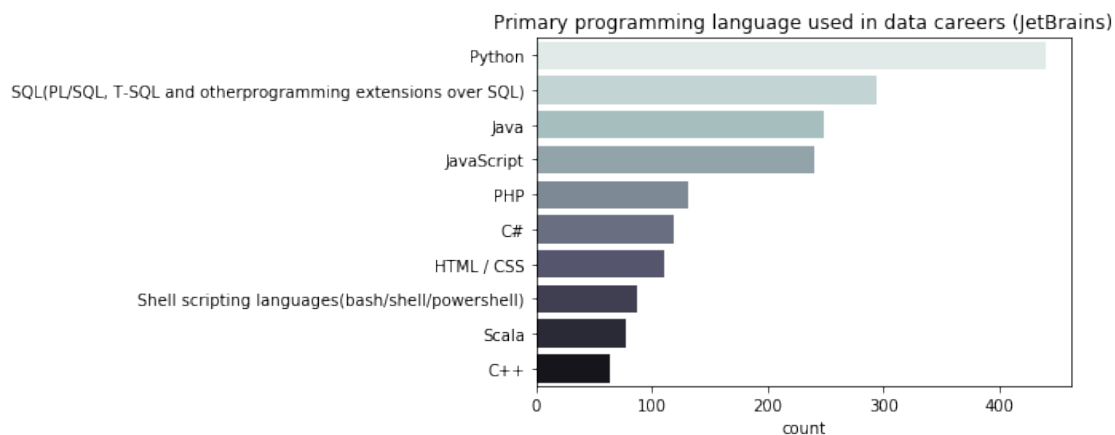
```
hcountplotmeltlimit(jb_data.iloc[:, 1617:1637], 10)
plt.title('Programming languages currently being learned (JetBrains)')
```

[ ]: Text(0.5, 1.0, 'Programming languages currently being learned (JetBrains)')

Programming languages currently being learned (JetBrains)
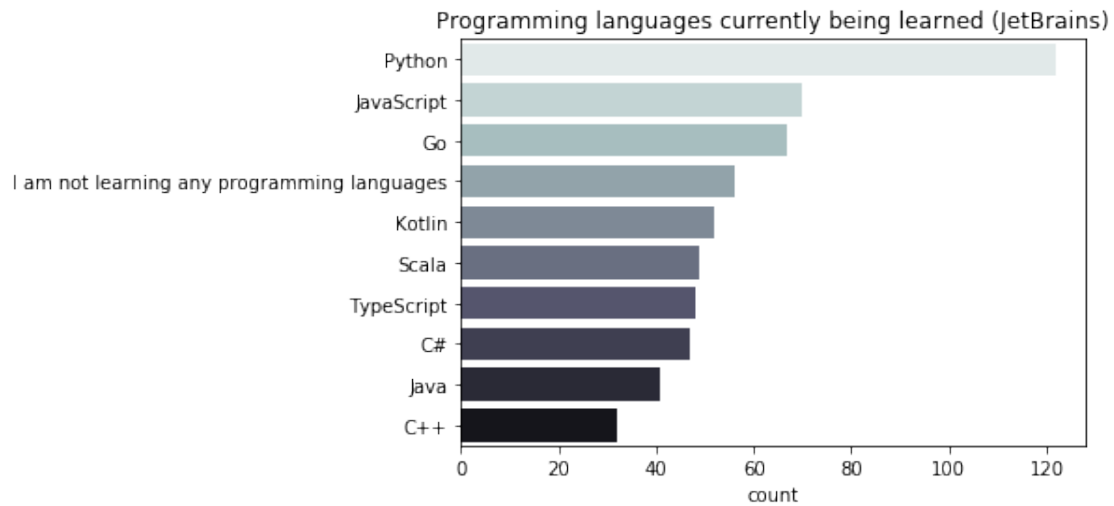
[ ]: ```
hcountplotmelt(jb_data.iloc[:, 1637:1647])
plt.title('Where are data careers preferring to learn new things? (JetBrains)')
```

[ ]: Text(0.5, 1.0, 'Where are data careers preferring to learn new things?
(JetBrains)')



Where are data careers preferring to learn new things? (JetBrains)

[ ]: ```
hcountplot(jb_data.iloc[:,1647])
plt.title('Time Spent Learning (JetBrains)')
```
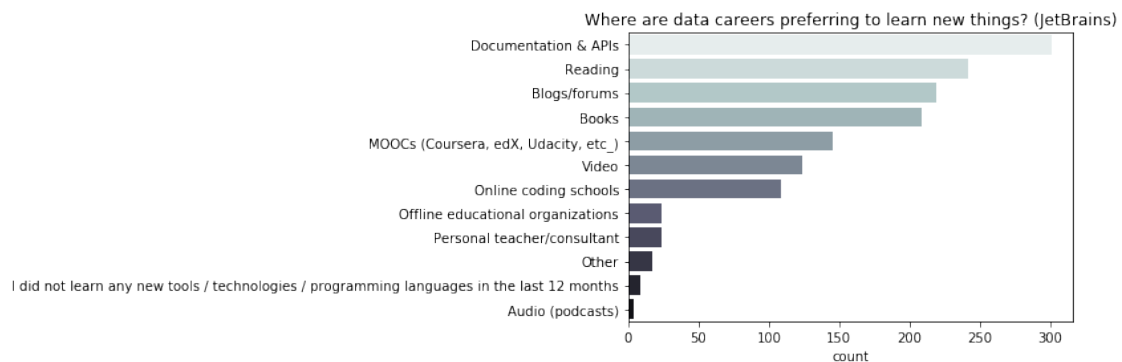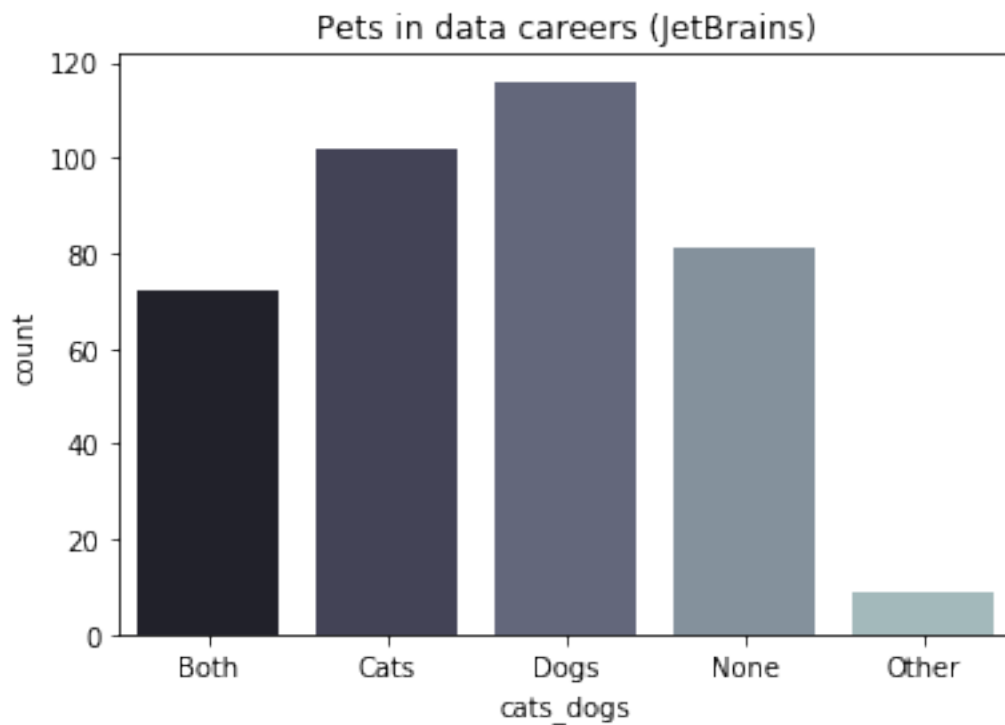
[ ]: Text(0.5, 1.0, 'Time Spent Learning (JetBrains)')

Time Spent Learning (JetBrains)

3 – 8 hours a week	
1 – 2 hours a week	
9 – 16 hours a week	
Less than 1 hour a week	
17 – 32 hours a week	
32 hours a week or more	
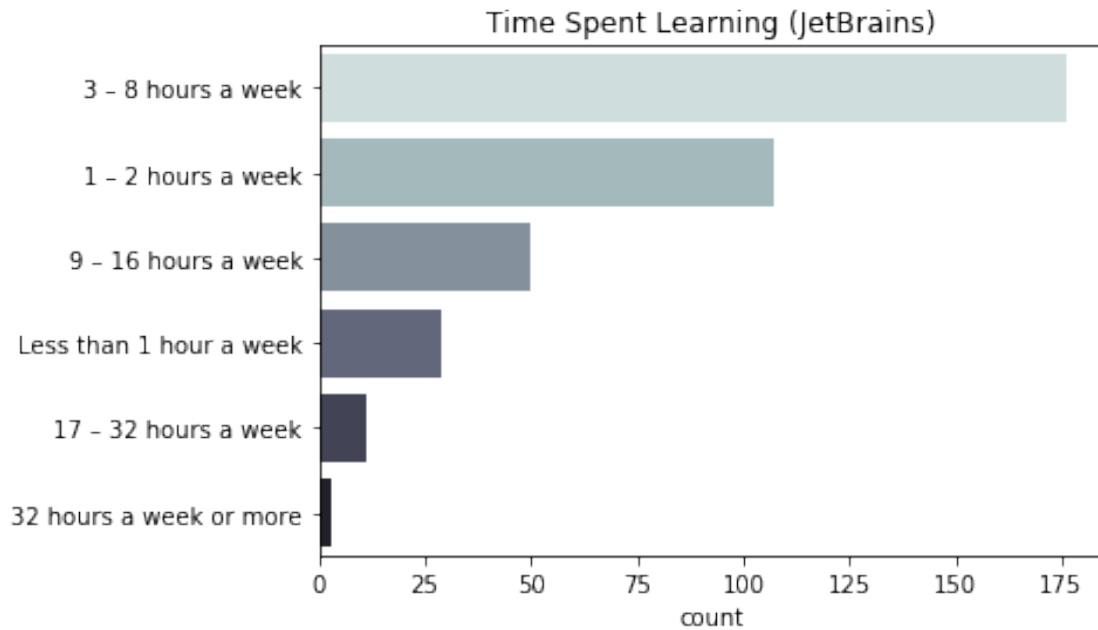
count

```
ax = sns.countplot(jb_data.iloc[:,1648])
plt.title('Pets in data careers (JetBrains)')
```

Text(0.5, 1.0, 'Pets in data careers (JetBrains)')

Pets in data careers (JetBrains)

cats_dogs

```
plt.figure(figsize=(4,4))
countplot(jb_data.iloc[:,1657])
plt.title('Data careers working within IT (JetBrains)')
```

Text(0.5, 1.0, 'Data careers working within IT (JetBrains)')

Data careers working within IT (JetBrains)
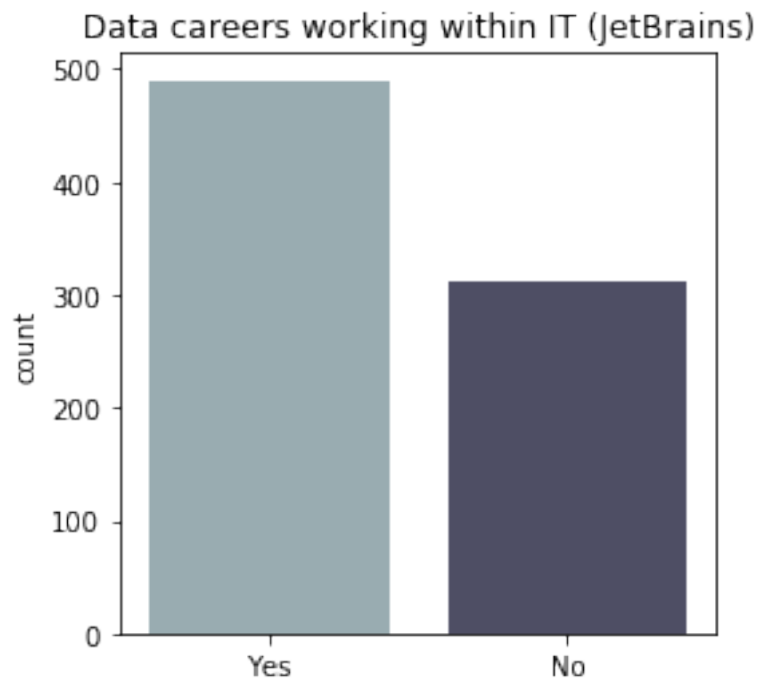
```
hcountplotmelt(jb_data.iloc[:, 1658:1677])
plt.title('Working within IT sectors in data careers (JetBrains)')
```

Text(0.5, 1.0, 'Working within IT sectors in data careers (JetBrains)')

Working within IT sectors in data careers (JetBrains)
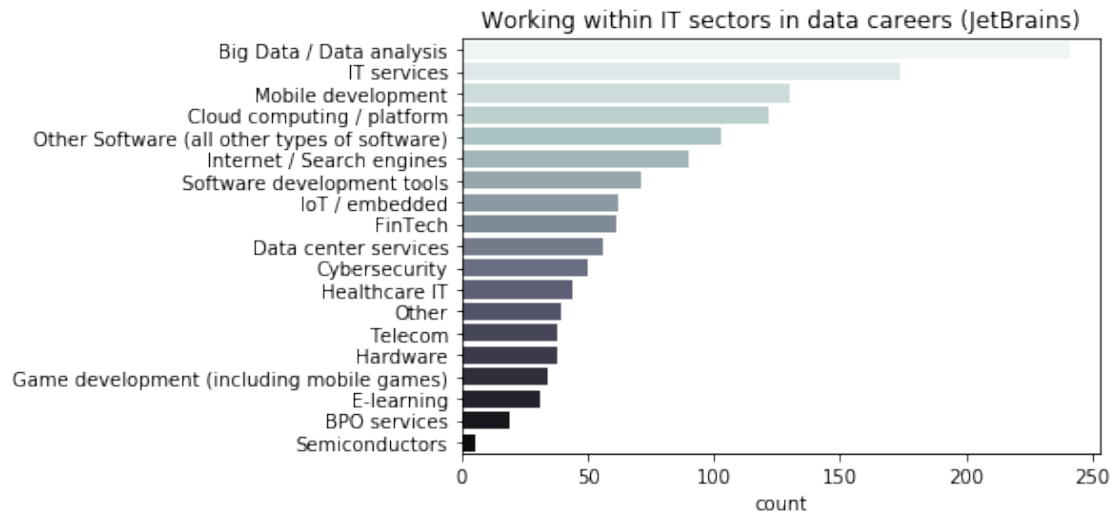

```
plt.figure(figsize=(6,9))
hcountplotmelt(jb_data.iloc[:, 1677:1704])
plt.title('Working outside of IT sectors in data careers (JetBrains)')
```

Text(0.5, 1.0, 'Working outside of IT sectors in data careers (JetBrains)')

Working outside of IT sectors in data careers (JetBrains)
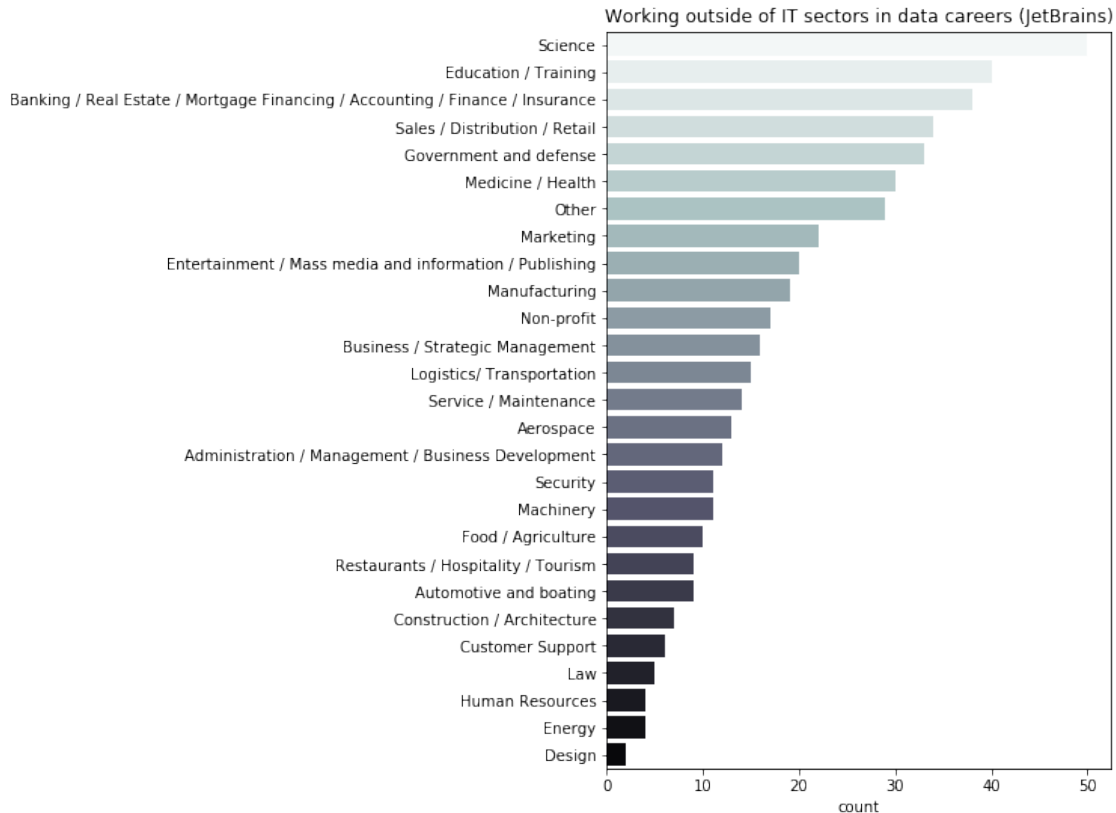
Large graph but I left it because it seems important to show the broad range of different sectors

```
[ ]: hcountplotmelt(jb_data.iloc[:, 1649:1657])
     plt.title('Size of company worked for in data careers (JetBrains)')
```

```
[ ]: Text(0.5, 1.0, 'Size of company worked for in data careers (JetBrains)')
```
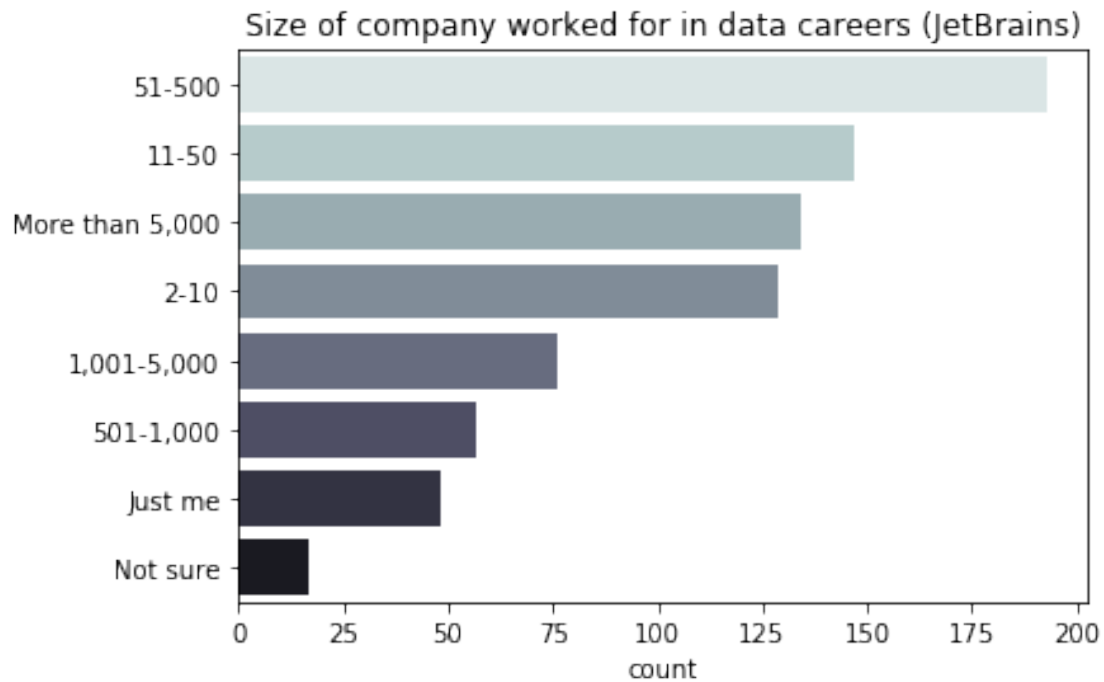


```
[ ]: jb_data_cosize = pd.melt(jb_data.iloc[:, 1649:1657])
     ax = sns.countplot(y=jb_data_cosize['value'], palette="bone_r")
     plt.title('Size of company worked for in data careers (JetBrains)')
     ax.set(xlabel='count', ylabel='')
```
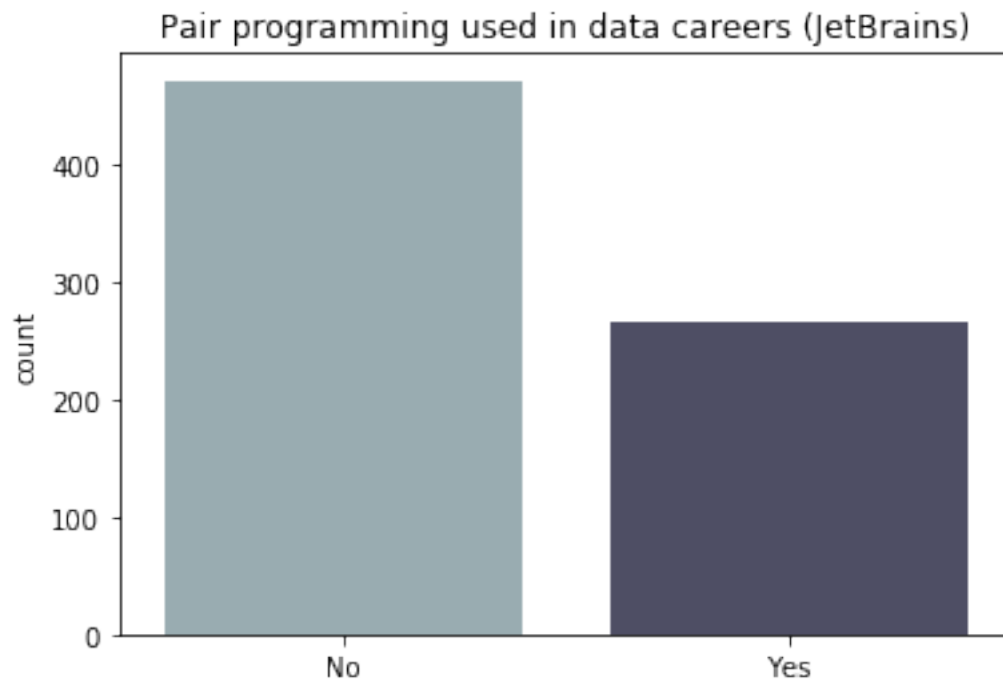
```
[ ]: [Text(0, 0.5, ''), Text(0.5, 0, 'count')]
```

Size of company worked for in data careers (JetBrains)
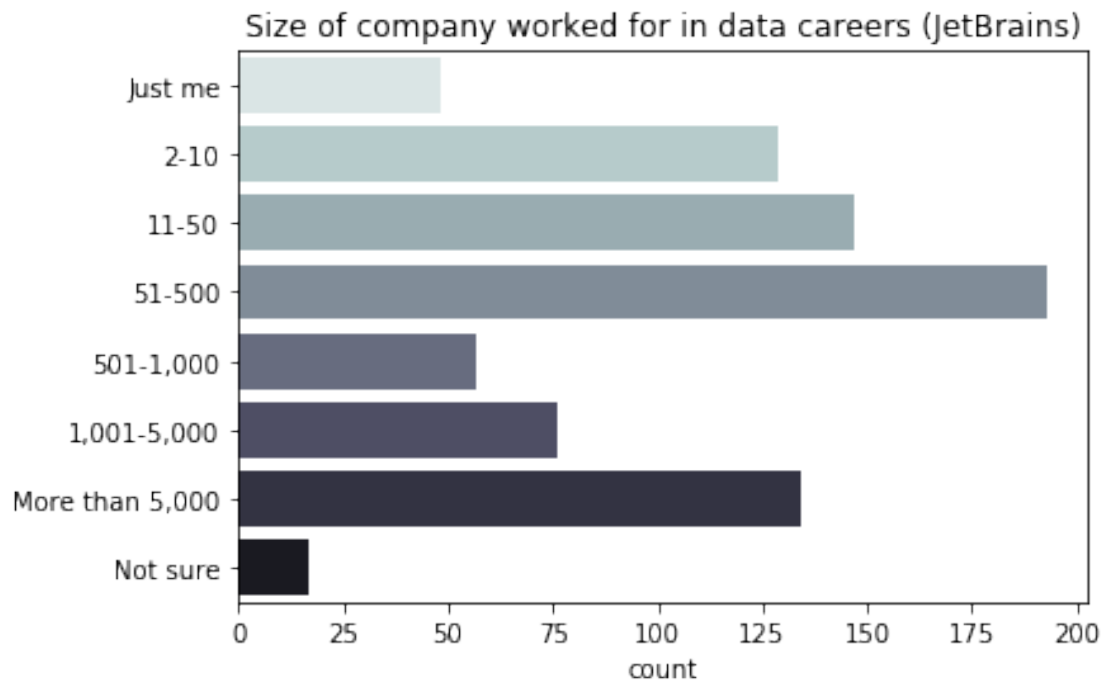
```
ax = sns.countplot(jb_data.iloc[:,1720], palette='bone_r')
plt.title('Pair programming used in data careers (JetBrains)')
ax.set(ylabel='count', xlabel='')
```
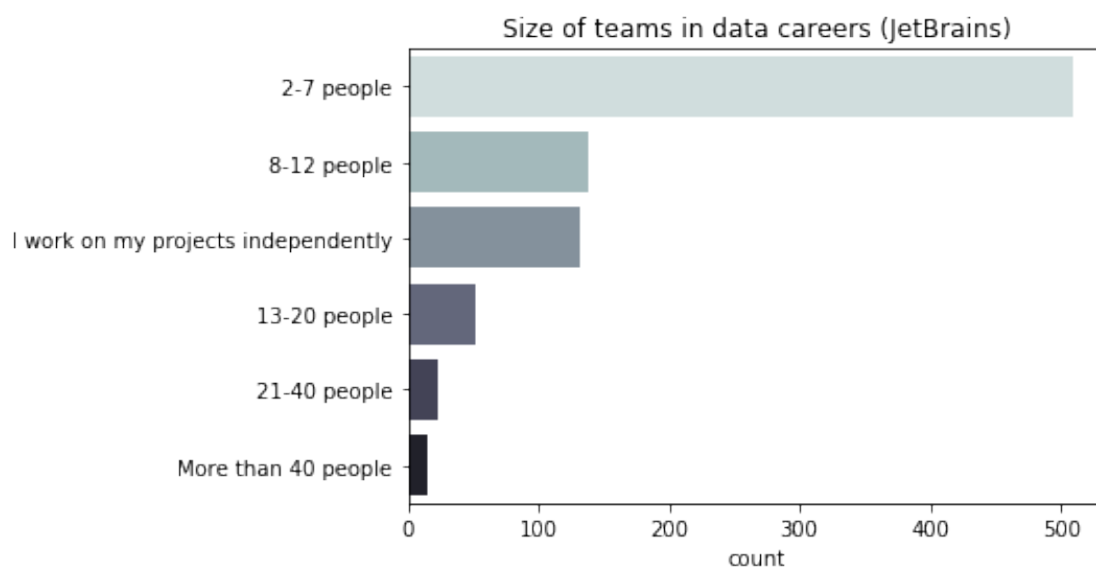
```
[Text(0, 0.5, 'count'), Text(0.5, 0, '')]
```

Pair programming used in data careers (JetBrains)


```
hcountplot(jb_data.iloc[:,1713])
plt.title('Size of teams in data careers (JetBrains)')
```

Text(0.5, 1.0, 'Size of teams in data careers (JetBrains)')

```
[ ]: jb_data_age = pd.melt(jb_data.iloc[:, 1729:1736])
     ax = sns.countplot(jb_data_age['value'], palette="bone_r")
     plt.title('Age of those working data careers (JetBrains)')
     ax.set(ylabel='count', xlabel='')
```

```
[ ]: [Text(0, 0.5, 'count'), Text(0.5, 0, '')]
```

Age of those working data careers (JetBrains)

Can't view age in a distplot like the others, but can see that it still lines up similarly to the other sources.

JetBrains data is primarily about which jetbrains software is used, not a lot of demographic information.

These surveys are very in-depth and offer lots of interesting conclusions. For the purpose of this project, different datasets might be more helpful. While there is something to be said for passively gaining demographics from the surveys on these sites, it does not seem to provide a very full picture. Some of our responses, such as different bootcamps, had only a few hits for each category, which is not very strong. In future, it might be interesting to go to different companies and view their stats on their employees. This would also help with the issue from New Coders, where there is only so far we can use that data, as most respondents have just started or not even started in the field, so their experience is not as helpful for others starting out.

Overall, we can see that while there are a few standards (white, male, 20s-30s), there are exceptions to almost everything. It seems that different genders and ethnicities are being recognized, and we can see that coding is something people can do at almost any age. There are lots of different methods and roads to get to a data career, but the information here at least shows what the

industry is primarily expecting from someone looking to join the ranks.