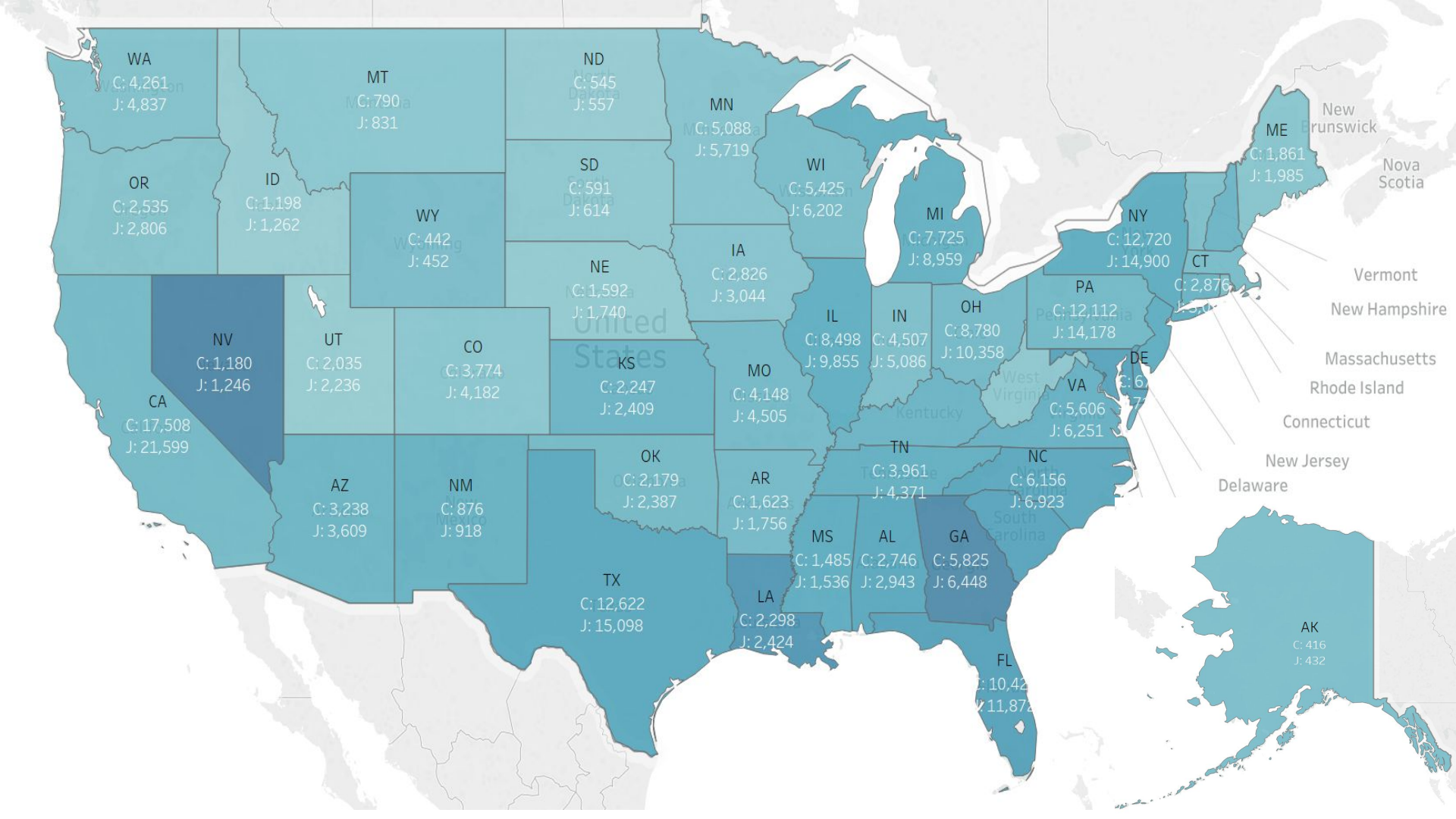
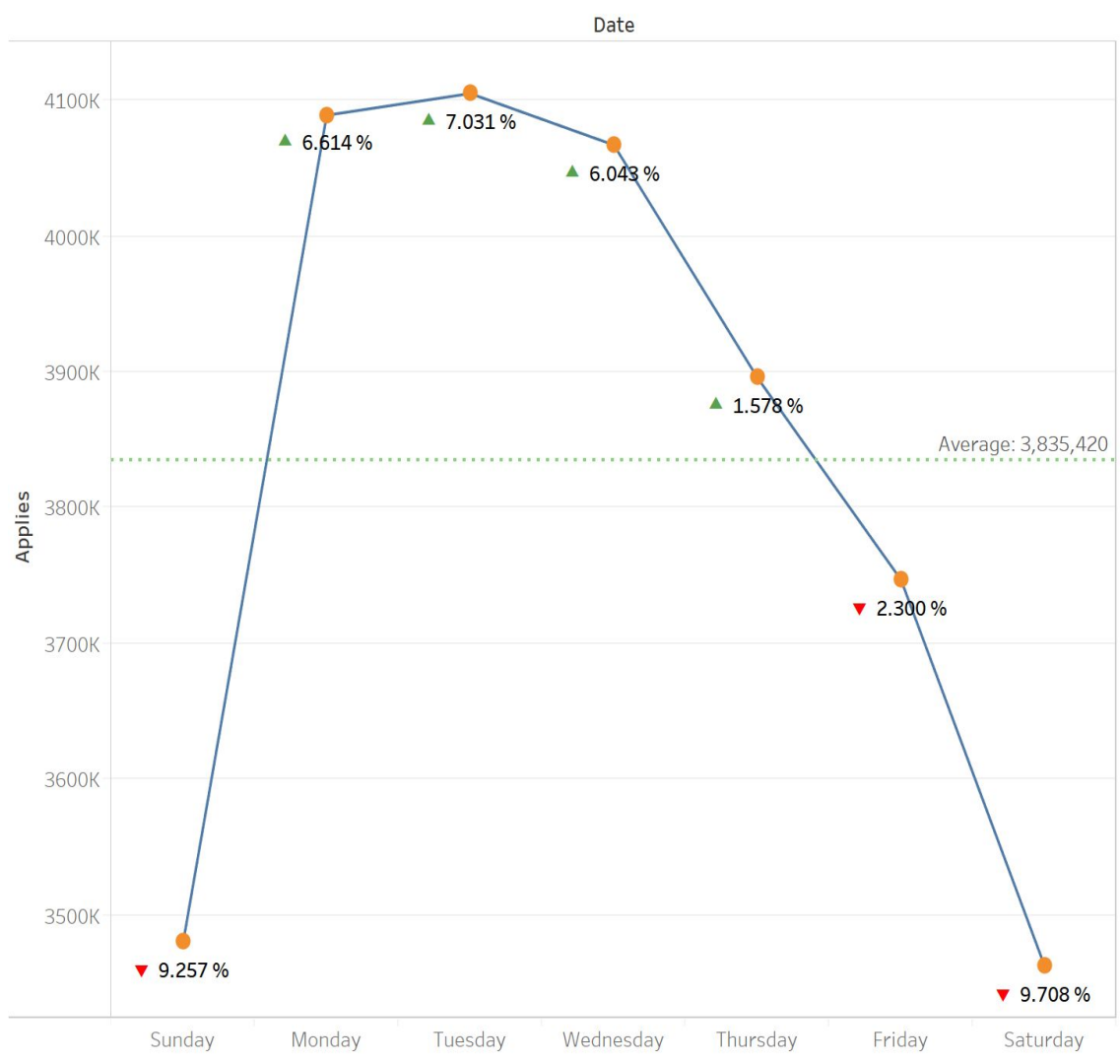
B-PALs


engcivil
engelectric
transport
therapy
socialscience
sanitation
techinfo
project
arts
childcare
pharmacy
aviation
driver
meddental
medinfo
service
medtech
warehouse
mednurse
meddr
insurance
education
customer
science
manufacturing
math
install
management
hr
admin
tech
arch
mining
engmech
military
care
accounting
sales
techsoftware
retail
legal
automotive
uncategorized
analyst
engchem
techhelp
finance
construction
food
agriculture
hospitality
engid
sports
marketing
protective
realestate
media
veterinary
personal


WA
C: 4,261
J: 4,837
OR
C: 2,535
J: 2,806
CA
C: 17,508
J: 21,599
NV
C: 1,180
J: 1,246
ID
C: 1,198
J: 1,262
MT
C: 790
J: 831
WY
C: 442
J: 452
UT
C: 2,035
J: 2,236
AZ
C: 3,238
J: 3,609
CO
C: 3,774
J: 4,182
NM
C: 876
J: 918
ND
C: 545
J: 557
SD
C: 591
J: 614
NE
C: 1,592
J: 1,740
KS
C: 2,247
J: 2,409
OK
C: 2,179
J: 2,387
TX
C: 12,622
J: 15,098
MN
C: 5,088
J: 5,719
IA
C: 2,826
J: 3,044
MO
C: 4,148
J: 4,505
AR
C: 1,623
J: 1,756
LA
C: 2,298
J: 2,424
WI
C: 5,425
J: 6,202
IL
C: 8,498
J: 9,855
MS
C: 1,485
J: 1,536
MI
C: 7,725
J: 8,959
IN
C: 4,507
J: 5,086
OH
C: 8,780
J: 10,358
KY
TN
C: 3,961
J: 4,371
AL
C: 2,746
J: 2,943
GA
C: 5,825
J: 6,448
FL
NY
C: 12,720
J: 14,900
PA
C: 12,112
J: 14,178
WV
VA
C: 5,606
J: 6,251
NC
C: 6,156
J: 6,923
SC
DE
ME
C: 1,861
J: 1,985
CT
C: 2,876
AK
C: 416
J: 432
New Brunswick
Nova Scotia
Vermont
New Hampshire
Massachusetts
Rhode Island
Connecticut
New Jersey
Delaware



July
Applies: 1,645,627
Job Postings: 40,495
(40.64)

August
Applies: 1,722,251
Job Postings: 34,617
(49.75)

May
Applies: 1,939,075
Job Postings: 33,546
(57.80)

October
Applies: 1,895,309
Job Postings: 32,783
(57.81)

April
Applies: 1,956,782
Job Postings: 32,484
(60.24)

March
Applies: 2,137,600
Job Postings: 31,262
(68.38)

November
Applies: 1,803,384
Job Postings: 30,930
(58.31)

September
Applies: 1,731,064
Job Postings: 32,259
(53.66)

December
Applies: 1,825,352
Job Postings: 28,294
(64.51)

February
Applies: 1,955,352
Job Postings: 27,562
(70.94)

June
Applies: 1,552,866
Job Postings: 32,241
(48.16)

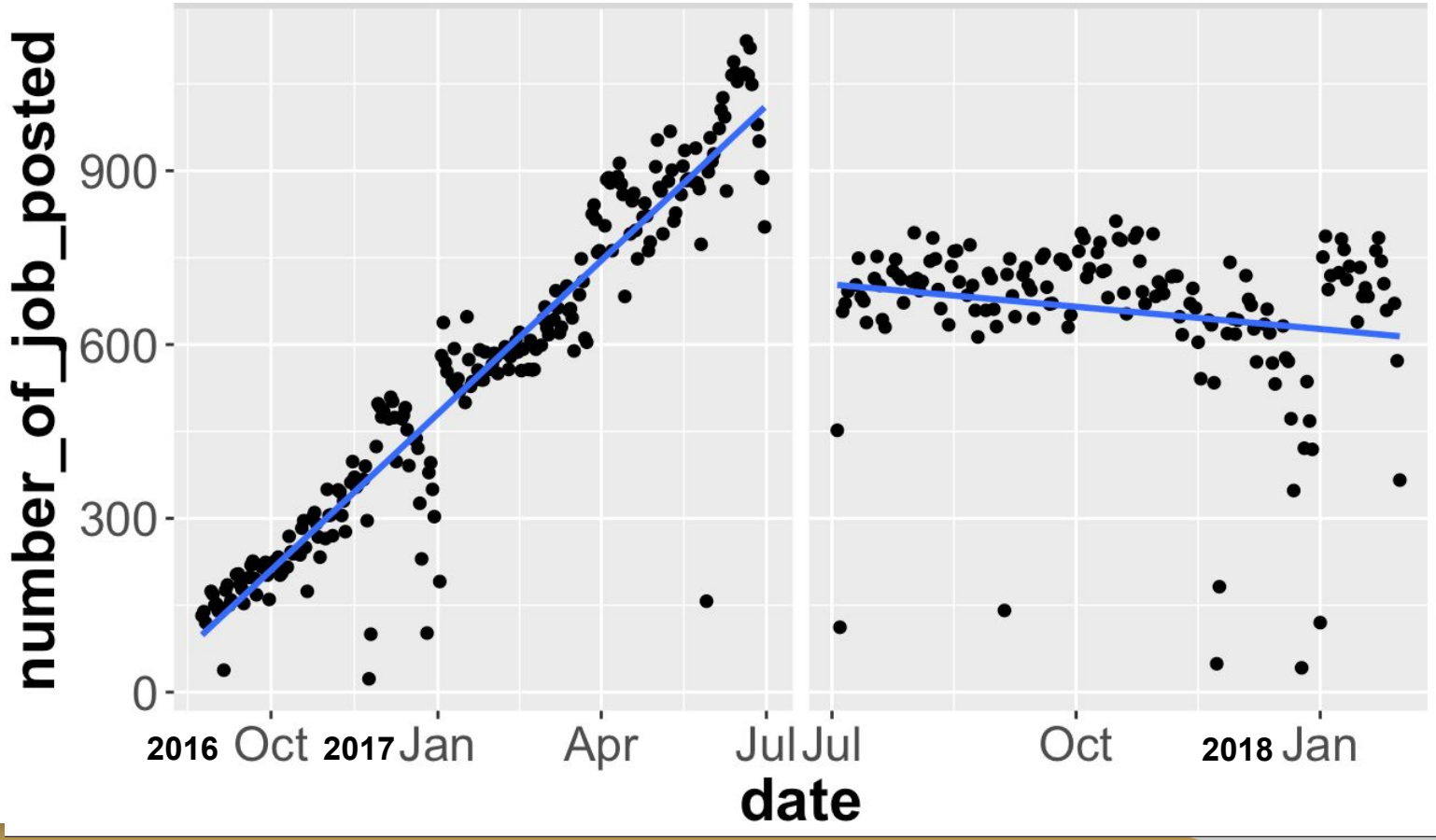
January
Applies: 2,248,787
Job Postings: 27,663
(81.29)


Description Length Chars
30
2,000
4,000
6,000
8,000
≥ 10,000
Jobagedays
0
99
No Education Requirements Job
0
1
Applies
Cand Status Reviewed Count
0
500
1000
1500
2000
2500
3000
0K
1K
2K
3K
4K
5K
6K
senior salesperson
50.94 %
passenger service agent
51.76 %
veterinary receptionist
43.88 %
maintenance crew
54.16 %
primary care physician
39.59 %
hvac supervisor
56.13 %
receptionist
27.90 %
customer service representative
83.00 %
industrial engineer
72.08 %
crew leader ii
99.26 %
editor
91.30 %
front desk agent
28.64 %
journeyman plumber
41.32 %
senior office manager
25.36 %
security agent
63.94 %
senior service administrator
22.34 %
senior finance associate
66.52 %
promoter
14.71 %
mailroom clerk
76.61 %
medical receptionist
13.78 %
pool technician
82.16 %
junior office manager
15.78 %
adjunct instructor
11.75 %
administrative director
78.93 %
residential counselor
92.04 %
researcher
92.16 %
bi architect
95.69 %

Insight on Job Openings @indeed.com

By: Ruby Ru, Carol Liu, Rebecca Wang, Elaona Lemoto, and Starry Zhou

Fitted Model for Number of Jobs Posted Over Time



Percent of Required Education

“35 percent of the job openings will require at least a bachelor’s degree” ---Georgetown Center on Education and the Workforce

But...

Only 0.6% jobs on indeed requires a higher education

Why?

Conclusion

Based on our data, while there was a definite change in our first regression model, it does show a decrease in job postings.

Here is our suggestion for Indeed.com:

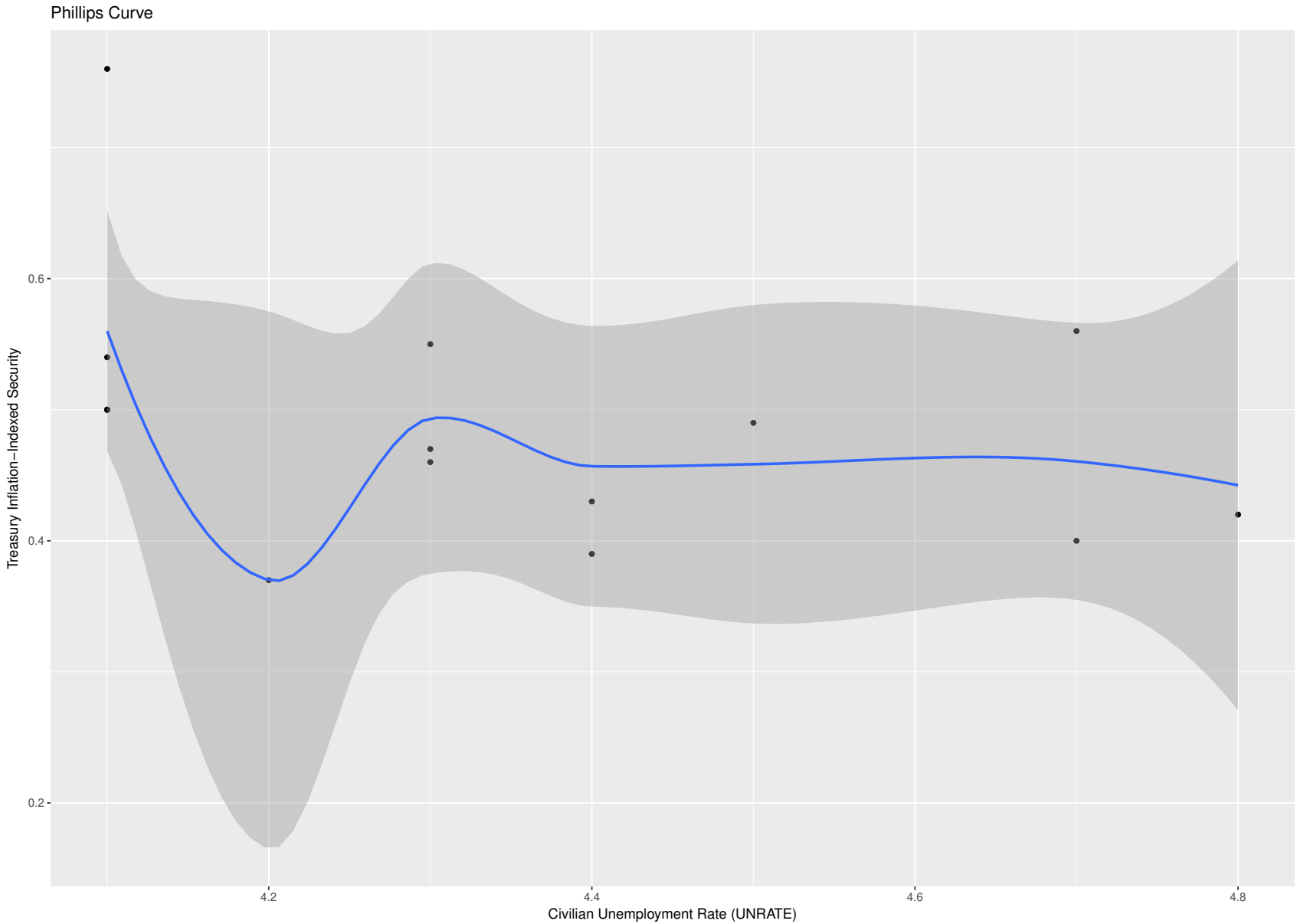
- Use required fields for data input
  - For example, education level...

Team Flannels and Denim DataFest 2018

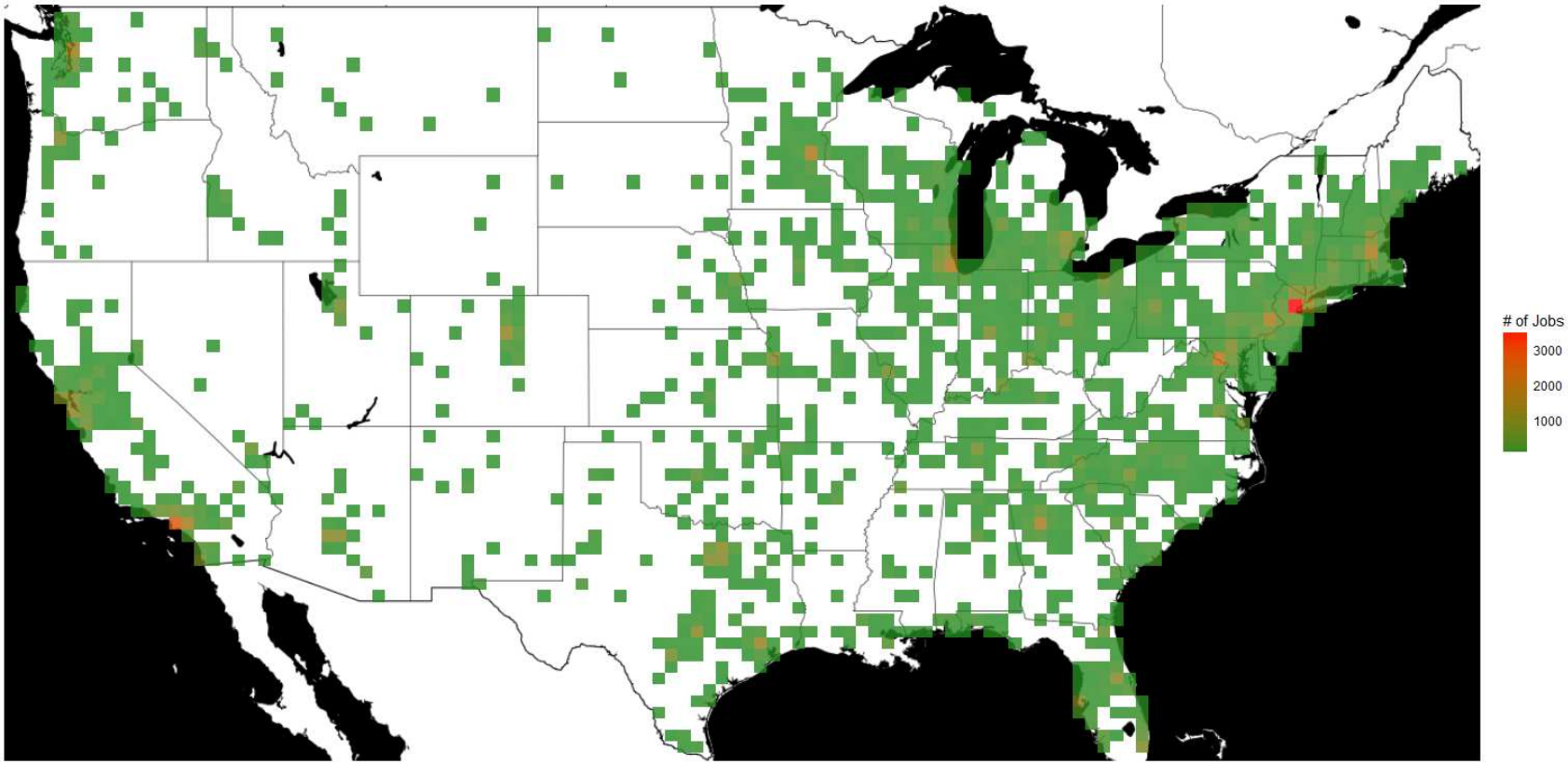
Scott Cohn, Chester Moses, Dennis Hofmann, Gurudeep Machupalli, Dan Brickell

Literature Review

```
## `geom_smooth()` using method = 'loess'
```



Job Geographical Density Heatmap



Analysis

	Estimate	Std. Error	t value	Pr
(Intercept)	1.4032439	1.7444137	0.8044215	0.42
UNRATE	-0.0946149	0.3347105	-0.2826767	0.77
DFII10	0.3758932	1.4897164	0.2523253	0.80
PAYEMS	-0.0638996	2.2376511	-0.0285566	0.97
PCEPILFE	-0.4172372	0.9719095	-0.4292963	0.66
PCU3115203115200_PCH	-0.0838965	0.1817353	-0.4616409	0.64

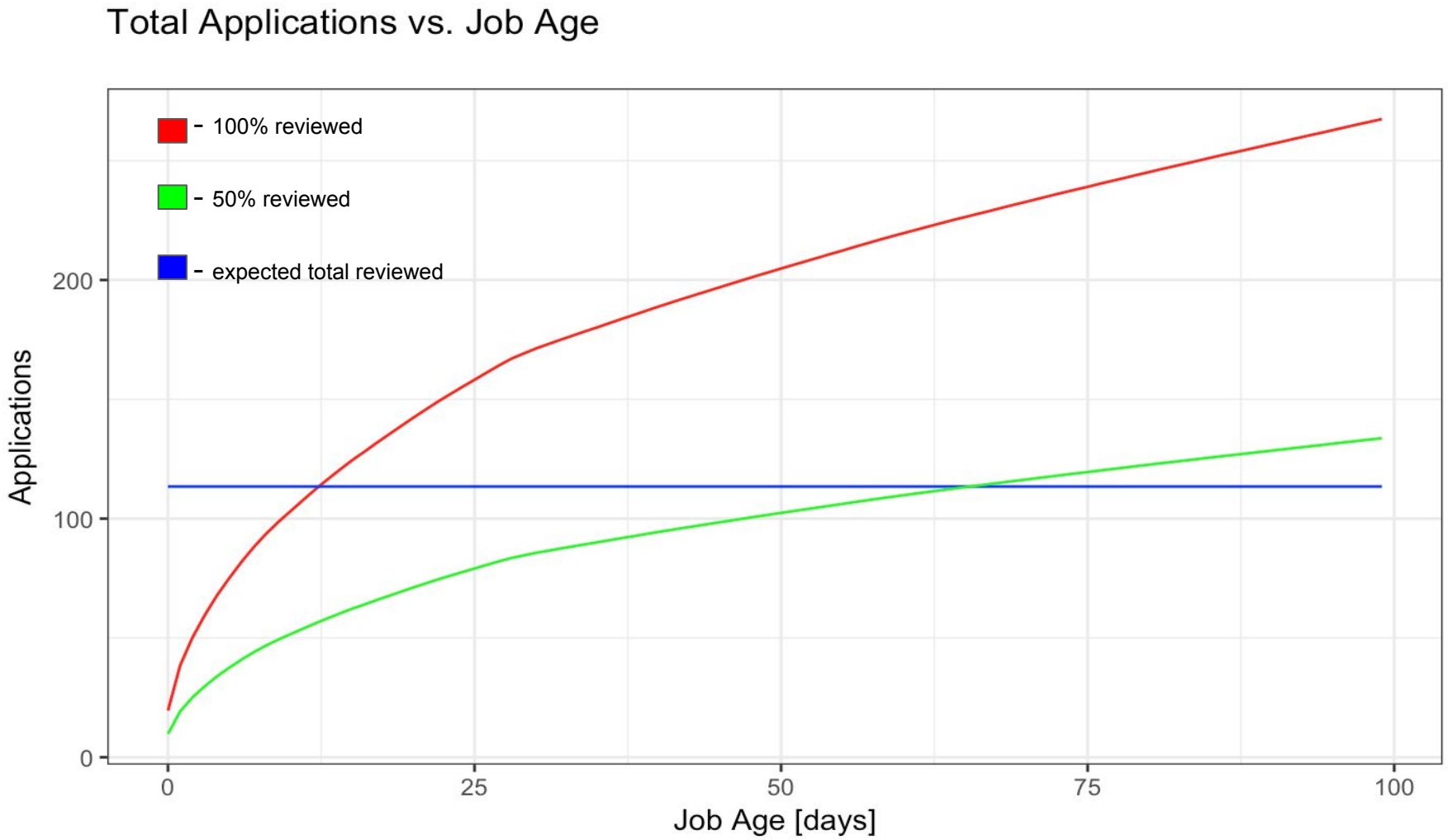
Applicant Fitness and Job Application Deadlines

A presentation by the Standard Deviations
Fred Coburn and Nischal Dave

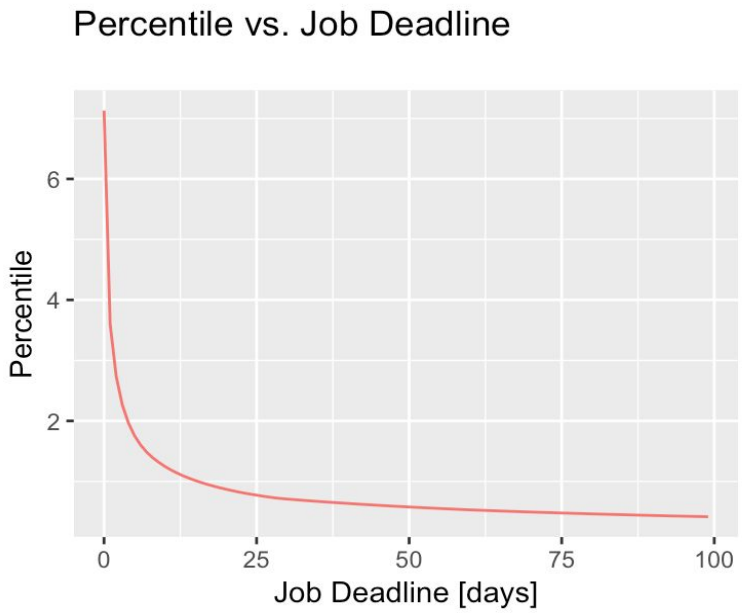
Purpose and Assumptions of Model

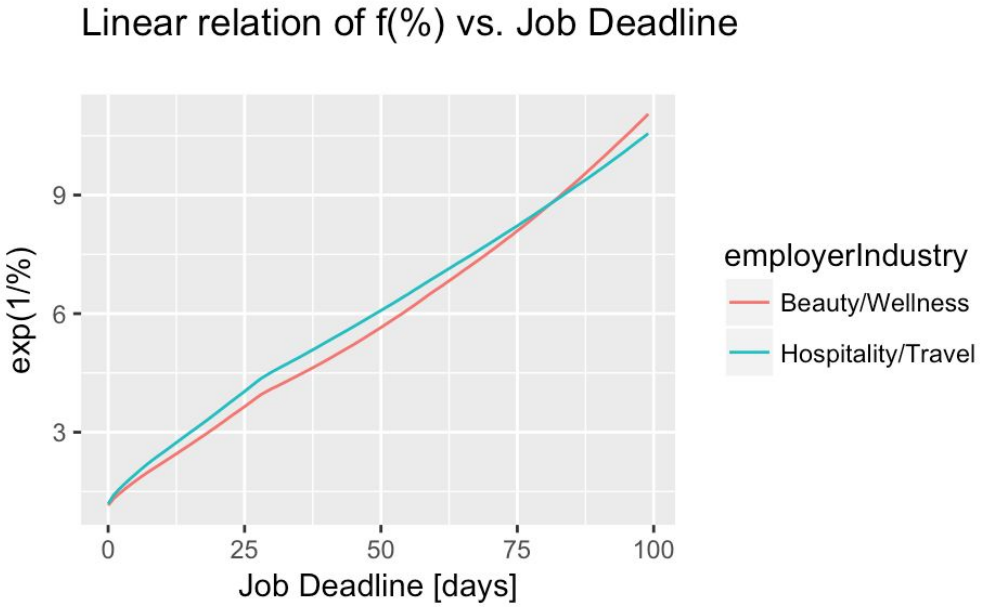
- Who benefits from categorizing job applicant fitness?
  - Job Seeker
  - Hiring Managers
  - Indeed
- Who benefits from categorizing deadlines?
  - Job Seeker
  - Hiring Managers
  - Indeed

- What is our method?
  - Assume hiring managers hire on rolling basis
  - Aggregate indeed data by specified parameters to categorize job
    - Company
    - Industry
    - Etc.
  - Find relationship between applicant fitness and job application deadline using:
    - Expected # Reviews by Employer
    - Job Age
    - Cumulative Job Applications


Total Applications vs. Job Age
100% reviewed
50% reviewed
expected total reviewed
Applications
200
100
0
0
25
50
75
100
Job Age [days]

Mapping Percentile and Deadline





TR = % * CA(DF)
% = TR/CA(DF)

R = Expected total reviews
% = Minimum percentile of applicant
CA = Cumulative applications received
DF = Expected age of job when filled

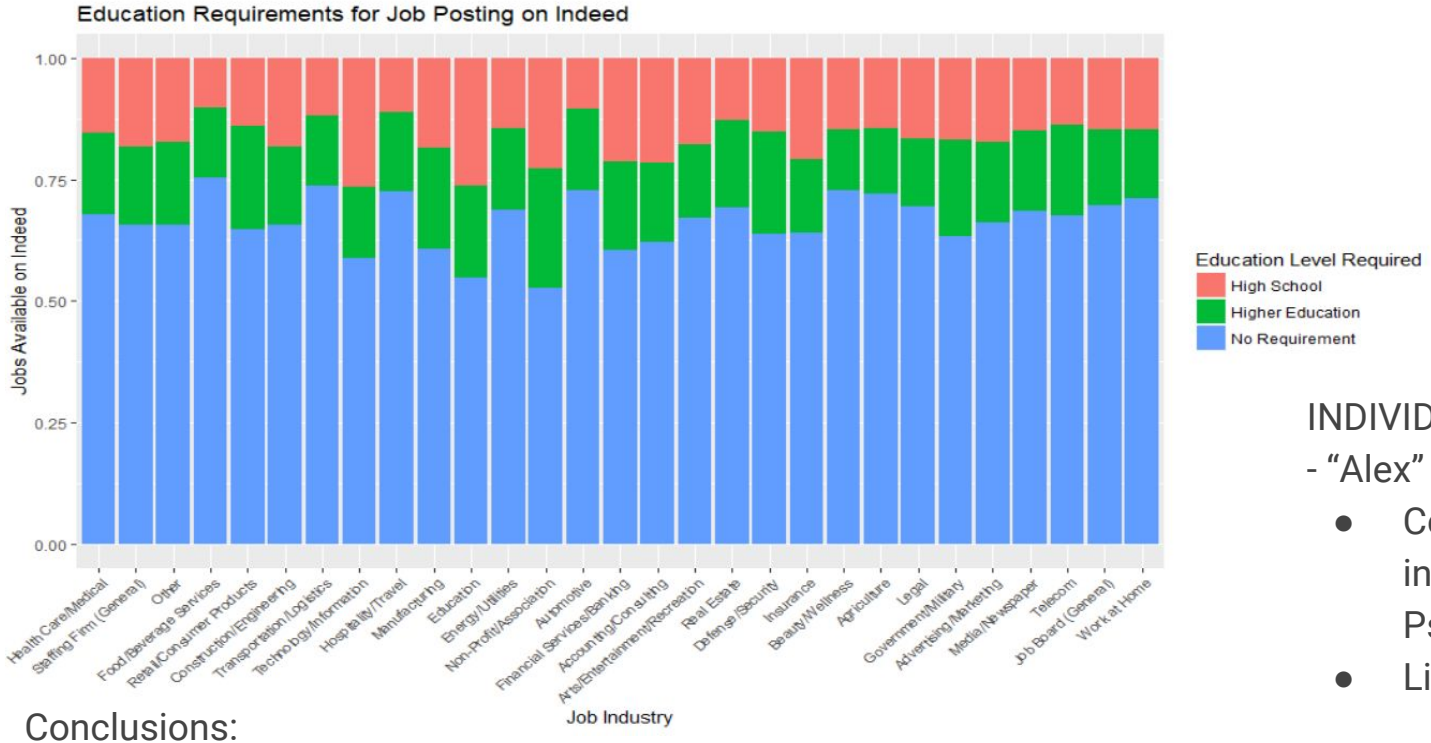
DF = K*e^(1/%) +C

Team R-Some DataFest 2018

Karina Lieb, Olivia Baldwin, Rocio Jaime, and Alexis Kilayko

- Our angle: Guiding US users through the job-finding process using Indeed, including:
  - What industries have the highest proportion of postings for their given education level (target optimal INDUSTRY)
  - Industries with the most job opportunities in each US state (target optimal GEOGRAPHY)
  - How other users are using Indeed, giving insight to: (target optimal WEBSITE USAGE)
    - Industry competitiveness
    - Day-to-day number of job postings by industry
    - The best time to search for a job on Indeed
- GOAL: To help the INDIVIDUAL use Indeed in the most customized, efficient way!
  - Recommendations on how to best find a job for any jobseeker (using Indeed, of course :D)

Targeting Optimal INDUSTRY (for an individual's education level)



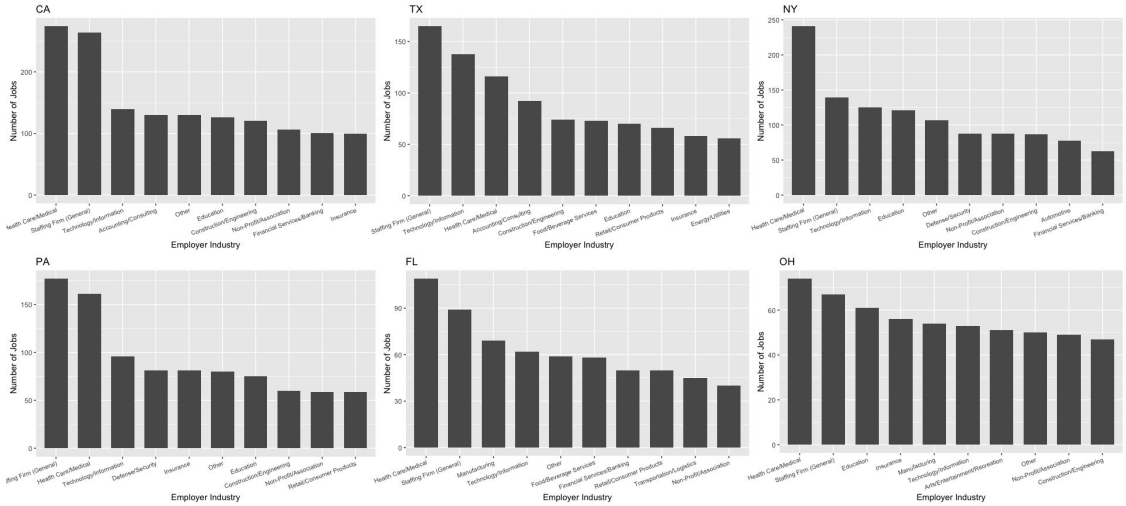
Conclusions:

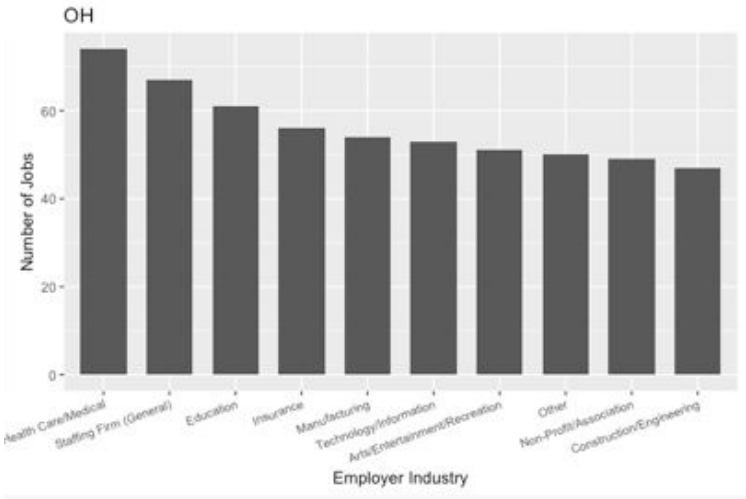
- Alex will choose Education
- See which industry has has the highest proportion of postings for given education level

INDIVIDUAL sample customer - "Alex"

- College diploma, major in Mathematics and Psychology
- Lives in Florida

Targeting Optimal GEOGRAPHY (US state)



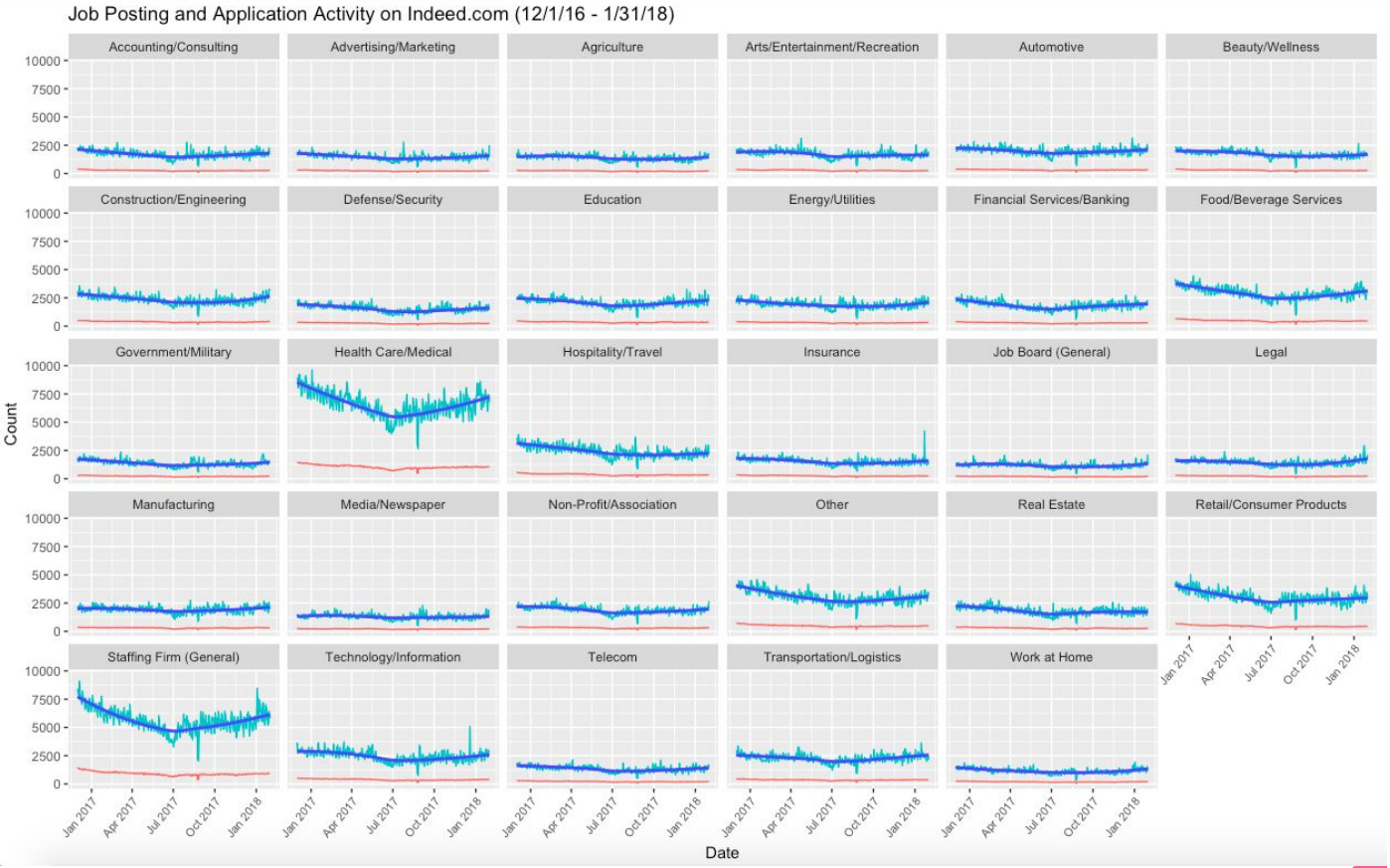


- 6 states shown are the states with the most overall jobs
- Industries shown are the 10 industries with most job postings in that state
- **Jobs that require an education level higher than individual's are filtered out (shown graphs are for jobs that require higher education or lower (Alex))**

Conclusions:

- Alex will optimally move from Florida to Ohio
- Shows most popular industries in states with the most overall jobs, customized for individual education level

Targeting Optimal WEBSITE USAGE (Indeed.com)



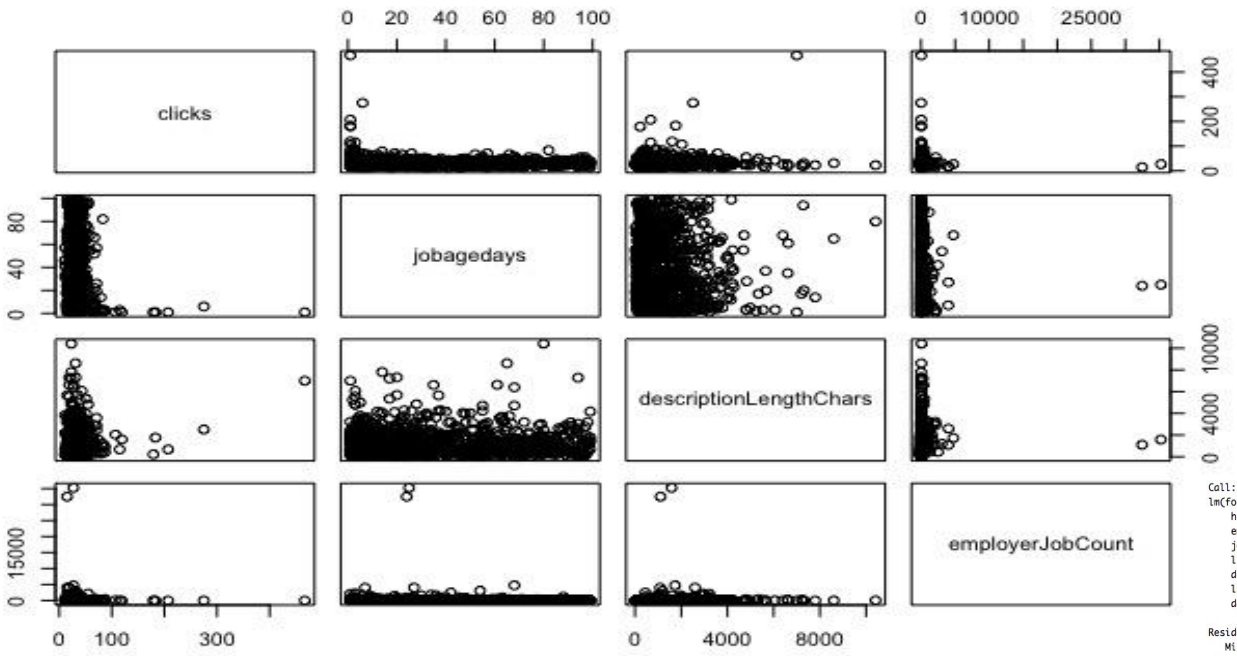
- Darker blue line is best fit line

Conclusions:

- Posting “volatility”
- Competitiveness
- Times when Indeed has most postings
- Number of overall jobs in each industry
- Alex: education, low number of jobs and applicants generally low volatility
- Other fields have an optimal time of year to apply

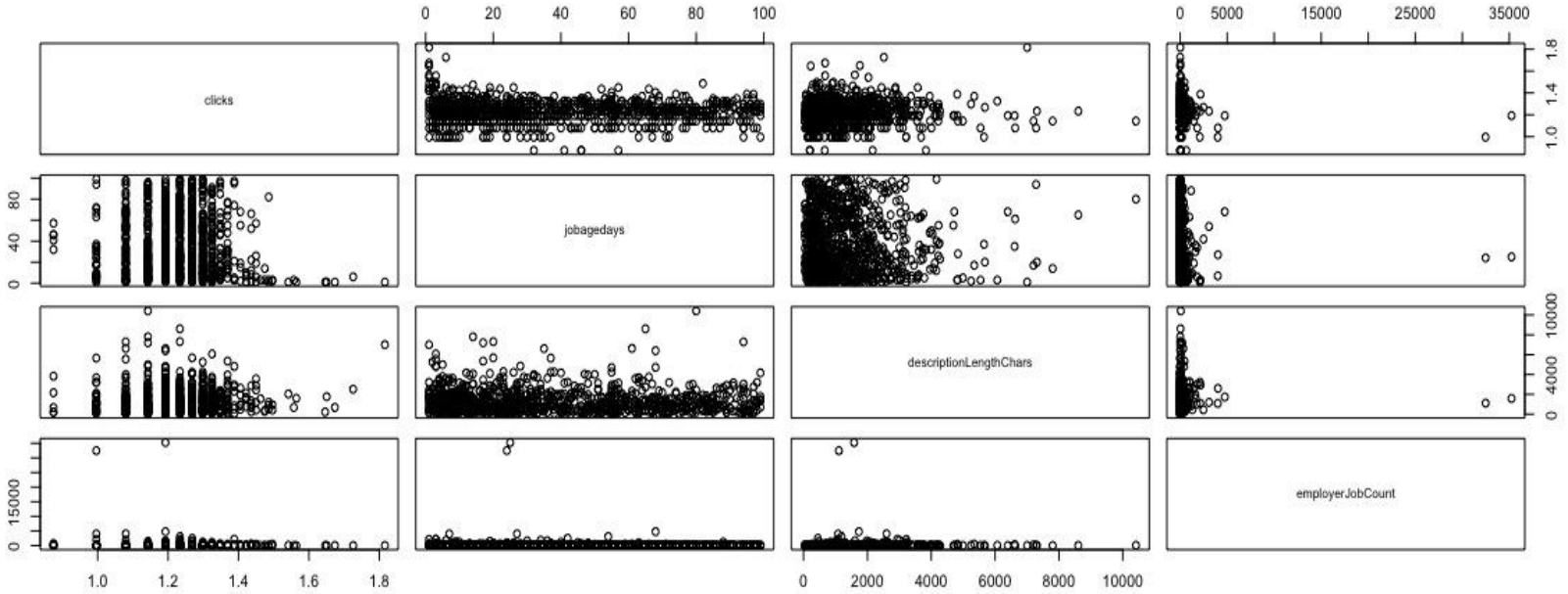
Data out of Data

Presented by: Penta-1
Mount Holyoke College
Holly Hong, Mengyao Xu, Murphy Lu, Xinyue Wang, Younghoo Cho



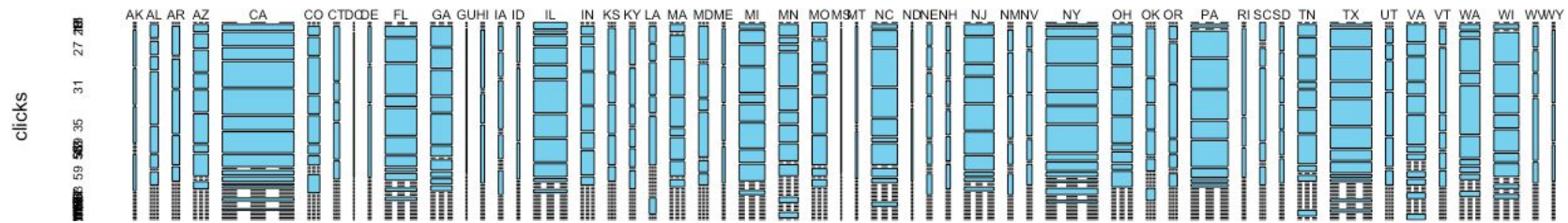
Adjusted R squared =0.01403

```
Call:
lm(formula = clicks ~ jobagedays + descriptionLengthChars + licenseRequiredJob +
    highSchoolEducationRequirementsJob + higherEducationRequirementsJob +
    employerJobCount + jobagedays:higherEducationRequirementsJob +
    jobagedays:highSchoolEducationRequirementsJob + jobagedays:employerJobCount +
    licenseRequiredJob:employerJobCount + licenseRequiredJob:highSchoolEducationRequirementsJob +
    descriptionLengthChars:highSchoolEducationRequirementsJob +
    licenseRequiredJob:higherEducationRequirementsJob + highSchoolEducationRequirementsJob:employerJobCount,
    data = smalldata1)

Residuals:
   Min     1Q Median     3Q    Max
-38.49 -10.64  -3.37   4.62 723.47

Coefficients: (1 not defined because of singularities)
                                                      Estimate Std. Error t value Pr(>|t|)
(Intercept)                                          3.808e+01  2.052e+00  18.556  < 2e-16 ***
jobagedays                                          -1.465e-01  3.730e-02  -3.929 9.13e-05 ***
descriptionLengthChars                               1.863e-03  8.521e-04   2.187   0.0290 *
licenseRequiredJob                                   4.861e+00  2.147e+01   0.226   0.8209
highSchoolEducationRequirementsJob                   8.889e+01  4.282e+01   2.076   0.0381 *
higherEducationRequirementsJob                      -1.405e+01  2.662e+01  -0.528   0.5980
employerJobCount                                    -1.344e-03  2.926e-03  -0.459   0.6460
jobagedays:higherEducationRequirementsJob            1.686e-01  7.098e-01   0.238   0.8123
jobagedays:highSchoolEducationRequirementsJob        9.422e-01  1.838e+00   0.513   0.6083
jobagedays:employerJobCount                          2.990e-05  1.144e-04   0.262   0.7938
licenseRequiredJob:employerJobCount                 -2.459e-02  5.597e-02  -0.439   0.6605
licenseRequiredJob:highSchoolEducationRequirementsJob -1.703e+01  3.519e+01  -0.484   0.6285
descriptionLengthChars:highSchoolEducationRequirementsJob -2.878e-02  1.673e-02  -1.720   0.0858 .
licenseRequiredJob:higherEducationRequirementsJob           NA         NA      NA       NA
highSchoolEducationRequirementsJob:employerJobCount -6.697e-02  4.057e-02  -1.651   0.0991 .
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 32.67 on 986 degrees of freedom
Multiple R-squared:  0.02686,   Adjusted R-squared:  0.01403
F-statistic: 2.093 on 13 and 986 DF,  p-value: 0.01246
```

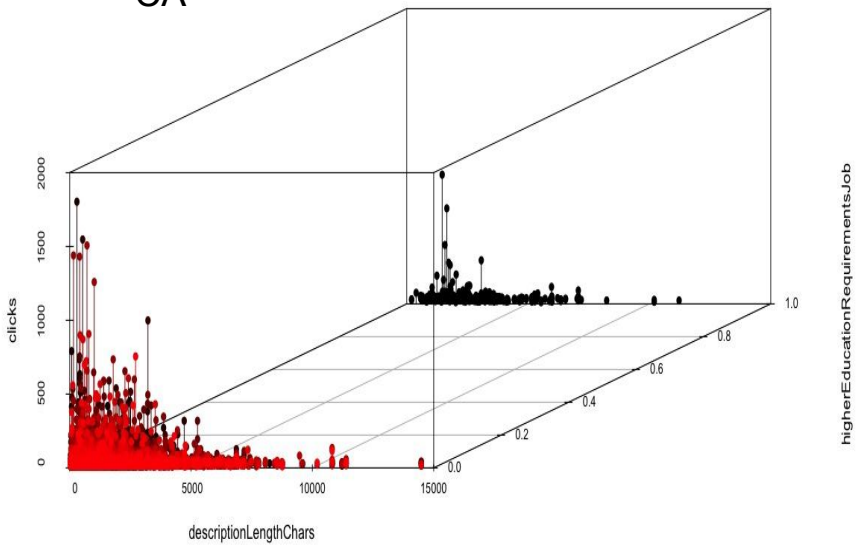


Log smalldata3 plots

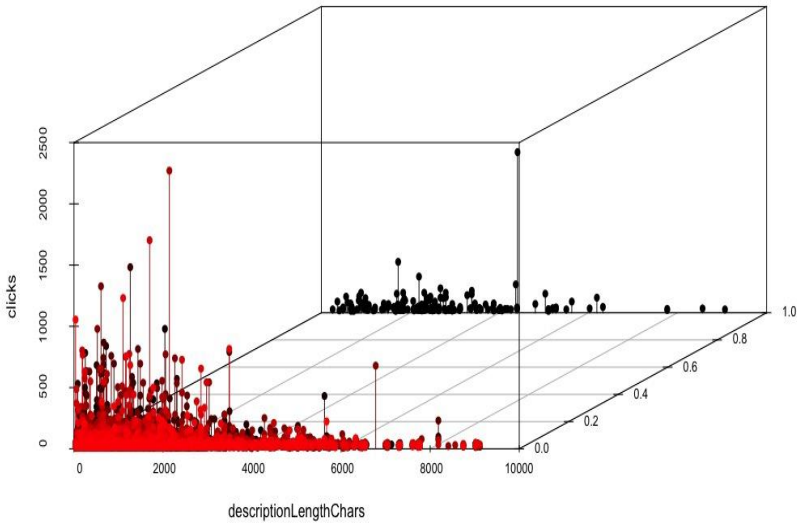
job clicks in the states



CA



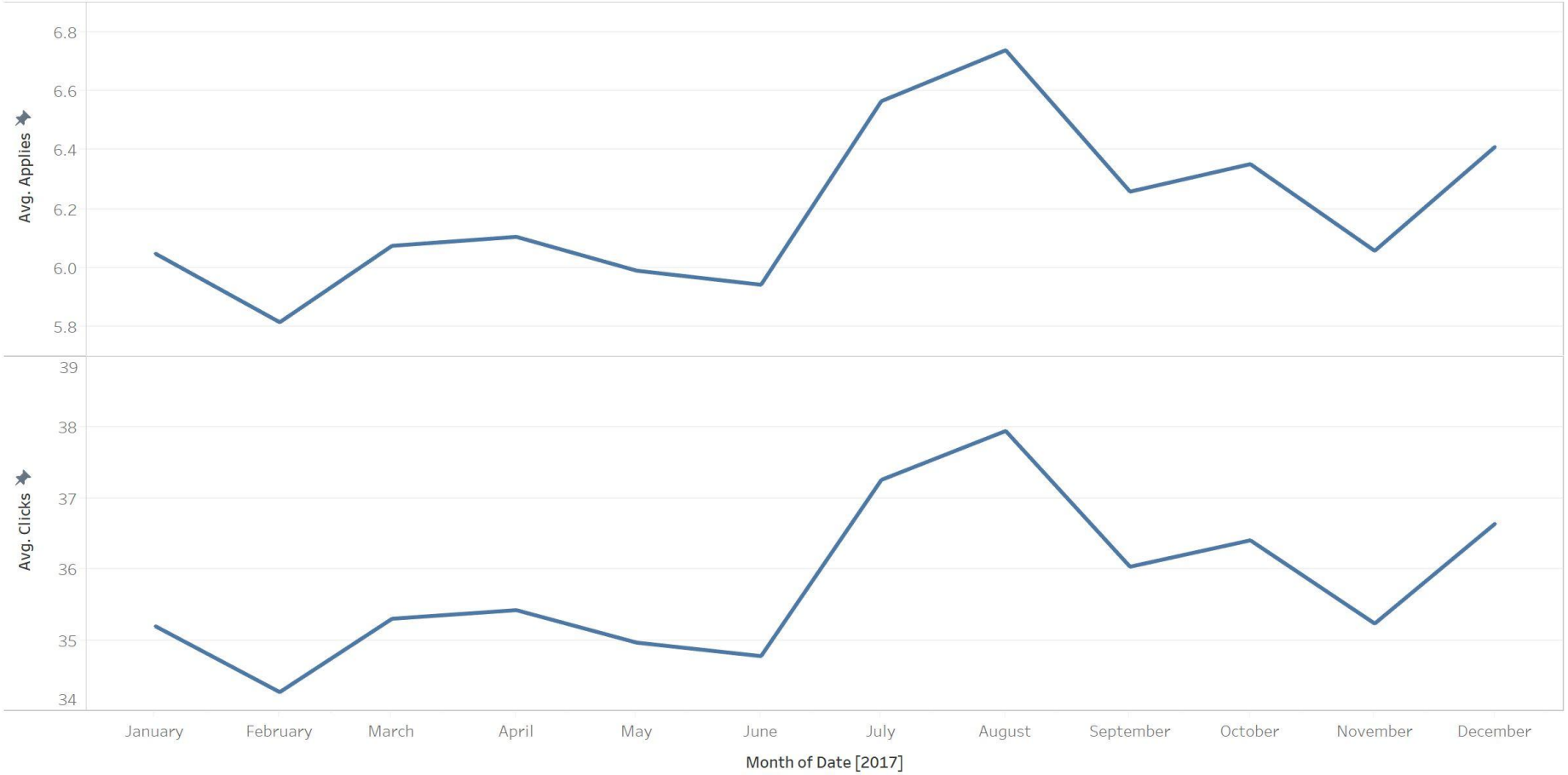
NY

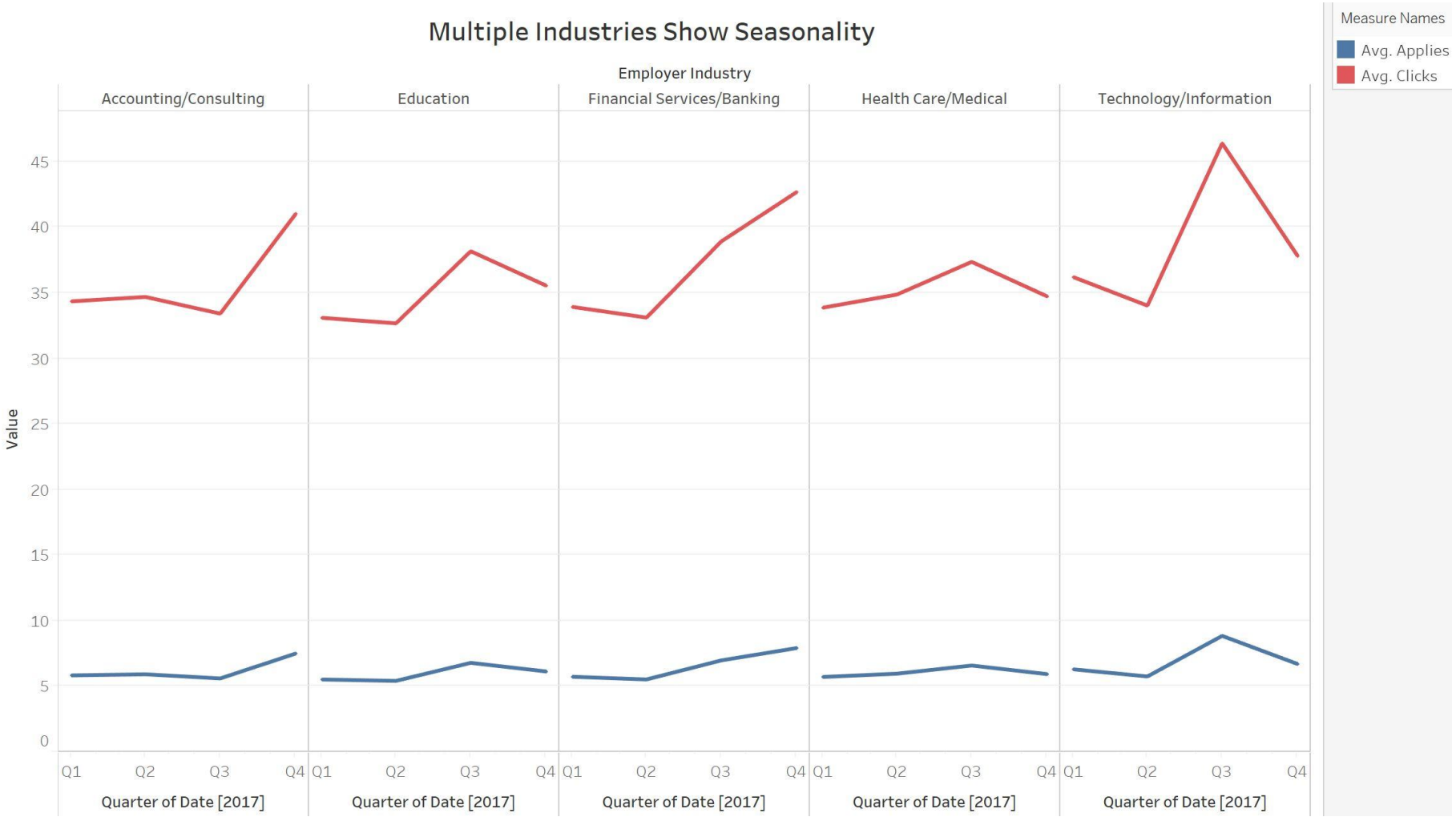


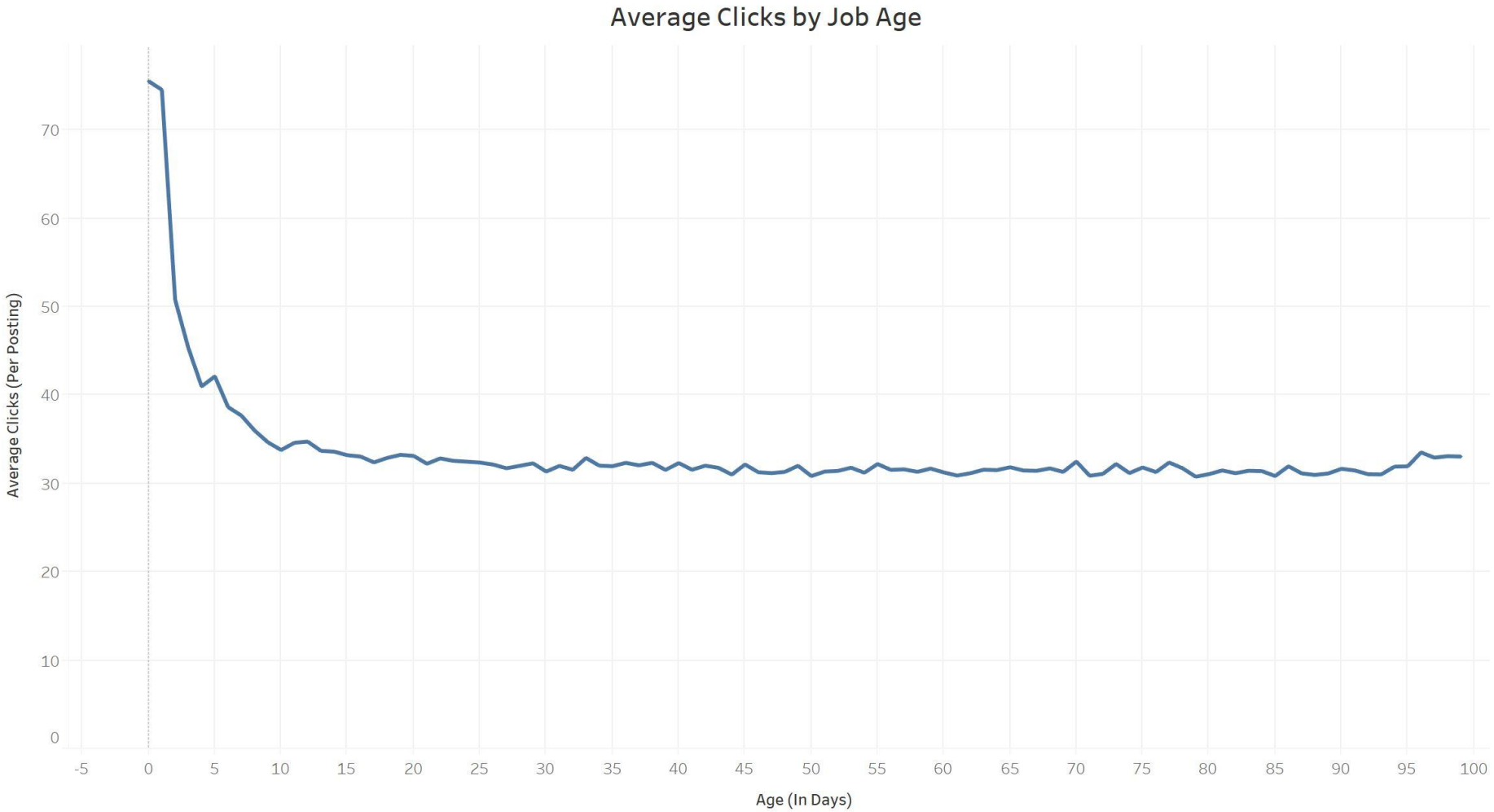
Statistically Significant: Indeed

Aidan Price | Henry Noke | Diana Hansen
Samuel Baltrus | Kristen Bonsall

Average Clicks and Applies Per Month




Multiple Industries Show Seasonality
Employer Industry
Accounting/Consulting
Education
Financial Services/Banking
Health Care/Medical
Technology/Information
Value
45
40
35
30
25
20
15
10
5
0
Q1
Q2
Q3
Q4
Quarter of Date [2017]
Measure Names
Avg. Applies
Avg. Clicks


Average Clicks by Job Age
Average Clicks (Per Posting)
70
60
50
40
30
20
10
0
-5
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
Age (In Days)

Trends in the NYC Health Industry

Presented by: MoData {MoMoney}
Mount Holyoke College

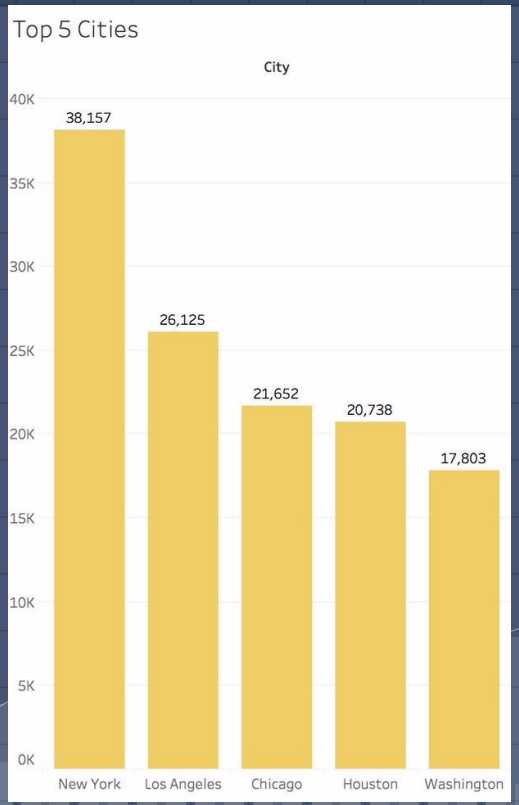
What are we looking for?

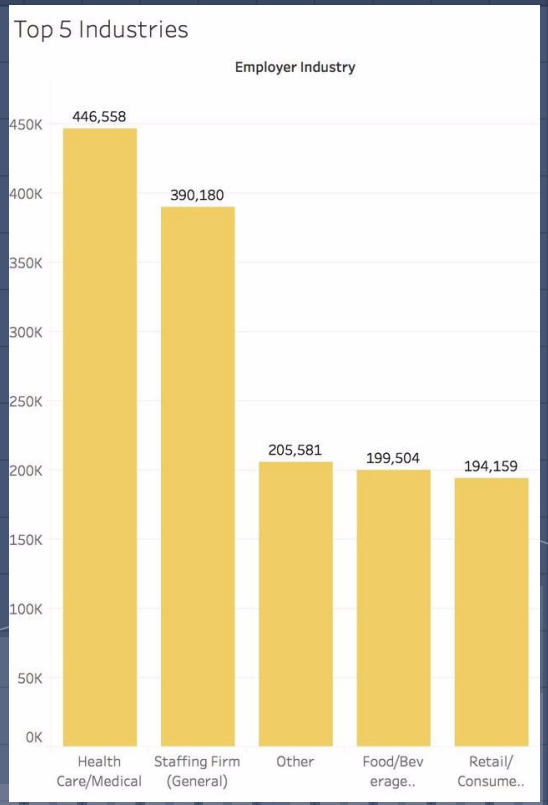
- Where should someone looking for jobs apply?
- When should someone apply to these jobs?

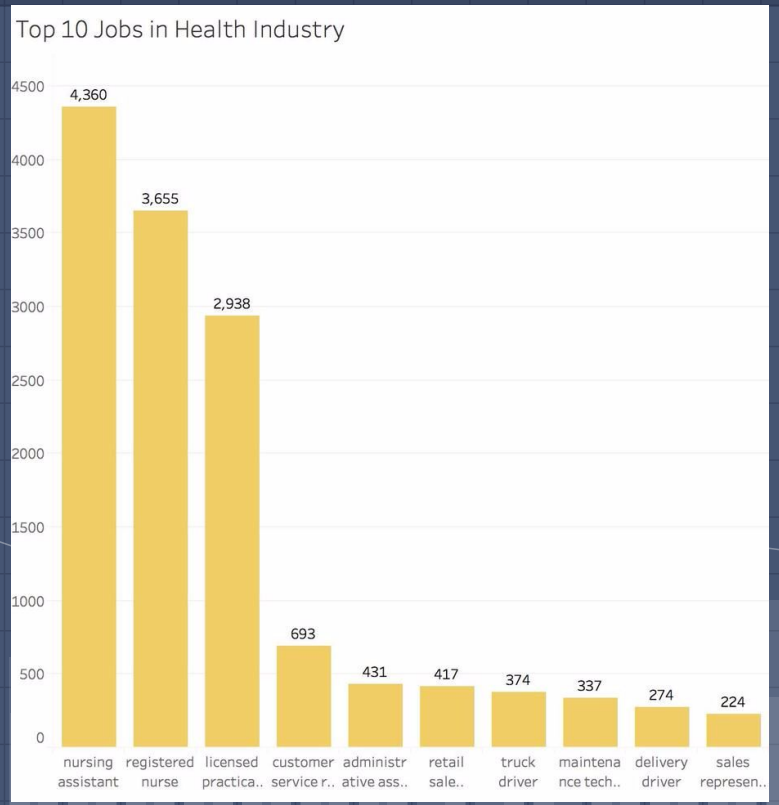
What data did we use?

- Indeed Dataset
- Bureau of Labor Statistics: NYC Jobs
- Google Trends

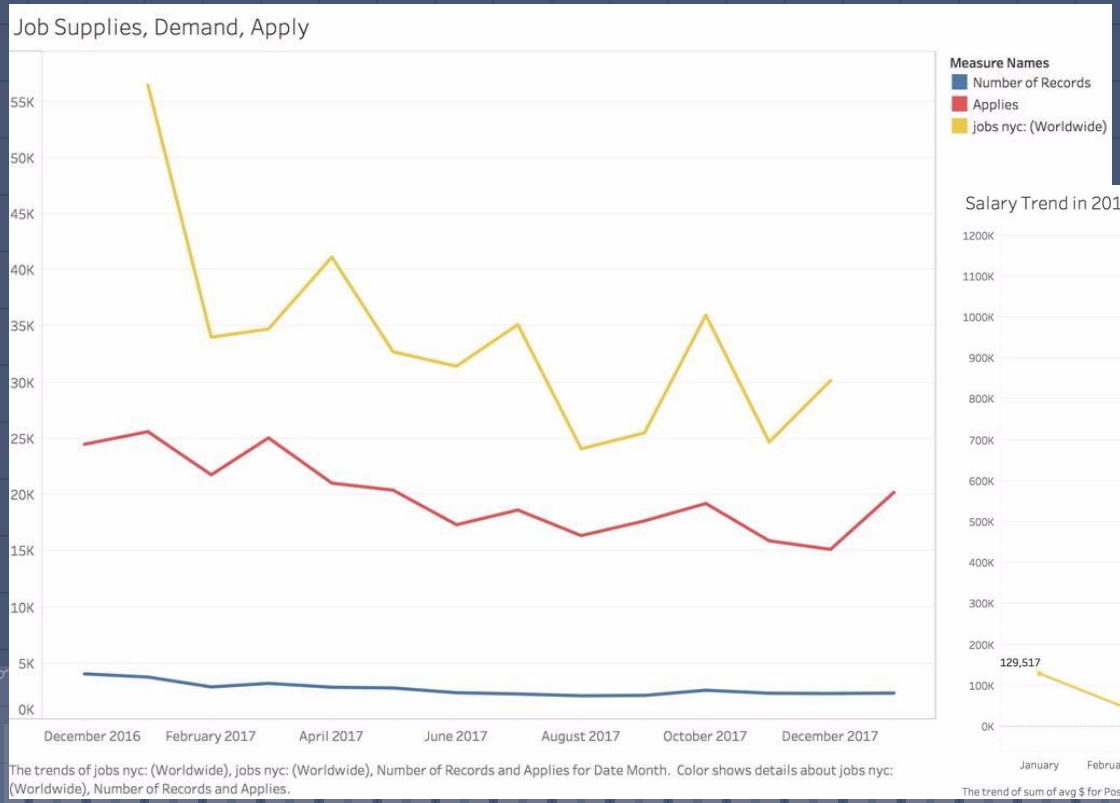
Why Health Industry in NYC?

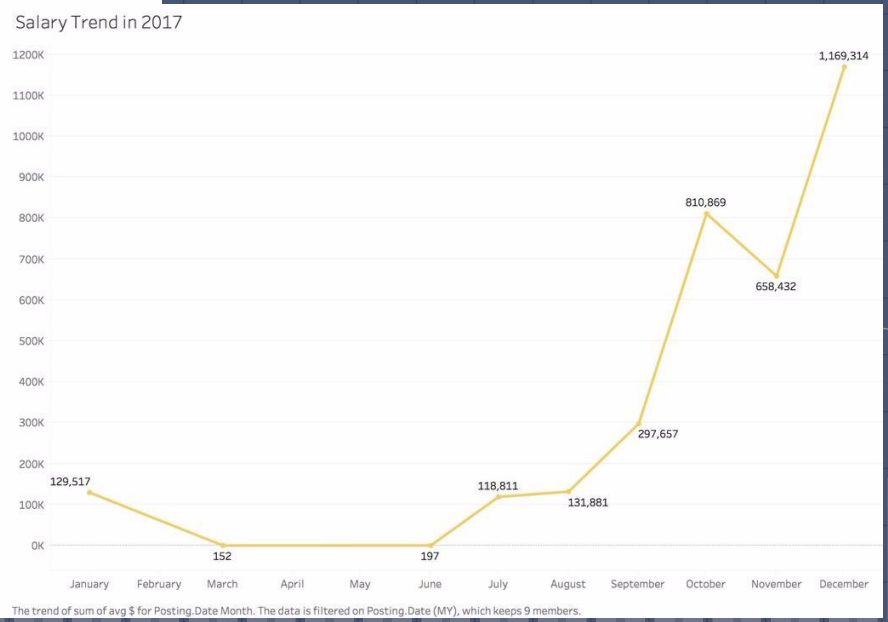






Supply & Demand for Jobs



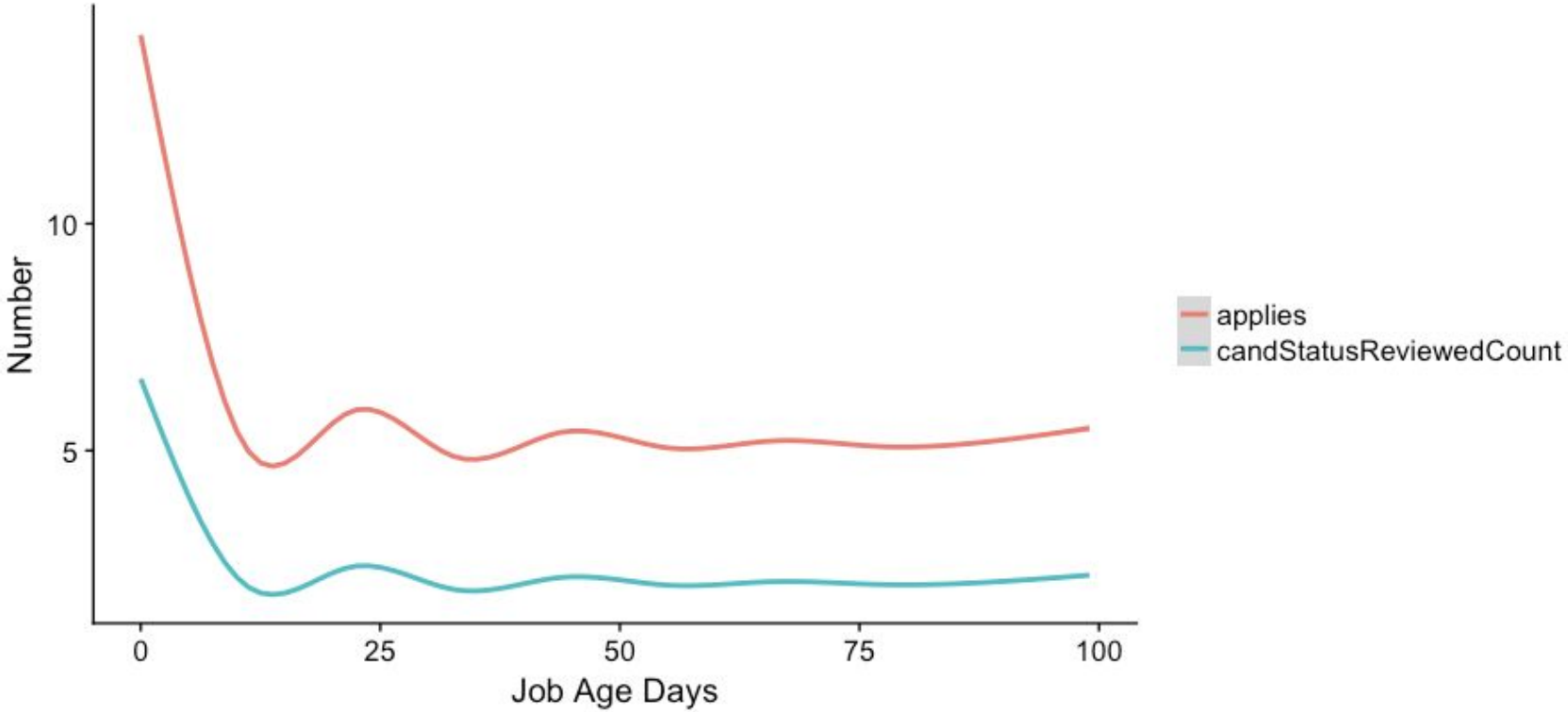


We Don’t Work in a Vacuum

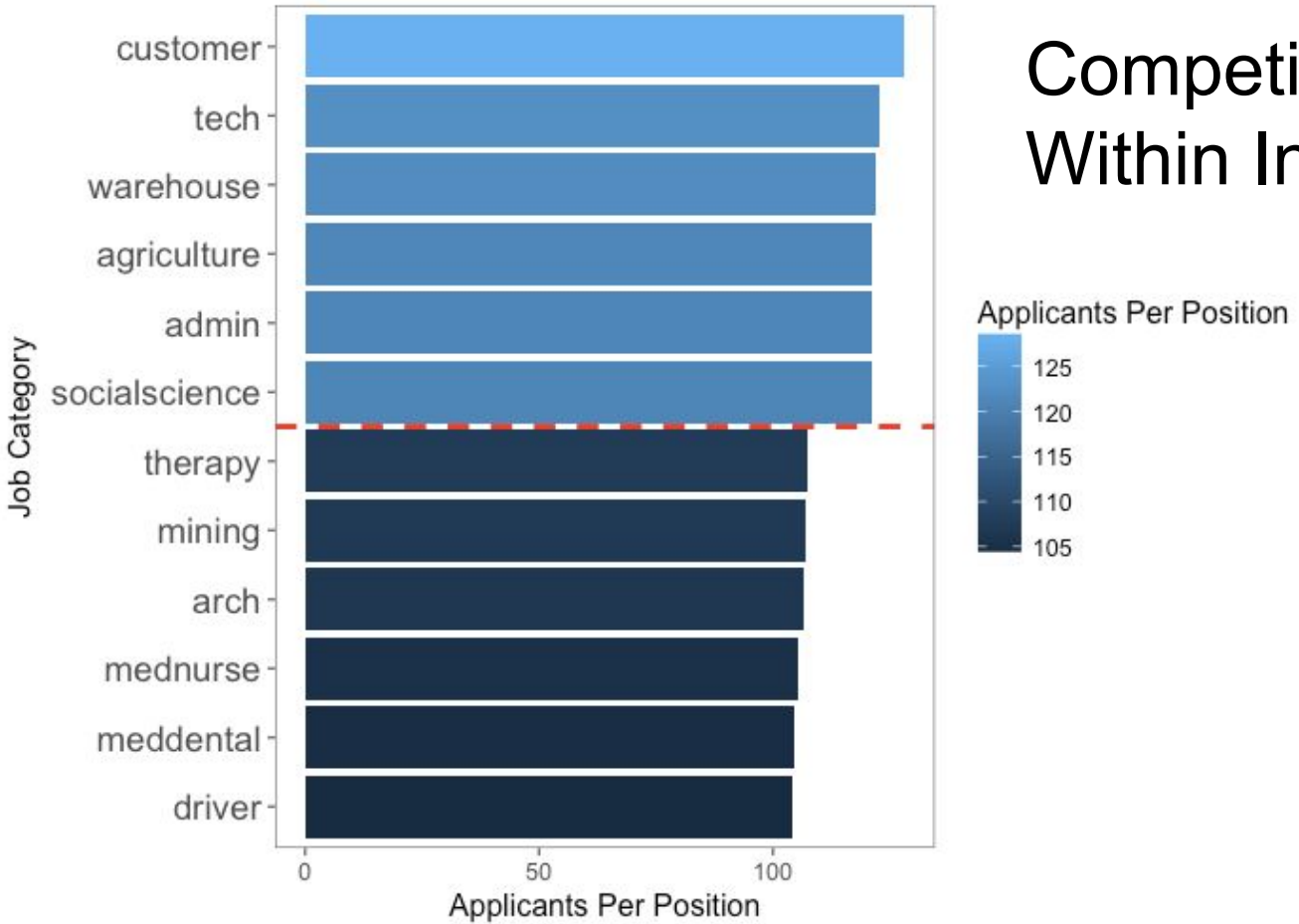
datacHAMPs 1

Kirsten Lydic, Brooke Fitzgerald, Hunter Johns, Kyoko Sano, Cindy Fang

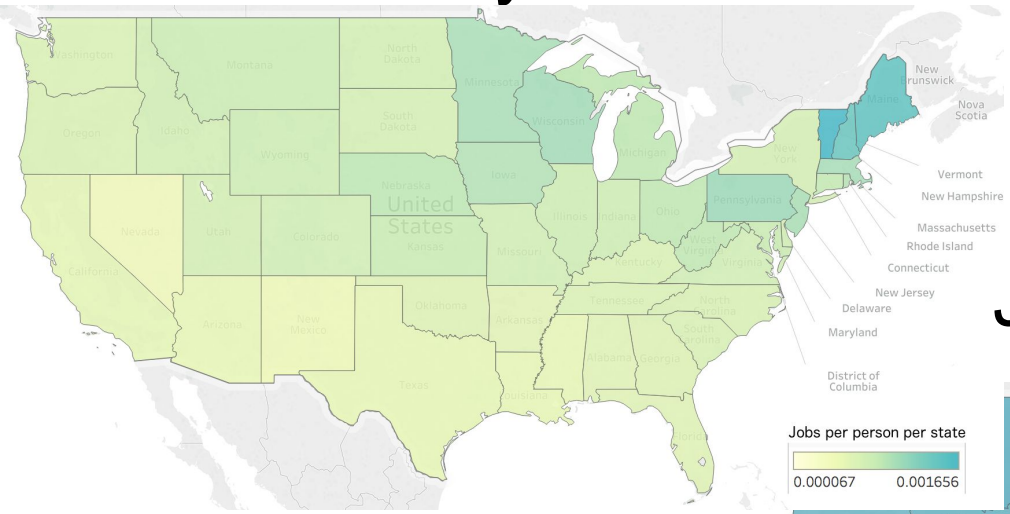
Lifetime of a Job



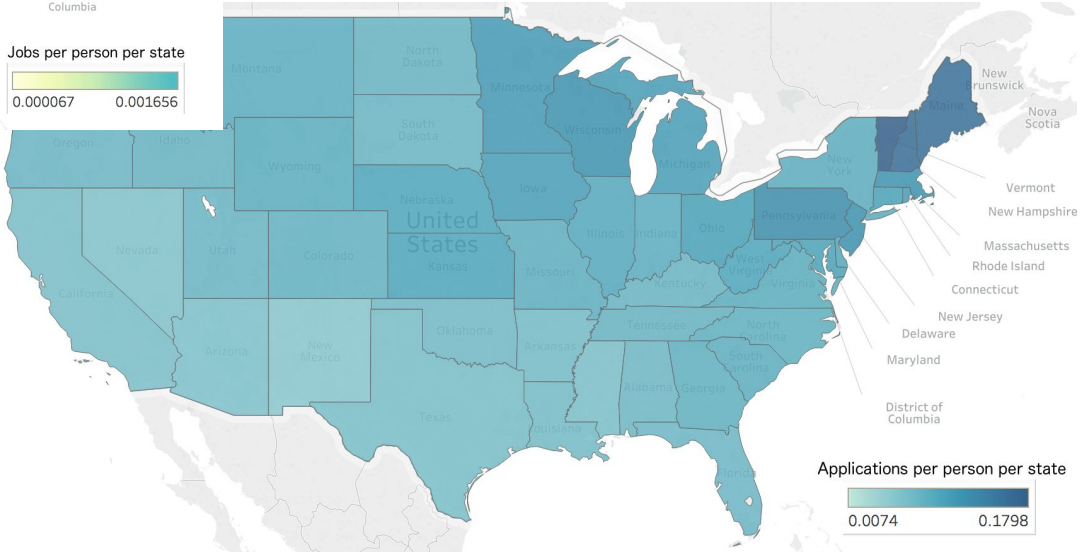
Competitiveness Within Industries



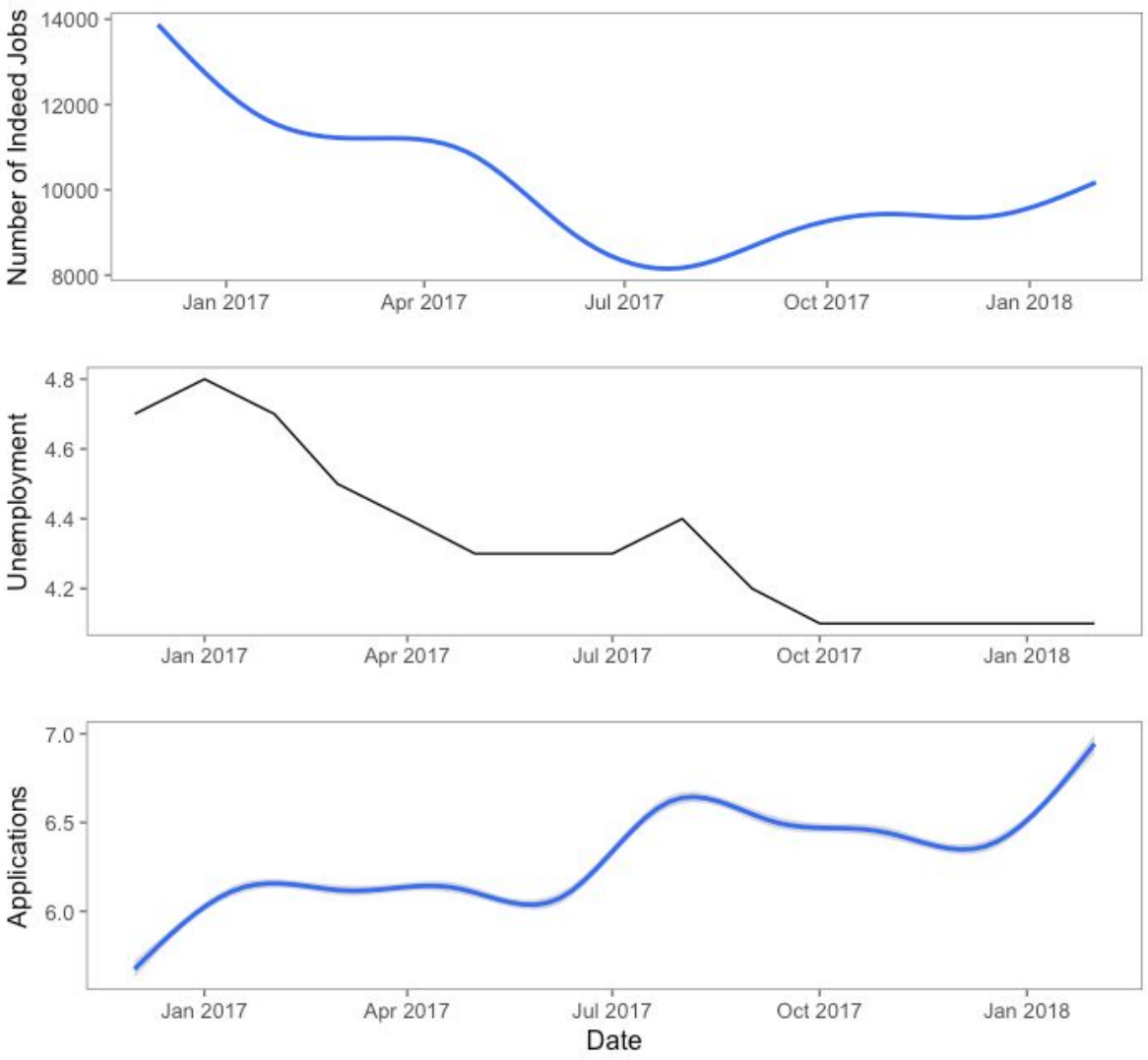
Job Availability Per State



Job Applications per State



Postings and Unemployment



Team: Three Musketeers
Amherst College

Affordable Care Act

Medicaid expansion

- Covers income below 138% of federal poverty line
- Covers chronic mental illness/ disabilities

- 32 states adopted (and D.C.)
- 18 states **did not** adopt

"Obamacare is in a death spiral. It's not going to get any better; it's getting worse."

-CEO of **AETNA**, February 2017

Do the states that expanded Medicaid demand more HC?

YES ($p < 0.05$). States that expanded demand more health care employees per capita

Is demand consistent with higher supply for healthcare jobs?

YES, supply-demand ratio consistent across all states, even with heightened demand

Is the growth in jobs actually due to Medicaid expansion?

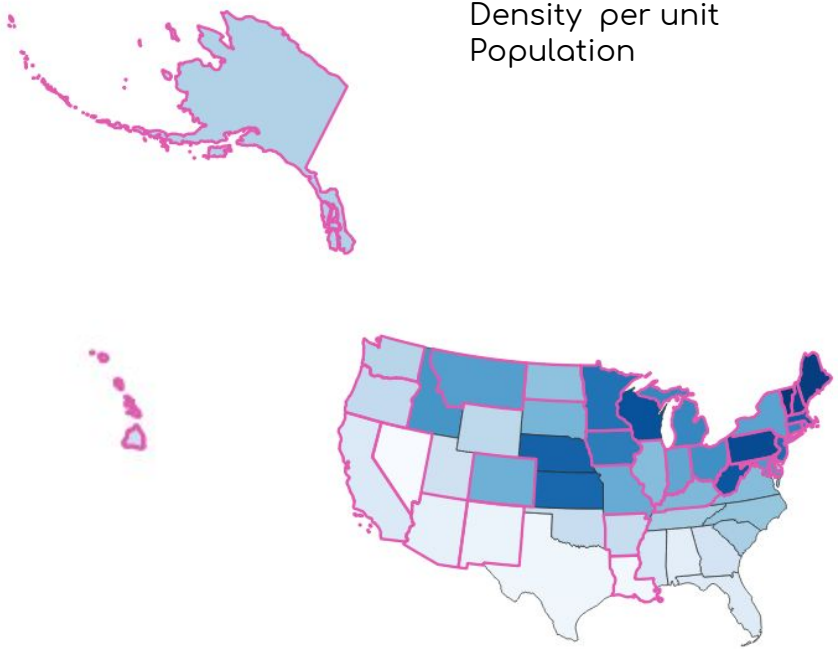
LIKELY. All states demanded similar employees per capita in sector distant from expansion

Are jobs in the HC industry accessible?

LESS THAN OTHERS, when compared to other industries, its postings most often require higher degrees

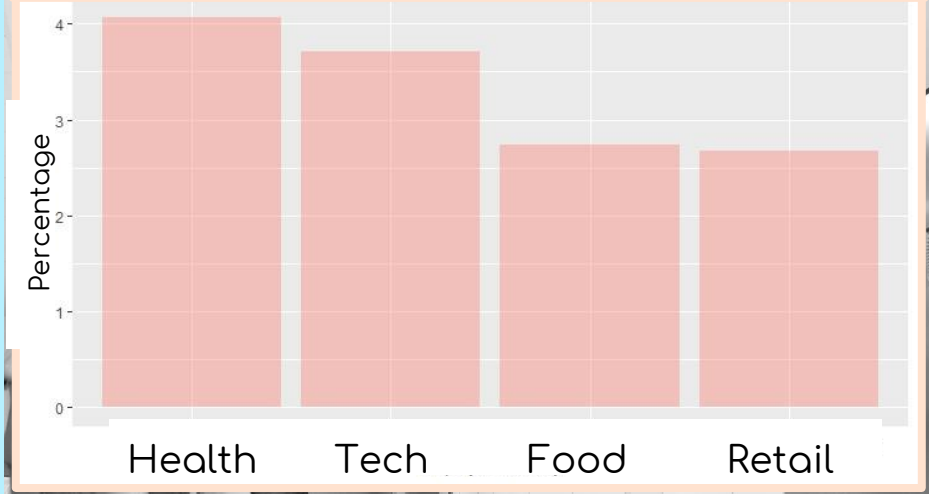
Job Density by State

*Dark color = higher Job Density per unit Population

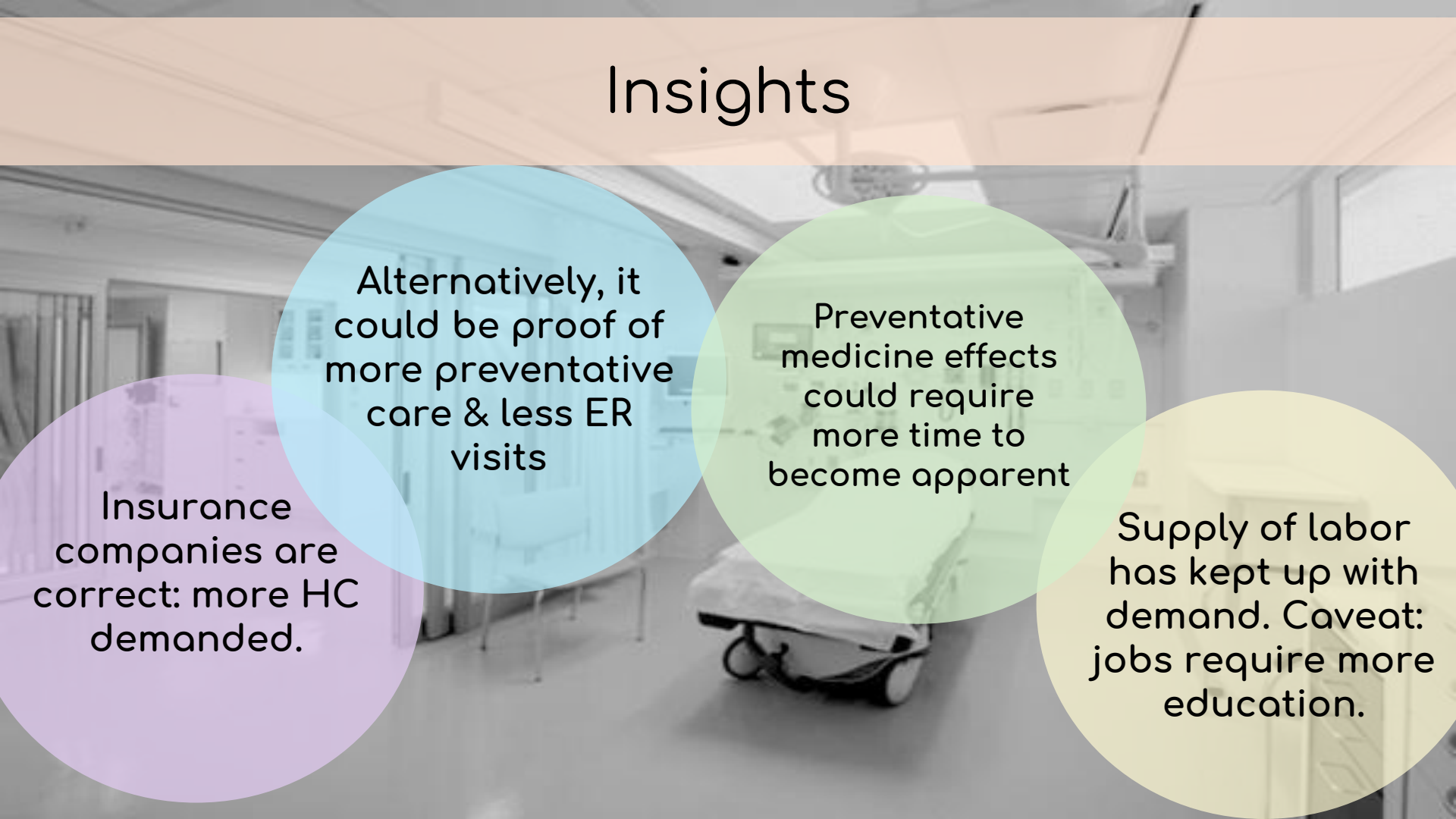


*Pink outlines are states that adopted Medicaid expansion

% of Non-General Ed Requirements by Industry



Insights



Insurance companies are correct: more HC demanded.

Alternatively, it could be proof of more preventative care & less ER visits

Preventative medicine effects could require more time to become apparent

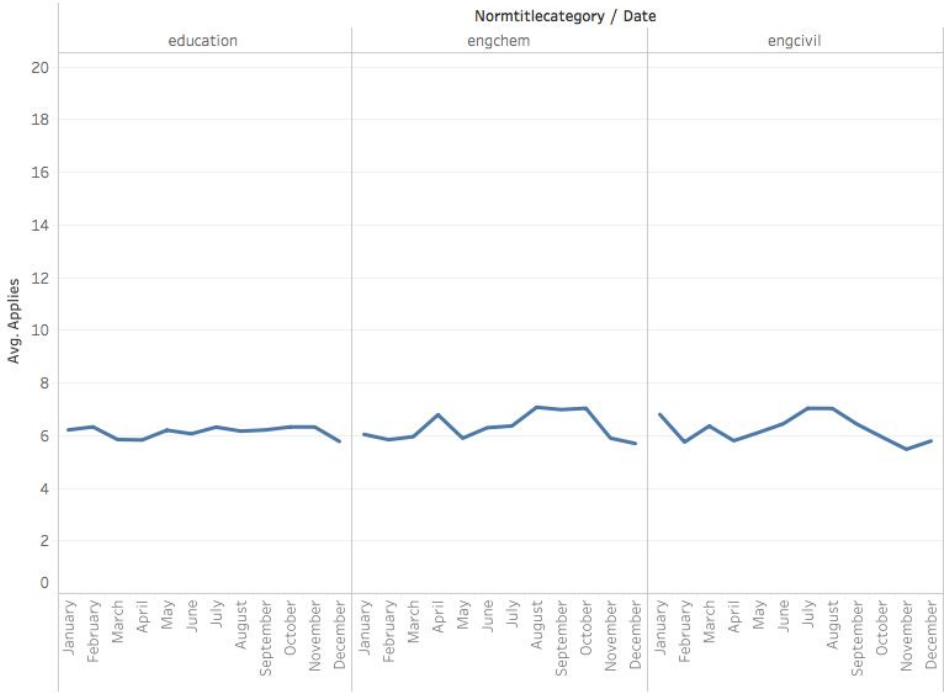
Supply of labor has kept up with demand. Caveat: jobs require more education.

Relationship between Industries, Traffic on Indeed, and Layoffs

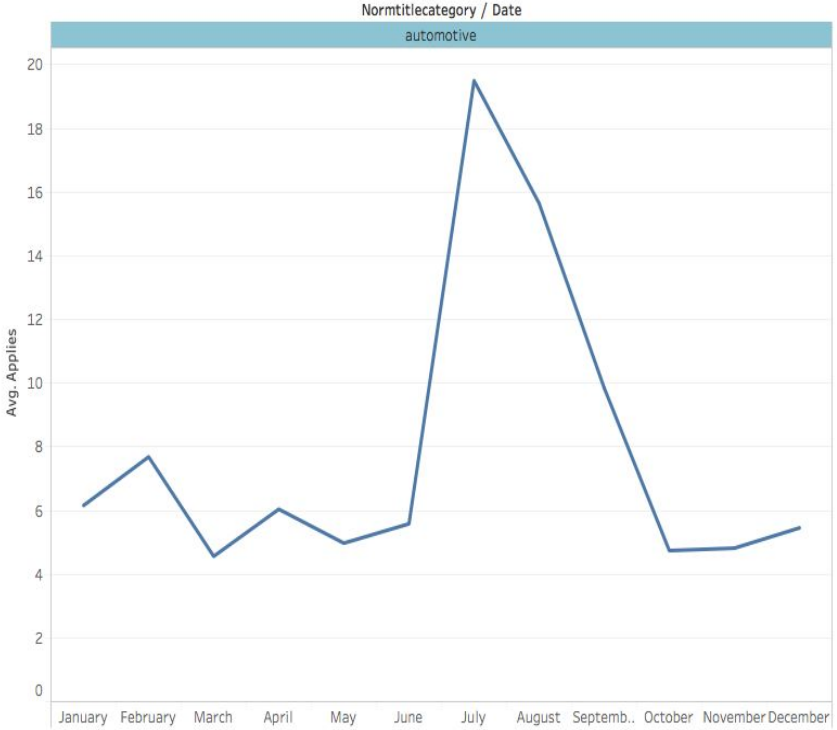
A presentation by
Sarah Manlove, Alicia Bochnak, Natalie Slabczynski,
Michaela Digan, & Chinh Do
(Team yEET)

Applications Across Industries

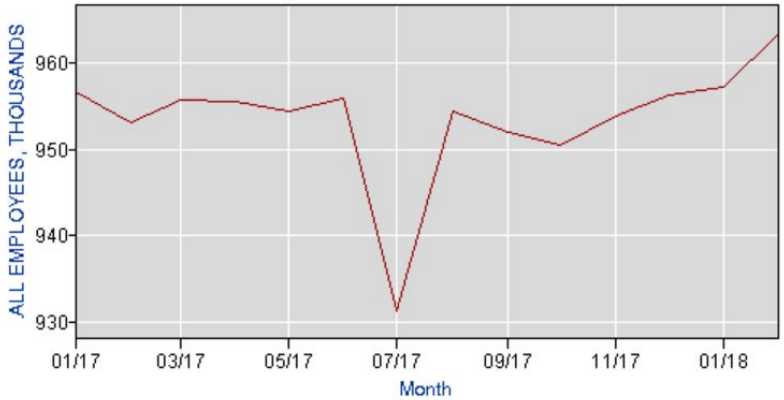
- Starting Ideas:
  - Brainstorm major events of 2017: Hurricane season, Russian Collusion, Charlottesville, #MeToo, potential trade wars
  - Do some industries receive more job applications at different times of the year?
  - I.E. landscaping in the spring and summer, plowing in the winter, ect
- Discovered an anomaly in the Automotive industry



Indeed Data vs Bureau of Labor Statistics Data



Seasonally Adjusted
Series Title: All employees, thousands, motor vehicles and parts, seasonally adjusted
Super Sector: Durable Goods
Industry: Motor vehicles and parts
NAICS Code: 3361,2,3
Data Type: ALL EMPLOYEES, THOUSANDS



https://data.bls.gov/timeseries/CES3133600101?data_tool=XGtable

According to this New York Times article, decreasing sales led automotive powerhouses to layoff a large number of employees in Summer 2017.

Meaning and Significance

- There seems to be a correlation between automotive layoffs and an increase in automotive job applications
  - People can shy away from changing fields especially later in life
  - They are going to look for jobs in their industry
- Pay-per-click model
  - Indeed profits from more clicks on job posting
- More clicks on job postings
  - Indeed can expect an increase in applications when an industry is in the red
  - When an industry has layoffs, Indeed can target users with experience in the relevant field
  - This all would lead to more profits for Indeed as well as providing more economic opportunities to those who fall victim to layoffs