EISHA PATEL

DATA VISUALIZATION OF GLASSDOOR REVIEWS

MOTIVATION

PERFORM AN EXPLORATORY ANALYSIS OF EMPLOYEE SENTIMENTS FROM GLASSDOOR REVIEWS USING ONLY VISUALS

OVERVIEW

Dataset

Tools

Data preprocessing

Visualizations

Conclusion

DATASET

Tools

Data preprocessing

Visualizations

Conclusion

DATASET

- 67k employee reviews for Google, Amazon, Facebook, Apple, and Microsoft
- Source: kaggle.com

DATASET

25 Feb, 2019

"Awesome company to work in."

Current Employee - Product Management in Mountain View, CA (US)

Recommends | Positive Outlook | Approves of CEO

I have been working at Google full-time (More than 8 years)

Pros

Do I really need to write this.

Cons

It's too big, the smaller employees are overlooked.

Advice to Management

Take care of the little guys

Helpful

Columns

#	index	
A	company	Company Name
A	location	Location of Company(May include country)
📅	dates	Date
A	job-title	Job Title
A	summary	Summary of Employee Review
A	pros	Employee Review (Pros)
A	cons	Employee Review (Cons)
A	advice-to-mgmt	Advice to Management
#	overall-ratings	Overall Rating (1-5)
A	work-balance-stars	Work/Life Balance Rating (1-5)
A	culture-values-stars	Culture and Values Rating (1-5)
A	carrer-opportunities-stars	Career Opportunities Rating (1-5)
A	comp-benefit-stars	Comp & Benefits Rating (1-5)
A	senior-mangemnet-stars	Senior Management Rating (1-5)
#	helpful-count	Helpful Review Count
🔗	link	Link to Review (might be outdated)

Dataset

TOOLS

Data preprocessing

Visualizations

Conclusion

TOOLS

python™

plotly

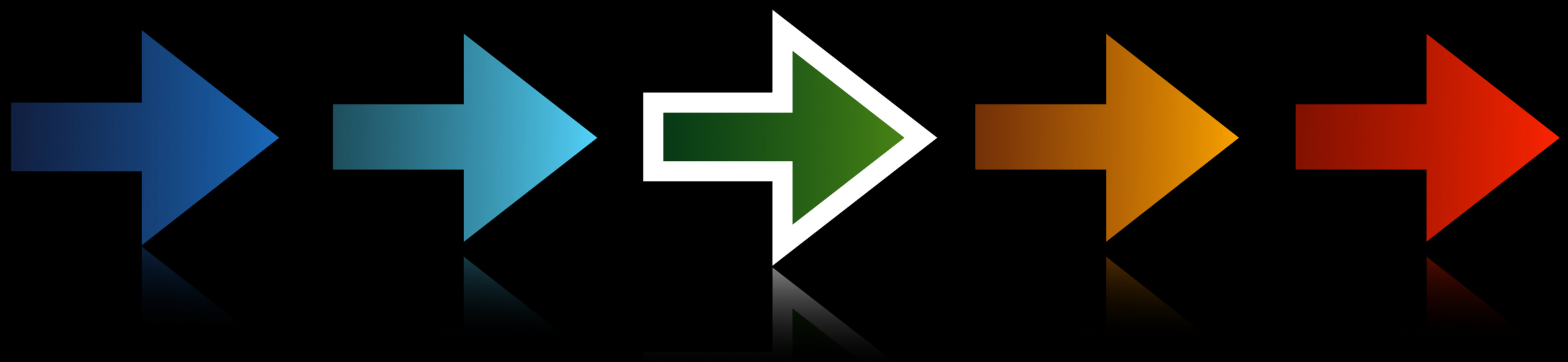
Dataset

Tools

DATA PREPROCESSING

Visualizations

Conclusion



DATA PRE-PROCESSING

- Load .csv file of dataset into Python
- Drop all unnecessary columns
- Filter dataset to keep only U.S/ Canadian locations
- Drop any rows with missing values
- 31,089 reviews remaining

Dataset

Tools

Data preprocessing

VISUALS

Conclusion

VISUALIZATION: *HISTOGRAMS*

Columns Used

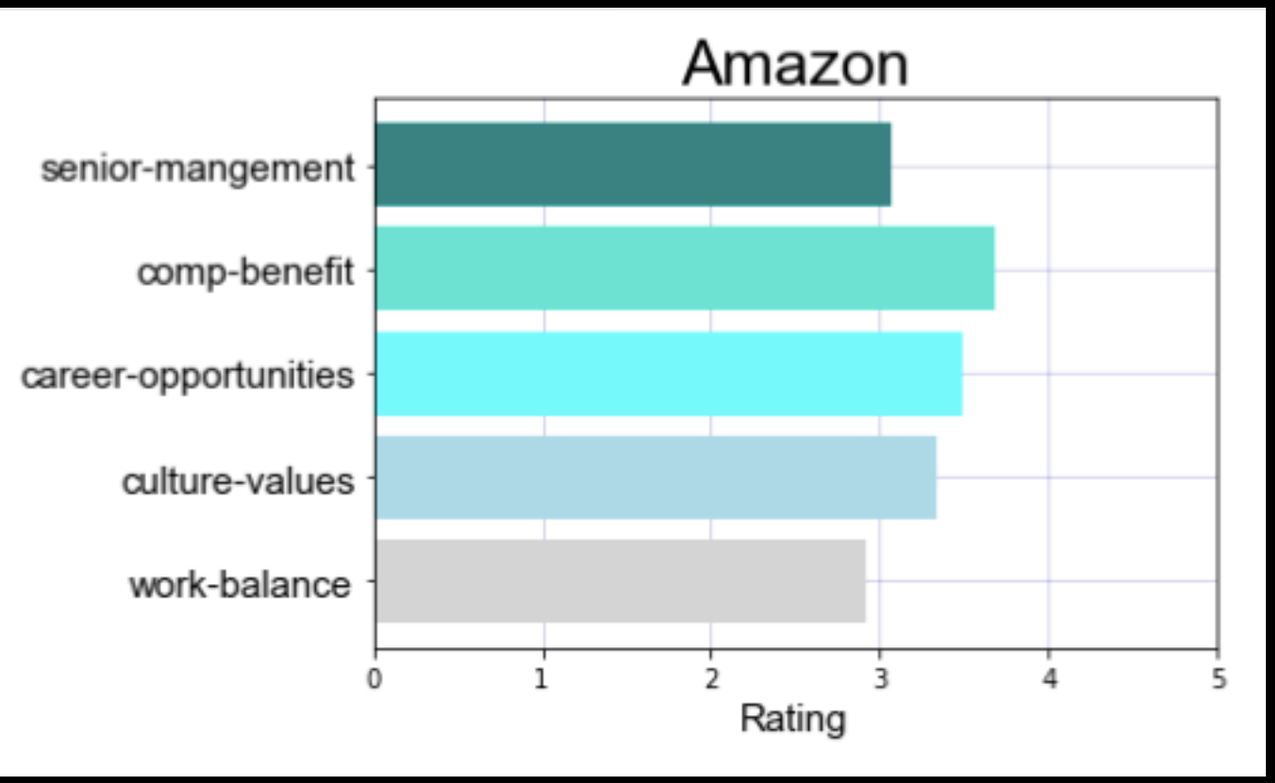
- Overall Rating (1-5)
- Work-Balance Rating (1-5)
- Culture Values Rating (1-5)
- Career Opportunities Rating (1-5)
- Benefits Rating (1-5)
- Senior Management Rating (1-5)

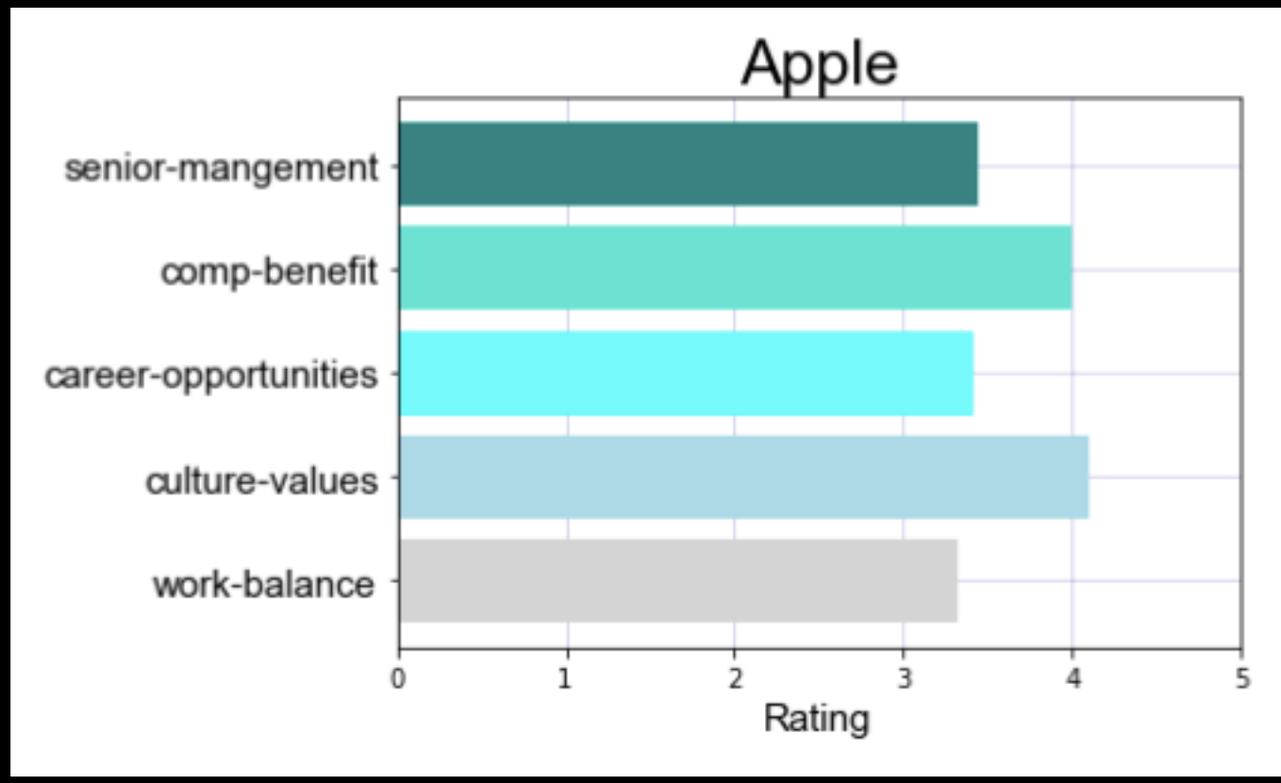
Data Prep

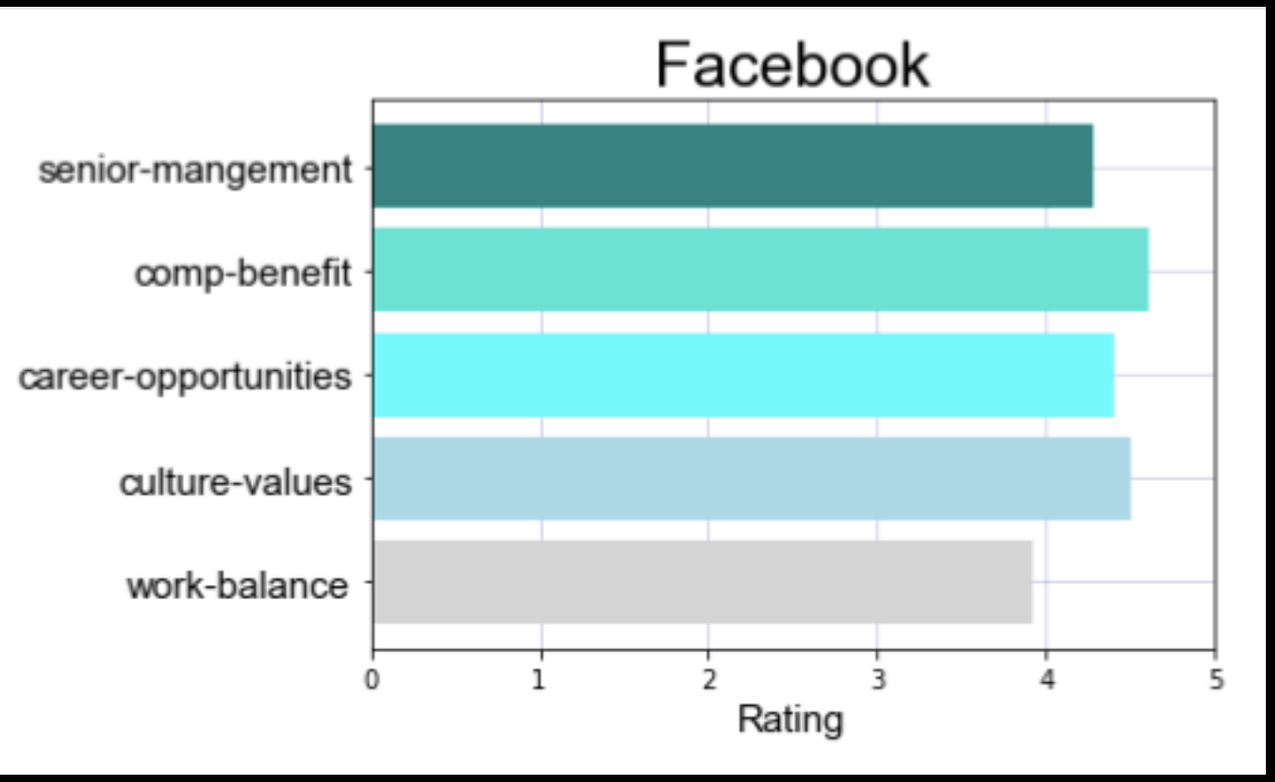
- Compute the mean of each rating category for each company

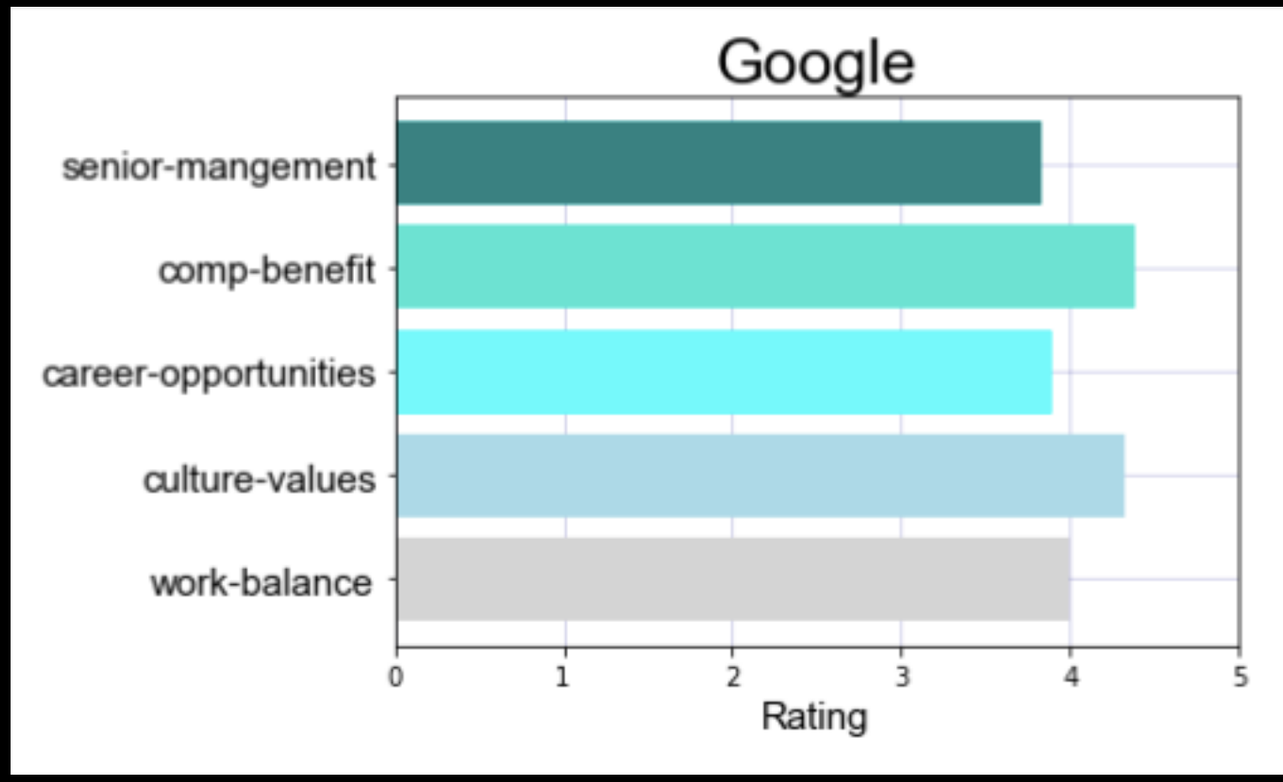
Packages

- matplotlib


Amazon
senior-mangement
comp-benefit
career-opportunities
culture-values
work-balance
0
1
2
3
4
5
Rating


Apple
senior-mangement
comp-benefit
career-opportunities
culture-values
work-balance
0
1
2
3
4
5
Rating


Facebook
senior-mangement
comp-benefit
career-opportunities
culture-values
work-balance
0
1
2
3
4
5
Rating


Google
senior-mangement
comp-benefit
career-opportunities
culture-values
work-balance
0
1
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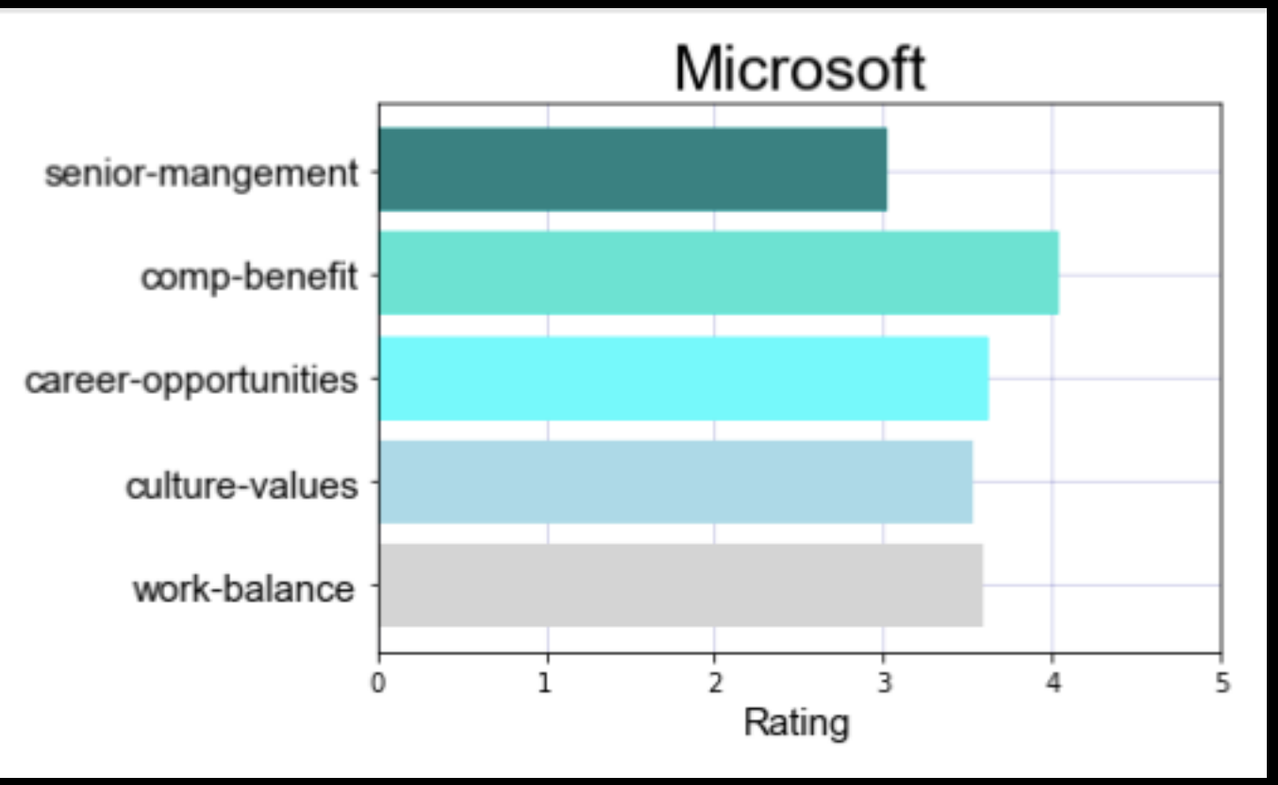
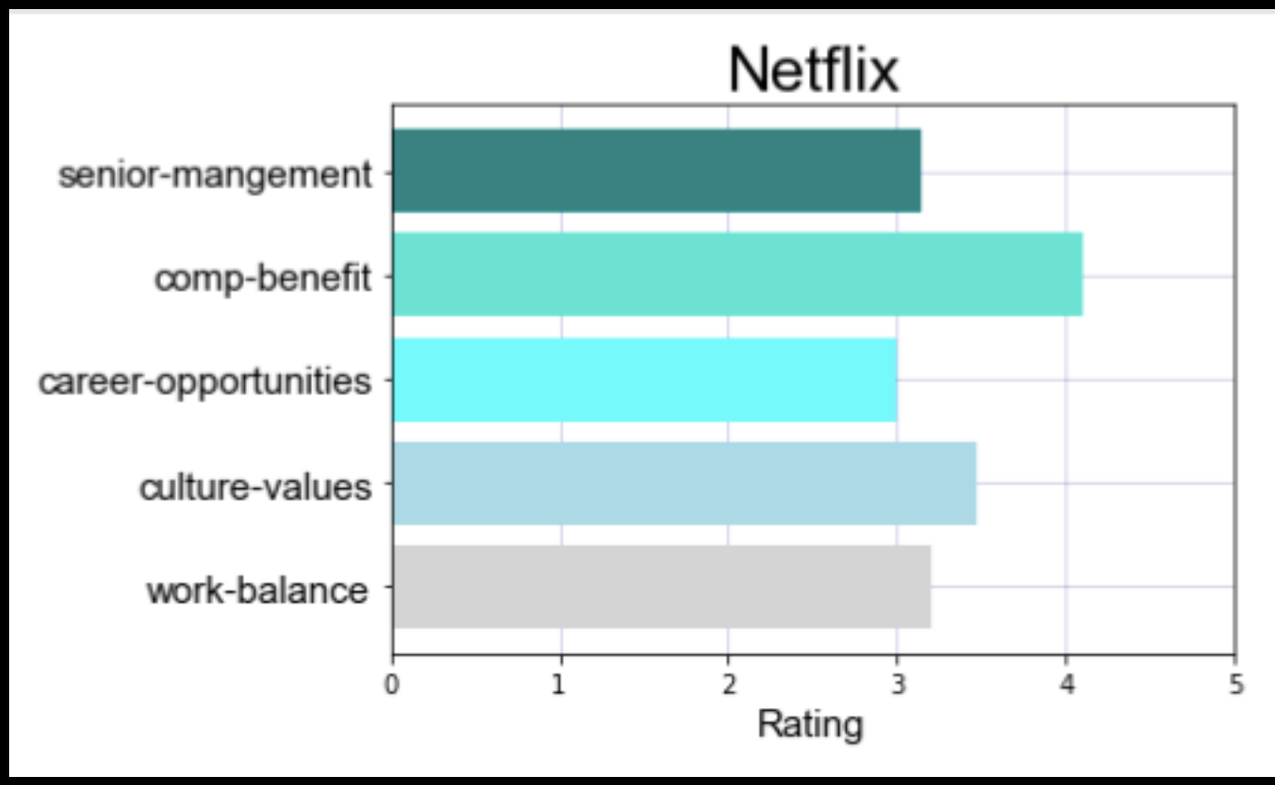
3
4
5
Rating


Microsoft
senior-mangement
comp-benefit
career-opportunities
culture-values
work-balance
0
1
2
3
4
5
Rating


Netflix
senior-mangement
comp-benefit
career-opportunities
culture-values
work-balance
0
1
2
3
4
5
Rating

SUMMARY OF FINDINGS

```
THE HALL OF SHAME!

The Worst Senior Management Rating is 3.02 at Microsoft.
The Worst Compensation and Benefits Rating is 3.68 at Amazon.
The Worst Career Opportunity Rating is 2.99 at Netflix.
The Worst Culture and values Rating is 3.34 at Amazon.
The Worst Work-Balance Rating is 2.91 at Amazon.
```

VISUALIZATION: *WORDCLOUDS*

Columns Used

- Pros (text)
- Cons (text)

Data Prep

- Tokenize Data
- Remove stop-words, punctuations, and characters
- Group bigrams/trigrams
- Create term-frequency matrices

Packages

- gensim
- matplotlib

AMAZON

APPLE

FACEBOOK

managers
time
things
commute
cons
move
high
employees
culture
lot
life
balance
hard
fast
long
team
product
companies
lots
times
find
process
place
difficult
growth
hours
impact
management
career
pressure
feel
pretty
teams
big
environment
better
manager
growing
engineers
projects
politics
internal
level
bad
easy
fb
performance
thing
engineering
leadership
change
personal
review
expectations
focus
challenge
code
pace
business
well
year
tough
start
offices
meeting
expert
senior
stay
challenging
work_place
work_life
quality
perks
fing
fast
start
stuck
stuck_in
stuck_in_a
stuck_in_a_rut
stuck_in_a_rut_with
stuck_in_a_rut_with_the
stuck_in_a_rut_with_the_management
stuck_in_a_rut_with_the_management_team
stuck_in_a_rut_with_the_management_team_and
stuck_in_a_rut_with_the_management_team_and_the
stuck_in_a_rut_with_the_management_team_and_the_company
stuck_in_a_rut_with_the_management_team_and_the_company_is
stuck_in_a_rut_with_the_management_team_and_the_company_is_not
stuck_in_a_rut_with_the_management_team_and_the_company_is_not_willing
stuck_in_a_rut_with_the_management_team_and_the_company_is_not_willing_to
stuck_in_a_rut_with_the_management_team_and_the_company_is_not_willing_to_change
stuck_in_a_rut_with_the_management_team_and_the_company_is_not_willing_to_change_anything
stuck_in_a_rut_with_the_management_team_and_the_company_is_not_willing_to_change_anything_or
stuck_in_a_rut_with_the_management_team_and_the_company_is_not_willing_to_change_anything_or_even
stuck_in_a_rut_with_the_management_team_and_the_company_is_not_willing_to_change_anything_or_even_to
stuck_in_a_rut_with_the_management_team_and_the_company_is_not_willing_to_change_anything_or_even_to_try
stuck_in_a_rut_with_the_management_team_and_the_company_is_not_willing_to_change_anything_or_even_to_try_to
stuck_in_a_rut_with_the_management_team_and_the_company_is_not_willing_to_change_anything_or_even_to_try_to_do
stuck_in_a_rut_with_the_management_team_and_the_company_is_not_willing_to_change_anything_or_even_to_try_to_do_anything
stuck_in_a_rut_with_the_management_team_and_the_company_is_not_willing_to_change_anything_or_even_to_try_to_do_anything_new
stuck_in_a_rut_with_the_management_team_and_the_company_is_not_willing_to_change_anything_or_even_to_try_to_do_anything_new_or
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stuck_in_a_rut_with_the_management_team_and_the_company_is_not_willing_to_change_anything_or_even_to_try_to_do_anything_new_or_different_the_company_is_not_willing_to_change_anything_or_even_to_try_to_do_anything_new_or_different_the_company_is_not_willing
stuck_in_a_rut_with_the_management_team_and_the_company_is_not_willing_to_change_anything_or_even_to_try_to_do_anything_new_or_different_the_company_is_not_willing_to_change_anything_or_even_to_try_to_do_anything_new_or_different_the_company_is_not_willing_to
stuck_in_a_rut_with_the_management_team_and_the_company_is_not_willing_to_change_anything_or_even_to_try_to_do_anything_new_or_different_the_company_is_not_willing_to_change_anything_or_even_to_try_to_do_anything_new_or_different_the_company_is_not_willing_to_change
stuck_in_a_rut_with_the_management_team_and_the_company_is_not_willing_to_change_anything_or_even_to_try_to_do_anything_new_or_different_the_company_is_not_willing_to_change_anything_or_even_to_try_to_do_anything_new_or_different_the_company_is_not_willing_to_change_anything
stuck_in_a_rut_with_the_management_team_and_the_company_is_not_willing_to_change_anything_or_even_to_try_to_do_anything_new_or_different

GOOGLE

NETFLIX

MICROSOFT

- Word clouds were generated using term-frequencies
- Words occurring with higher frequencies are in larger font
- We can use the word clouds to identify common satisfactions/dissatisfactions of employees
- The word clouds give insight on the Work-Balance, Culture Values, Career Opportunities, Benefits, and Management offered at each company

VISUALIZATION: *GEOSPATIAL*

Columns Used

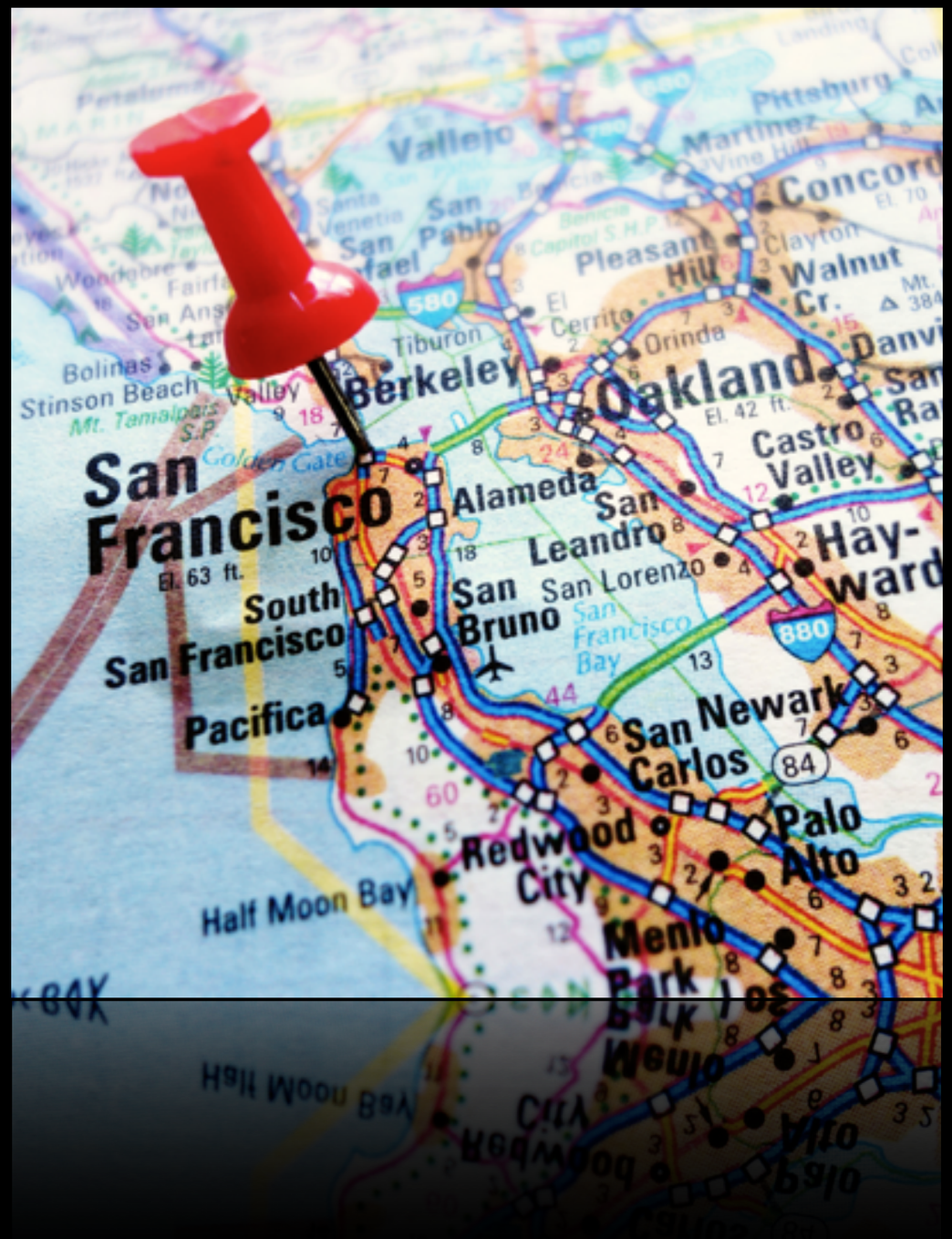
- Location (text)
- Overall-ratings (1-5)

Data Prep

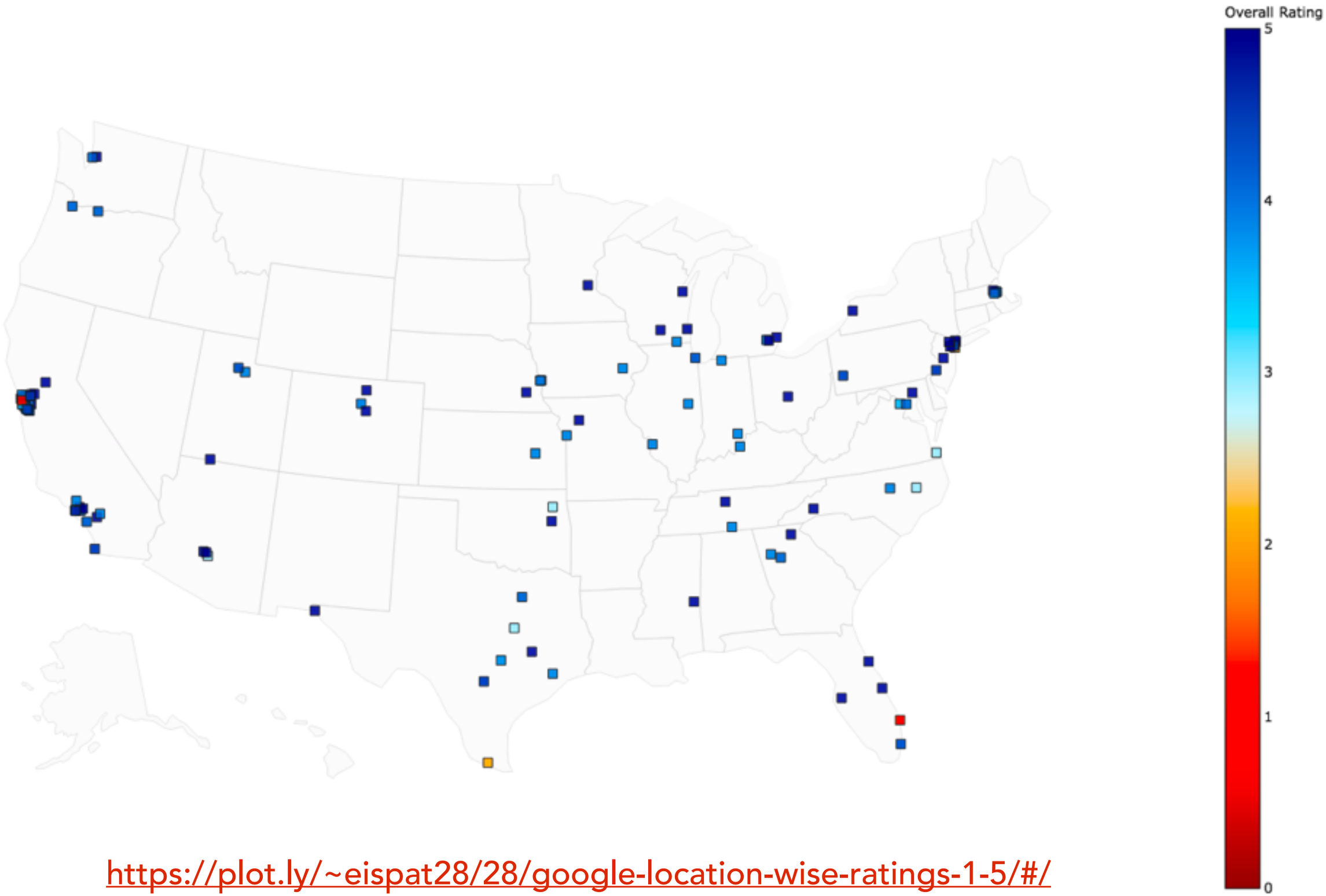
- Reduce dataset down to only US locations
- Drop 'fake' US cities - any mislabeled data
- Find the mean overall-rating for each company location-wise
- Given city and state, find latitude and longitude

Packages

- geopy.geocoders
- plotly



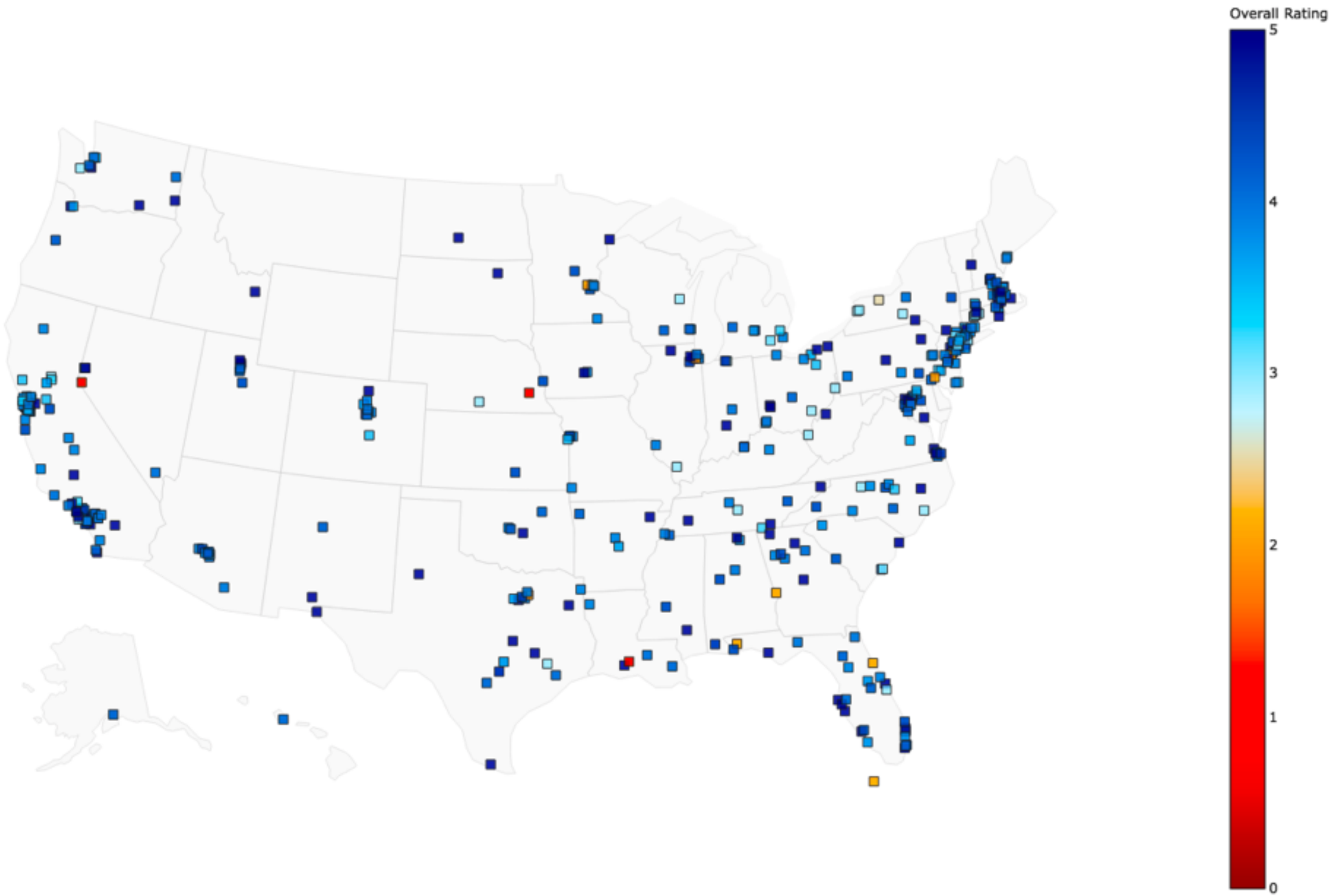
Google - Location-wise ratings (1-5)

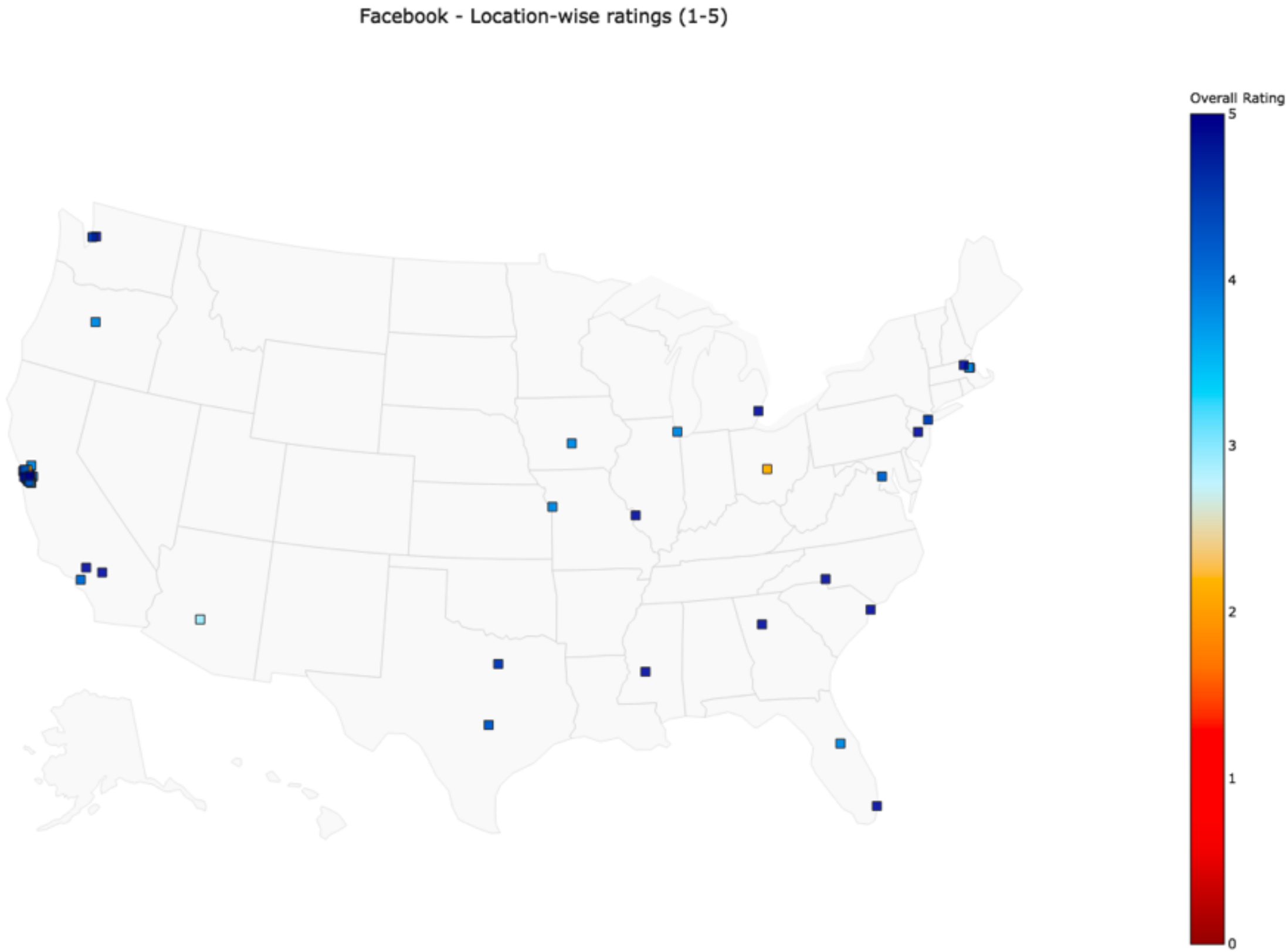


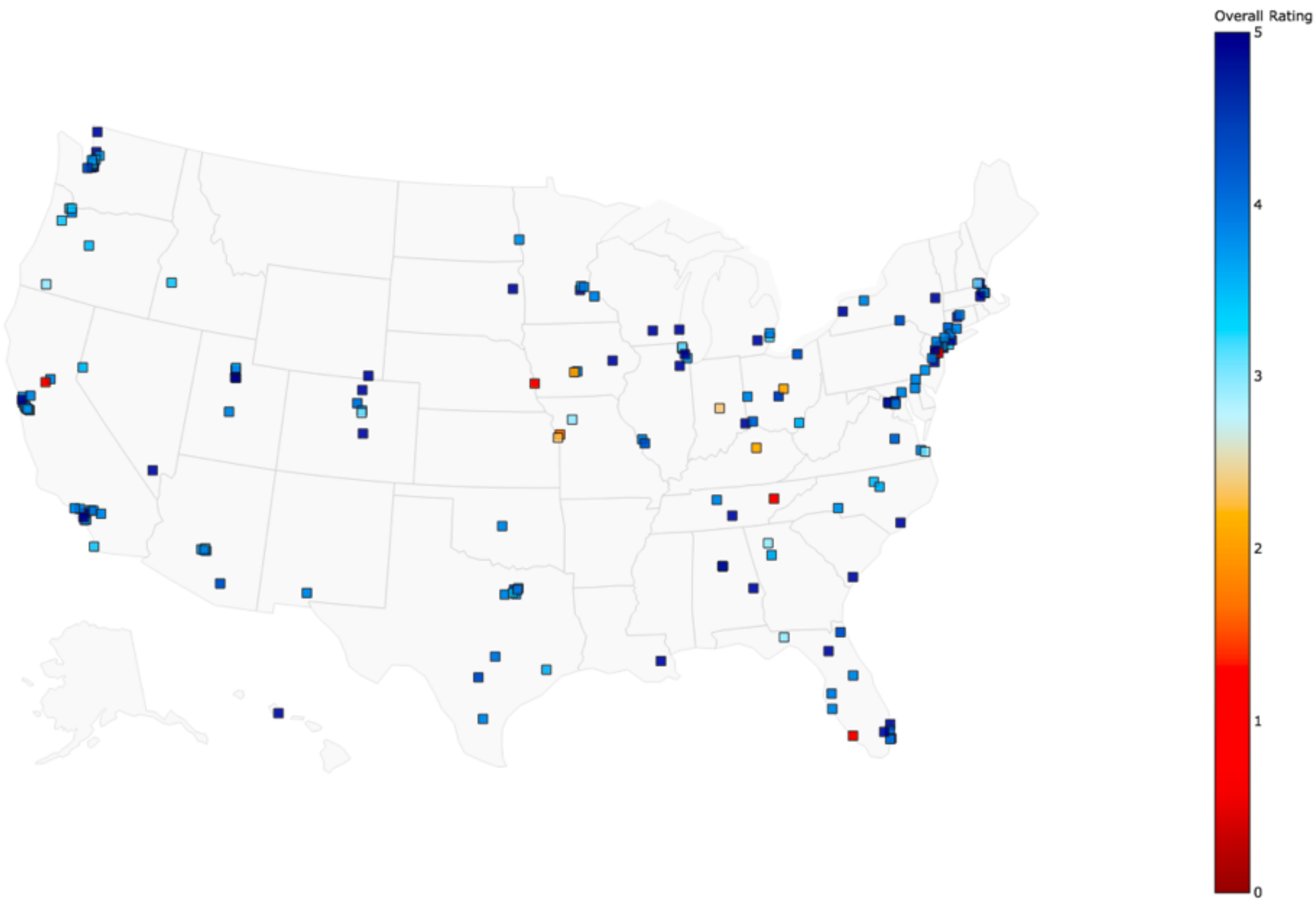
https://plot.ly/~eispat28/28/google-location-wise-ratings-1-5/#/

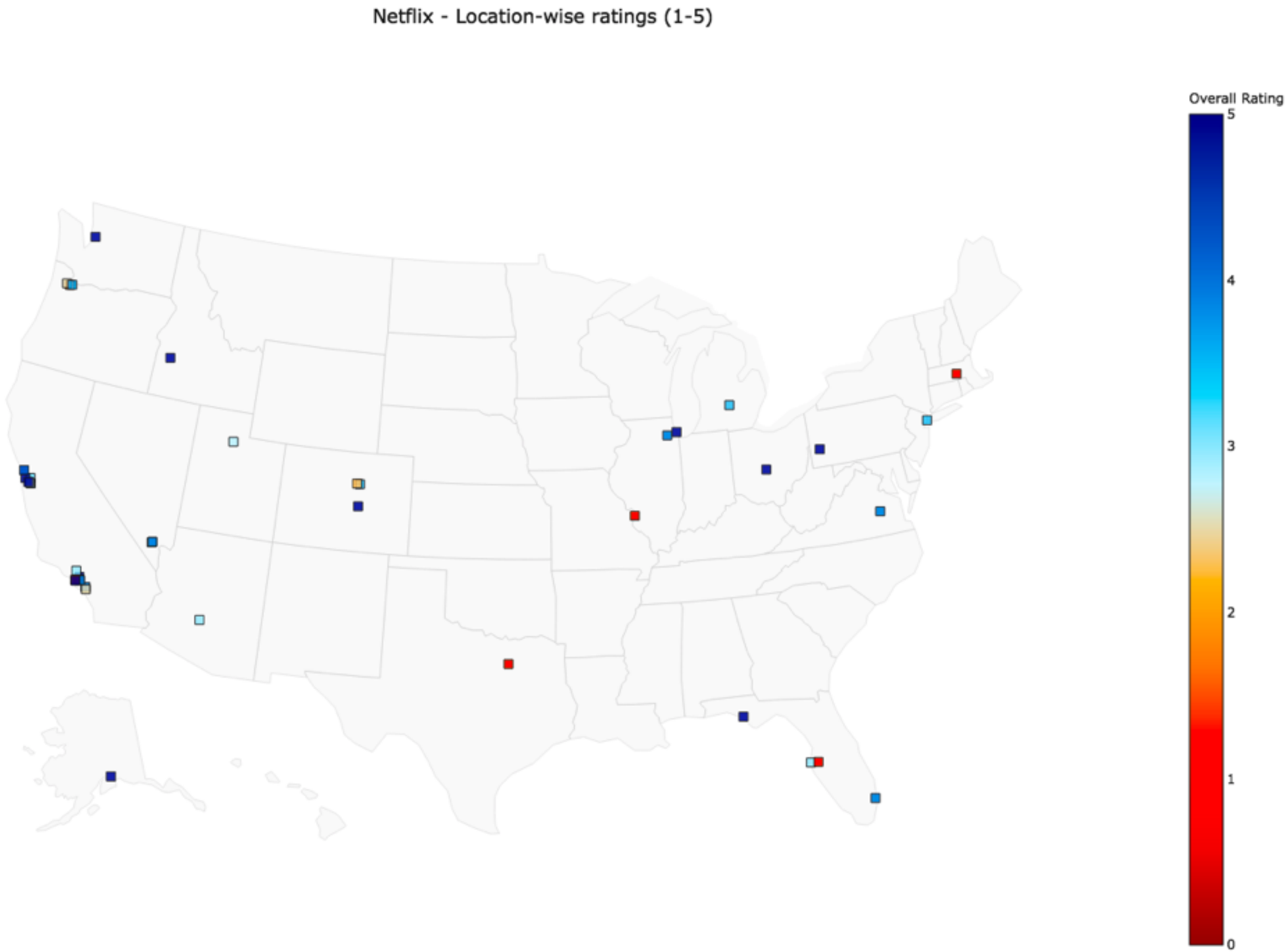
Amazon - Location-wise ratings (1-5)
Overall Rating
5
4
3
2
1
0

Apple - Location-wise ratings (1-5)




Facebook - Location-wise ratings (1-5)
Overall Rating
5
4
3
2
1
0


Microsoft - Location-wise ratings (1-5)
Overall Rating
5
4
3
2
1
0


Netflix - Location-wise ratings (1-5)
Overall Rating
5
4
3
2
1
0

- These maps show the average rating of each company location across the United States
- They also show the count and spread of company locations across the country
- Summary:
  - Google: many locations available and only 3 locations with rating below 2
  - Amazon: many locations with rating below 2 and majority rated around 3
  - Apple: handful of locations with rating below 2 but majority rated 4 or more
  - Facebook: only 2 locations with rating below 2 and overall very few locations across the country
  - Microsoft: handful of locations with rating below 2 most of which are located in the Eastern side of the country
  - Netflix: handful of locations with rating below 2 and overall very few locations across the country

VISUALIZATION: *TIME SERIES*

Columns Used

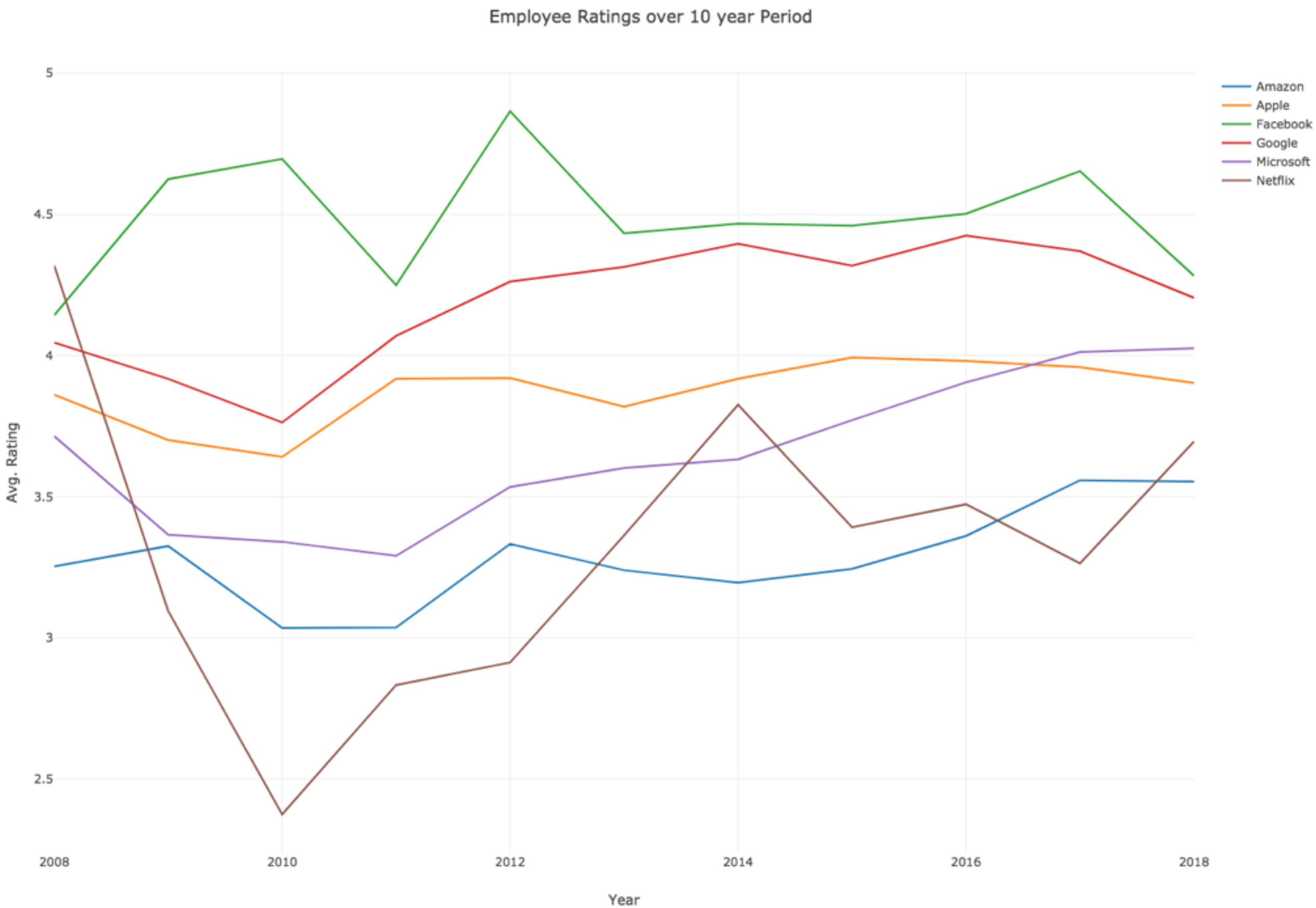
- Overall Rating (1-5)
- Work-Balance Rating (1-5)
- Culture Values Rating (1-5)
- Career Opportunities Rating (1-5)
- Benefits Rating (1-5)
- Senior Management Rating (1-5)
- dates (text + numeric)

Data Prep

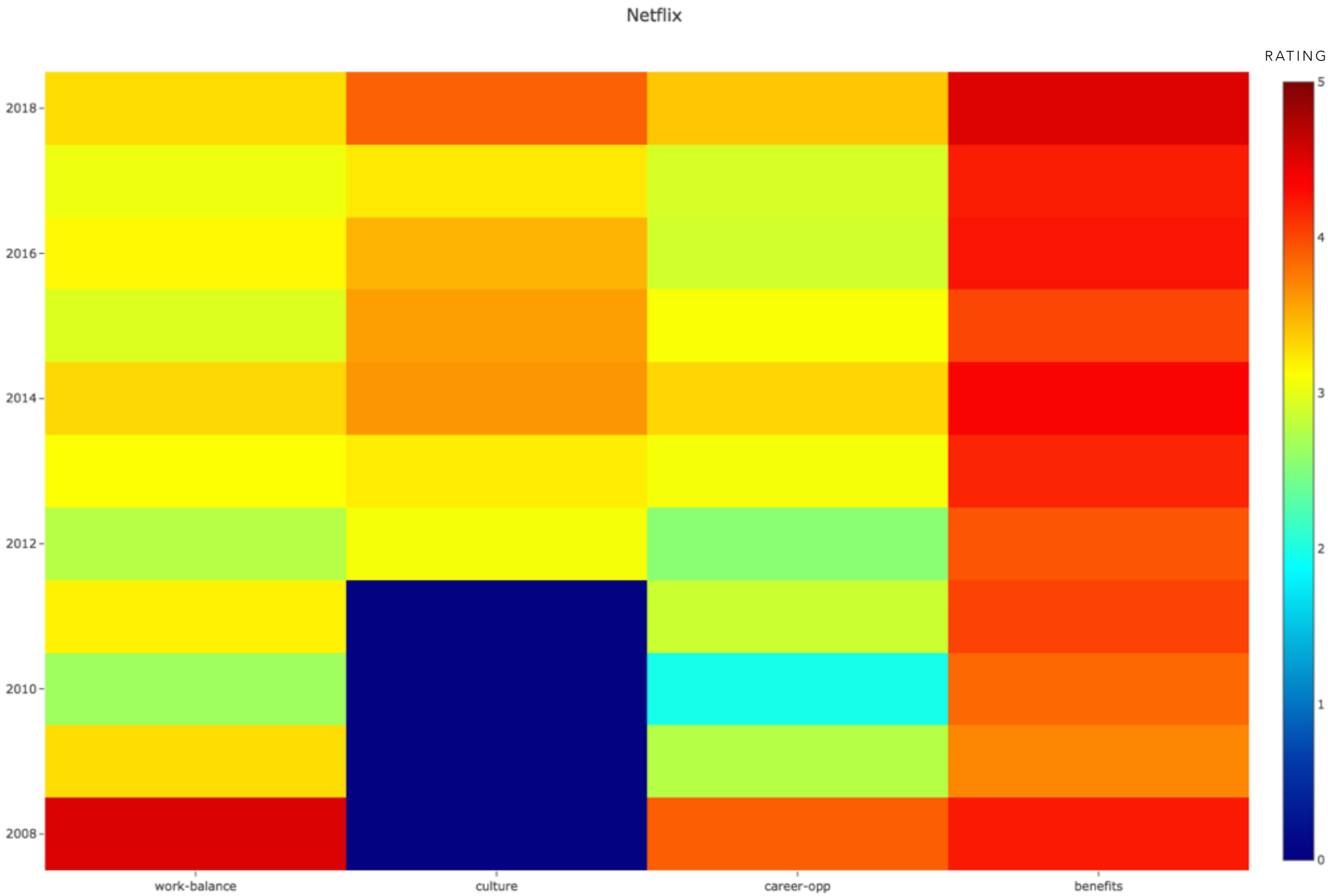
- Compute the mean of each rating category for each company for each year

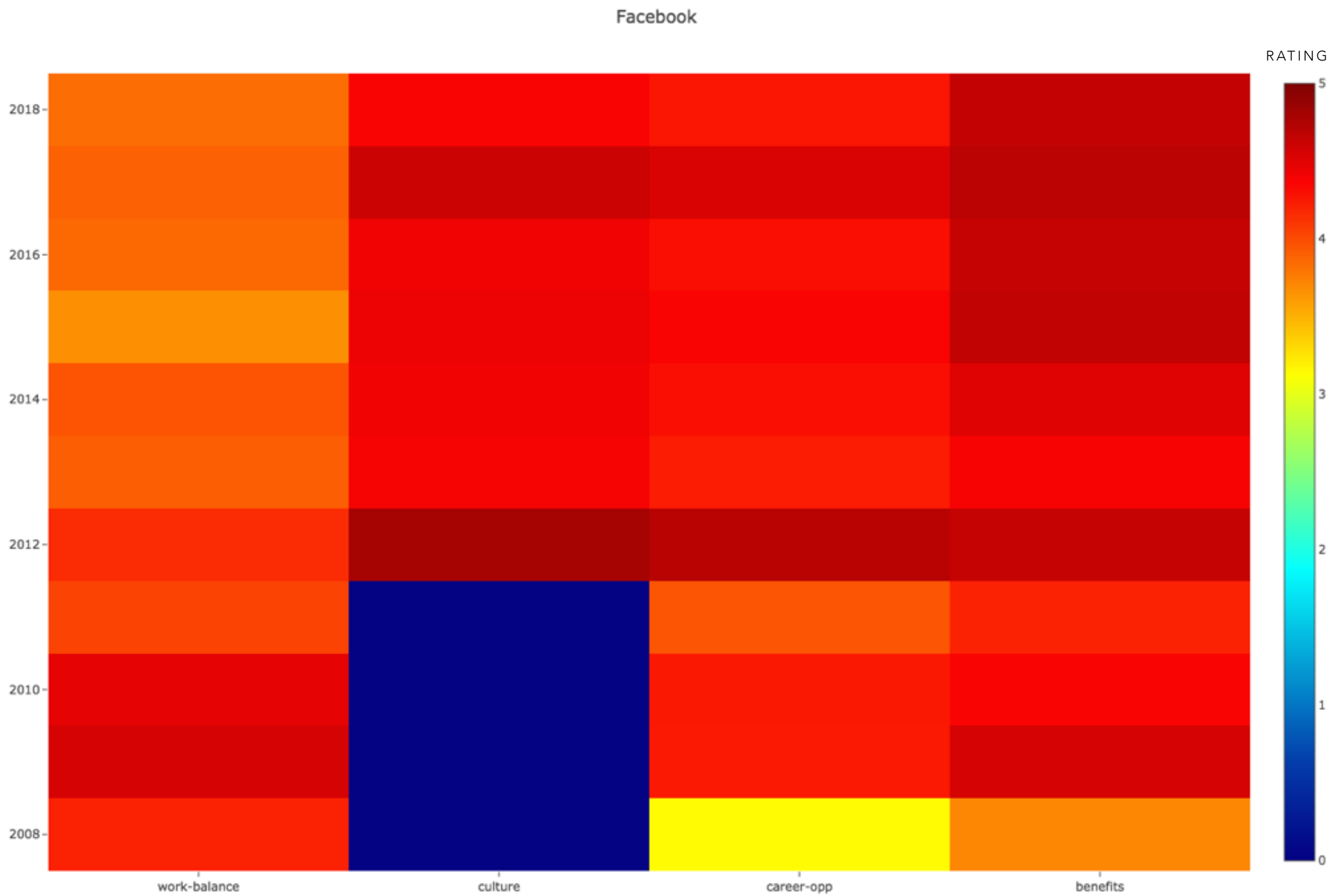
Packages

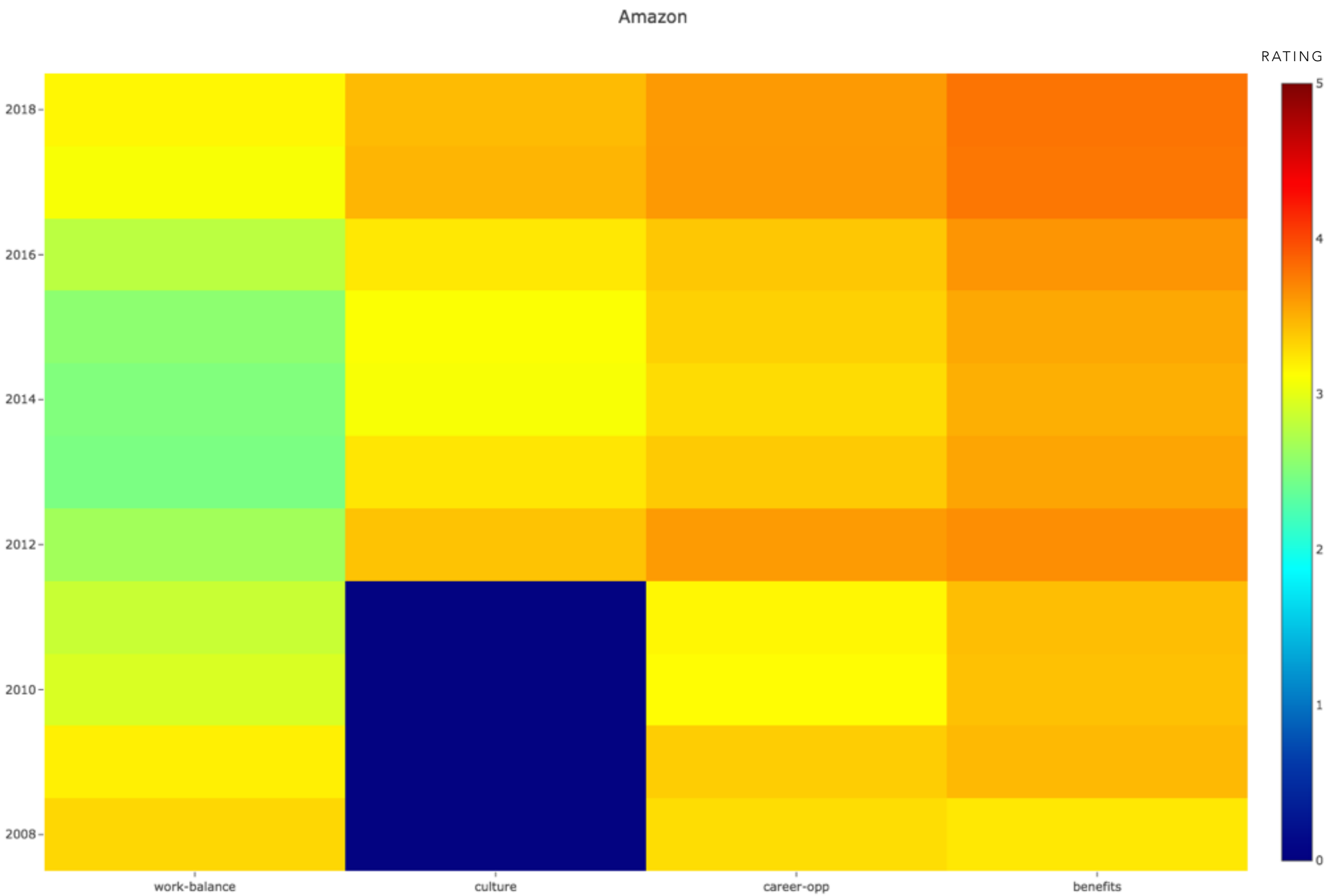
- plotly


Employee Ratings over 10 year Period
Amazon
Apple
Facebook
Google
Microsoft
Netflix
5
4.5
4
3.5
3
2.5
Avg. Rating
2008
2010
2012
2014
2016
2018
Year

- This graph shows the change in overall rating across a 10 year period
- Trends *may* reflect the situation of company at a given period.
- <u>example 1:</u> Amazon has taken a major success in it's business in the recent years. We see a ~0.5 increase in rating
- <u>example 2:</u> Netflix took a huge dip between 2008 and 2010 followed by a huge peak between 2010 and 2014. This could reflect the struggles of initially starting out, as Netflix was not popular in it's early days.
- <u>example 3:</u> Facebook took a dip between 2017 and 2018. This could reflect the data privacy issue and Mark Zuckerberg's senate hearing


Netflix
RATING
5
4
3
2
1
0
2018
2016
2014
2012
2010
2008
work-balance
culture
career-opp
benefits


Facebook
RATING
5
4
3
2
1
0
2018
2016
2014
2012
2010
2008
work-balance
culture
career-opp
benefits


Amazon
RATING
5
4
3
2
1
0
2018
2016
2014
2012
2010
2008
work-balance
culture
career-opp
benefits

- Heat maps show the changes in work balance, culture, career opportunities, and benefits over 10 years.
- Only produced for Facebook, Amazon, and Netflix because of their interesting trends
- Solid dark blue —> data not available for that year
- Netflix: started out really well with 4 to 5 star ratings in all categories in 2008, and then took a huge dip. Only benefits have improved over the 10 year period.
- Facebook: maintained a 4 to 5 star rating over 10 years in all categories. But work balance took a slight dip between 2013 to 2018.
- Amazon: work balance rating between 2010 and 2016 was quite low. Benefits also improved over the 10 years.

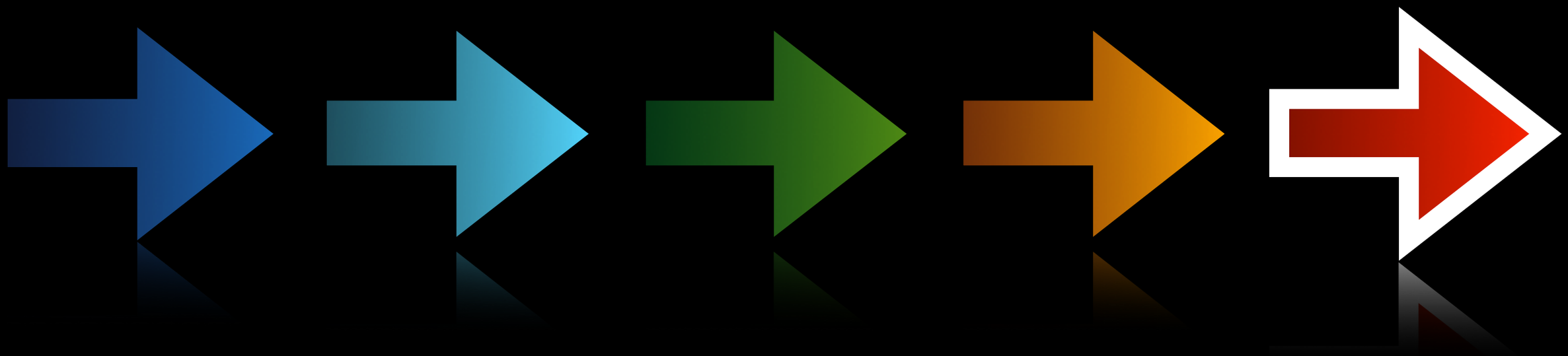
Dataset

Tools

Data preprocessing

Visualizations

CONCLUSION



CONCLUSIONS

- Each company has it's advantages/disadvantages
  - Exploratory Sentiment Study not intended to classify companies as good/bad
- Visuals can be used to improve the current situation of a company and address the complaints of employees
- Challenges
  - Data cleaning/prep - each entry in the data set is inputed by a unique individual leading to various formats and missing values. **Poor data consistency**
  - Making fair comparisons - we can't compare a warehouse worker to a software engineer within the same company. Yet all ratings were used together for analysis. **Difficult to separate ratings based on job title.**

"Happy employees ensure happy customers. And happy customers ensure happy shareholders - in that order"

- SIMON SINEK