Predicting Startup Success

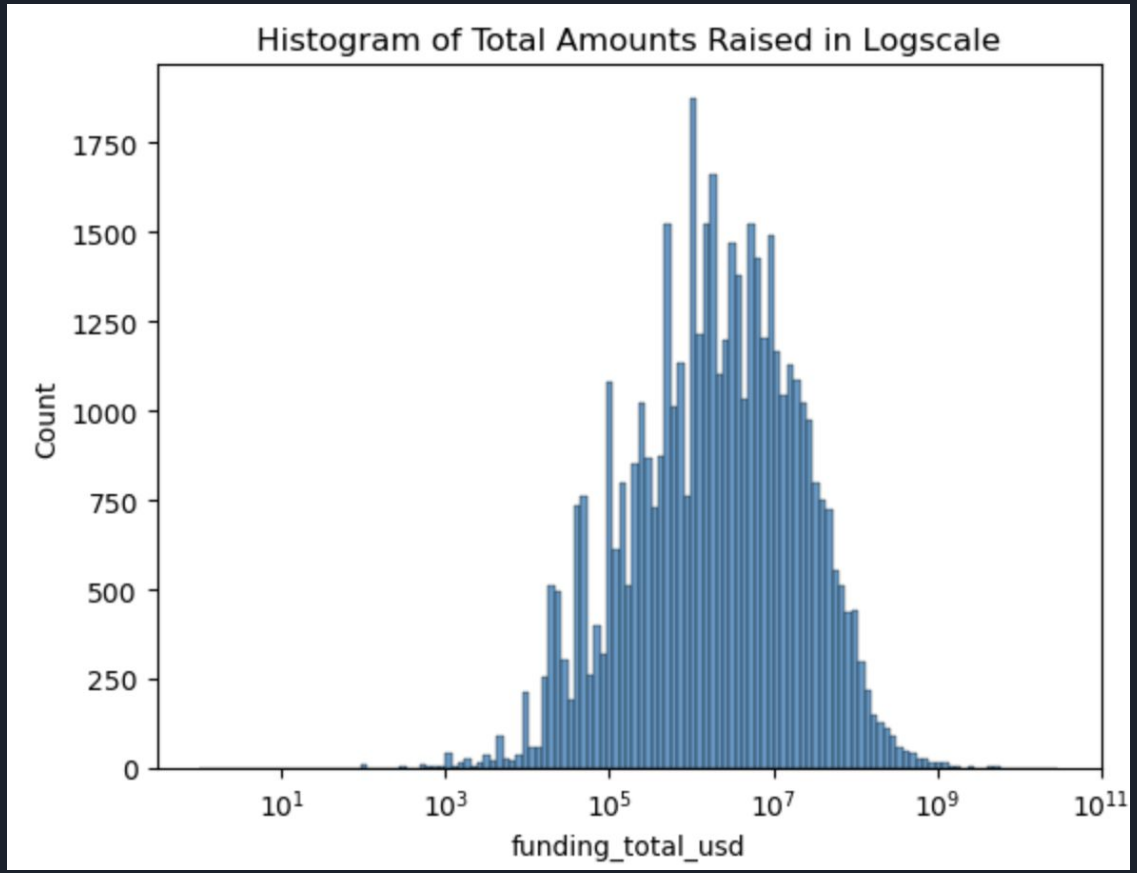
Recap

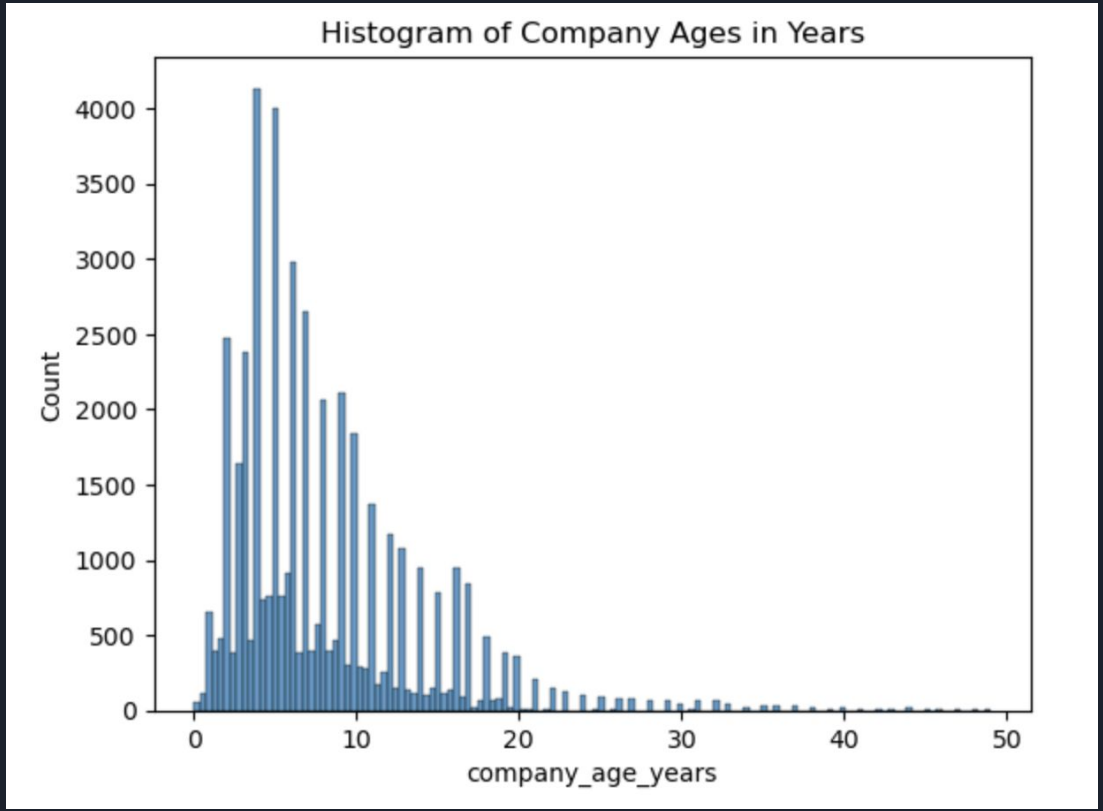
- The goal is to predict the success of any given startup company.
- The challenge is finding adequate data to base this model on - private companies don’t have to publish or submit any information publicly.
- So far I’ve used data (most likely sourced from Crunchbase) which includes information such as category tags (i.e. the industry), location, important dates, funding rounds, and total amount raised by the companies.
- The plan is to analyze companies' descriptions (and logos if possible) as well to see if they produce more accurate or robust models.
- Knowing which startups are better positioned for success could help investors, as well as potential founders.

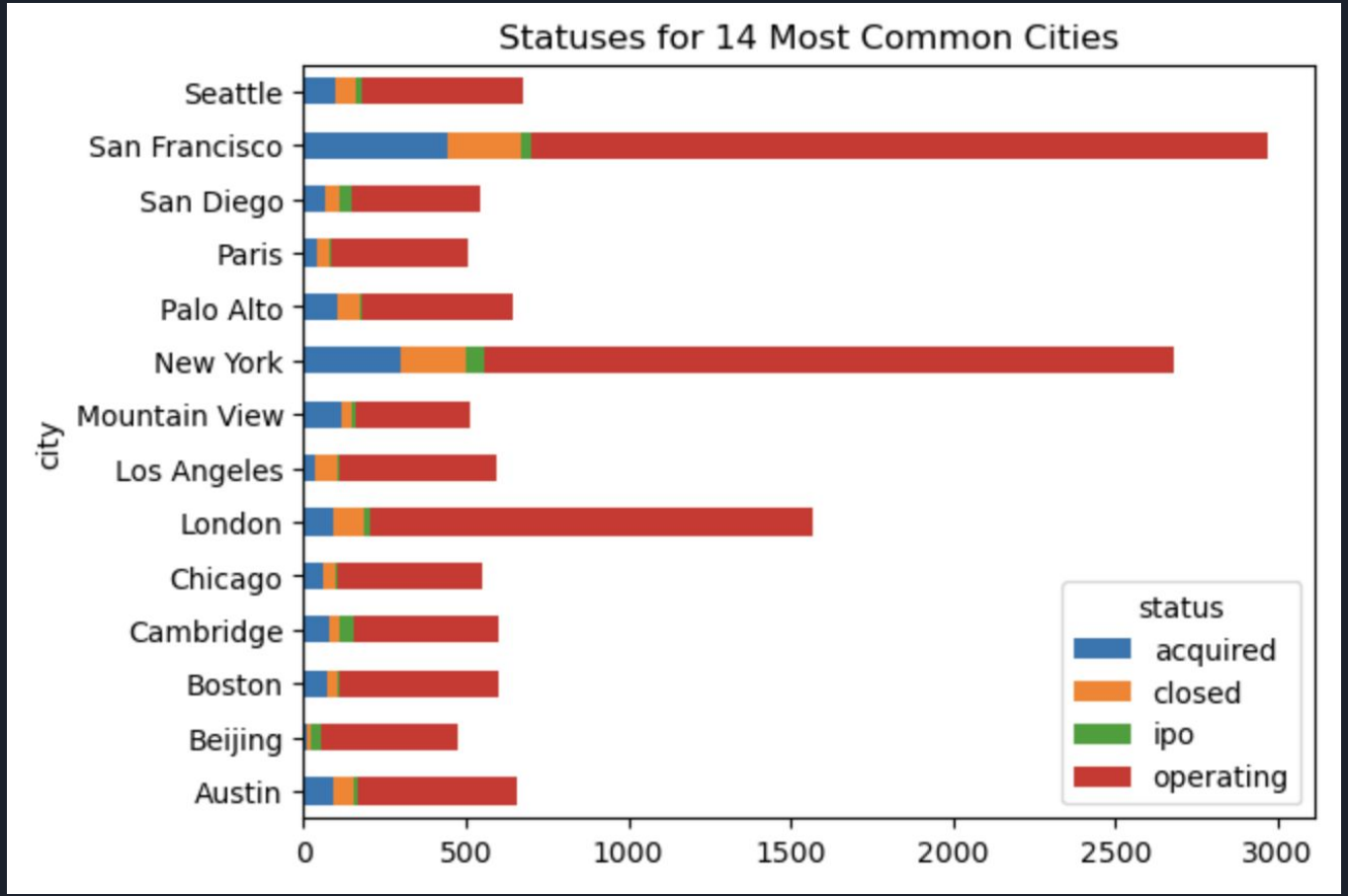
Dataset Overview

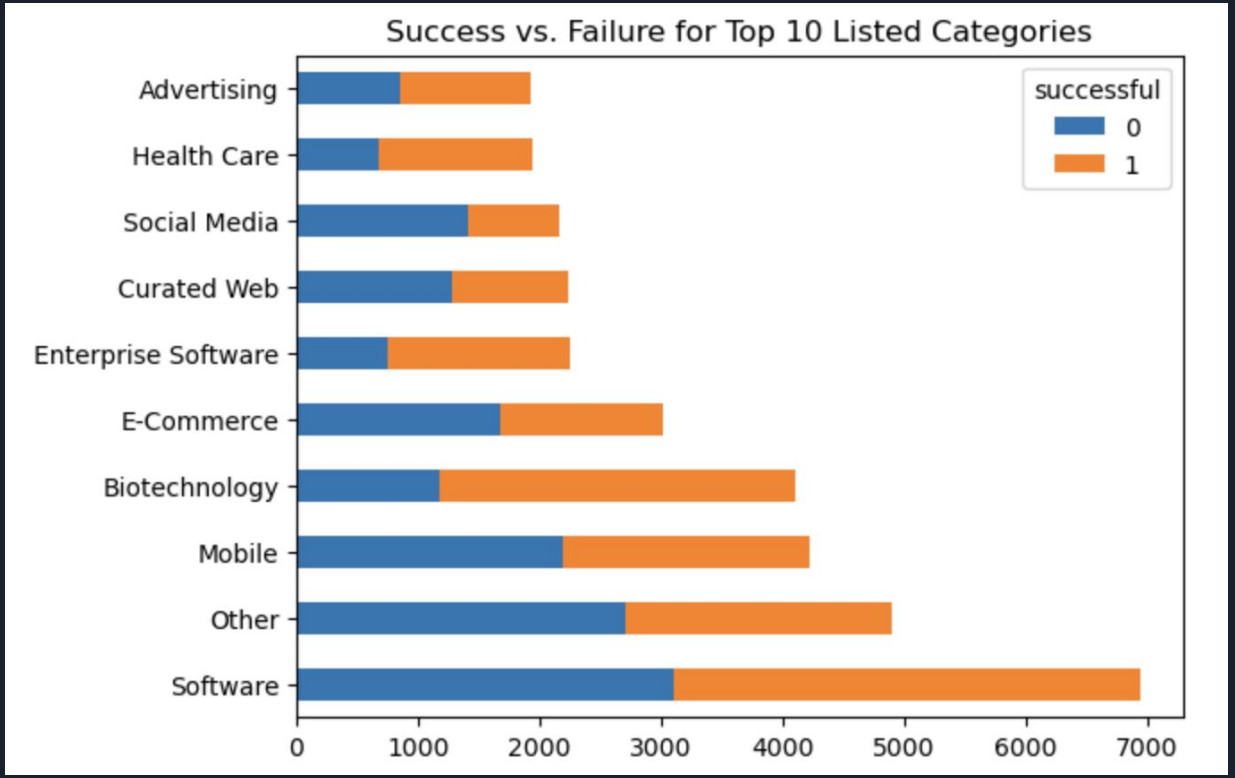
- The data set has locations, industries, starting and funding dates, rounds and amounts.
- The data was cleaned by handling nulls, converting column types, validating timestamps, changing categories to a list.
- Missing values were computed for dates using the average time delta.
- Dates were converted to integers representing days since funding or founding.
- Cities/countries and categories were one hot encoded.
- A success column was created based on the status and funding total columns:
    - A company is successful if it was acquired or IPO'd or is operating and has raised at least 1.7 million dollars.
    - It has failed if it closed or has not raised enough money.

EDA


Histogram of Total Amounts Raised in Logscale
Count
1750
1500
1250
1000
750
500
250
0
10^1
10^3
10^5
10^7
10^9
10^{11}
funding_total_usd

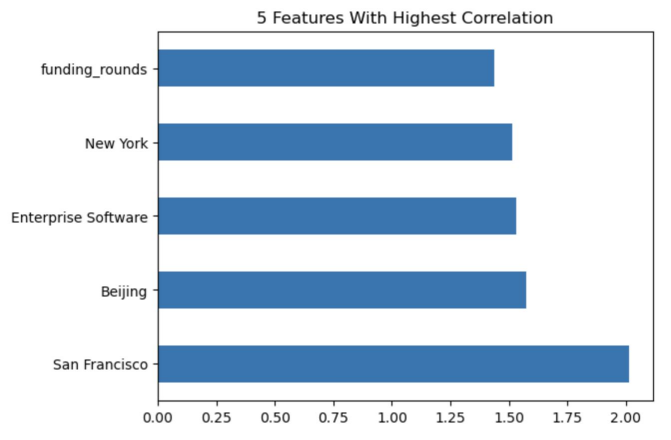

Histogram of Company Ages in Years
Count
company_age_years
0
500
1000
1500
2000
2500
3000
3500
4000
0
10
20
30
40
50

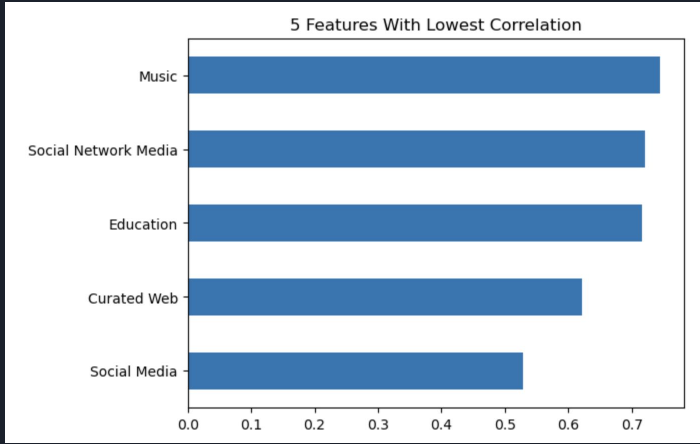

Statuses for 14 Most Common Cities
Seattle
San Francisco
San Diego
Paris
Palo Alto
New York
Mountain View
Los Angeles
London
Chicago
Cambridge
Boston
Beijing
Austin
city
0
500
1000
1500
2000
2500
3000
status
acquired
closed
ipo
operating


Success vs. Failure for Top 10 Listed Categories
successful
0
1
Advertising
Health Care
Social Media
Curated Web
Enterprise Software
E-Commerce
Biotechnology
Mobile
Other
Software
0
1000
2000
3000
4000
5000
6000
7000

Model Evaluation

- Logistic regression model:
  - Training and testing accuracy of 72% - beating the baseline guess accuracy by 22%.
  - Precision = 76.6%, recall = 67.4%, f1 = 71.7%





Next Steps

- Optimizing Hyperparameters and features
- Trying different models
- Incorporating text data of description fields
- Get a status update on the companies using URLs
- Maybe scrape for more data - founders, number of employees, investors, etc.