A Deepdive on STEM Salaries

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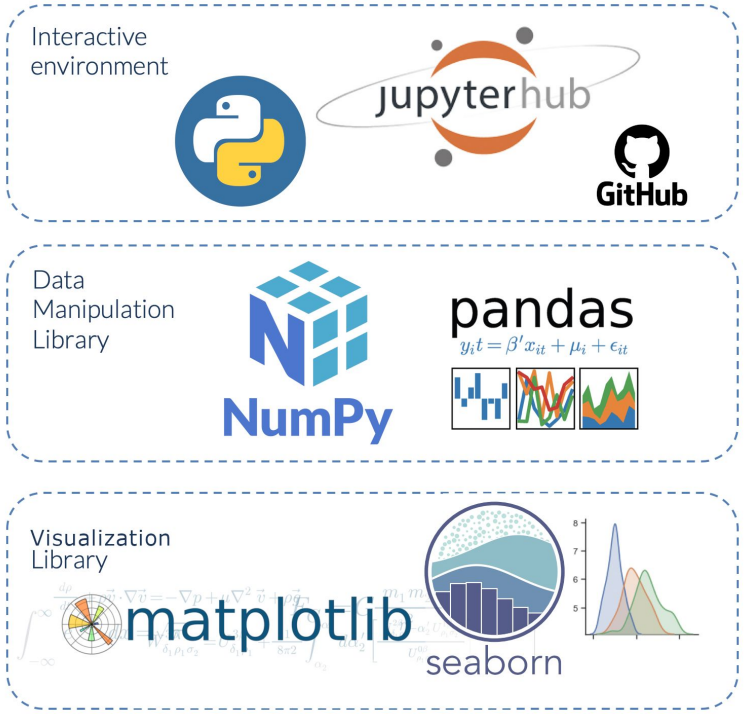
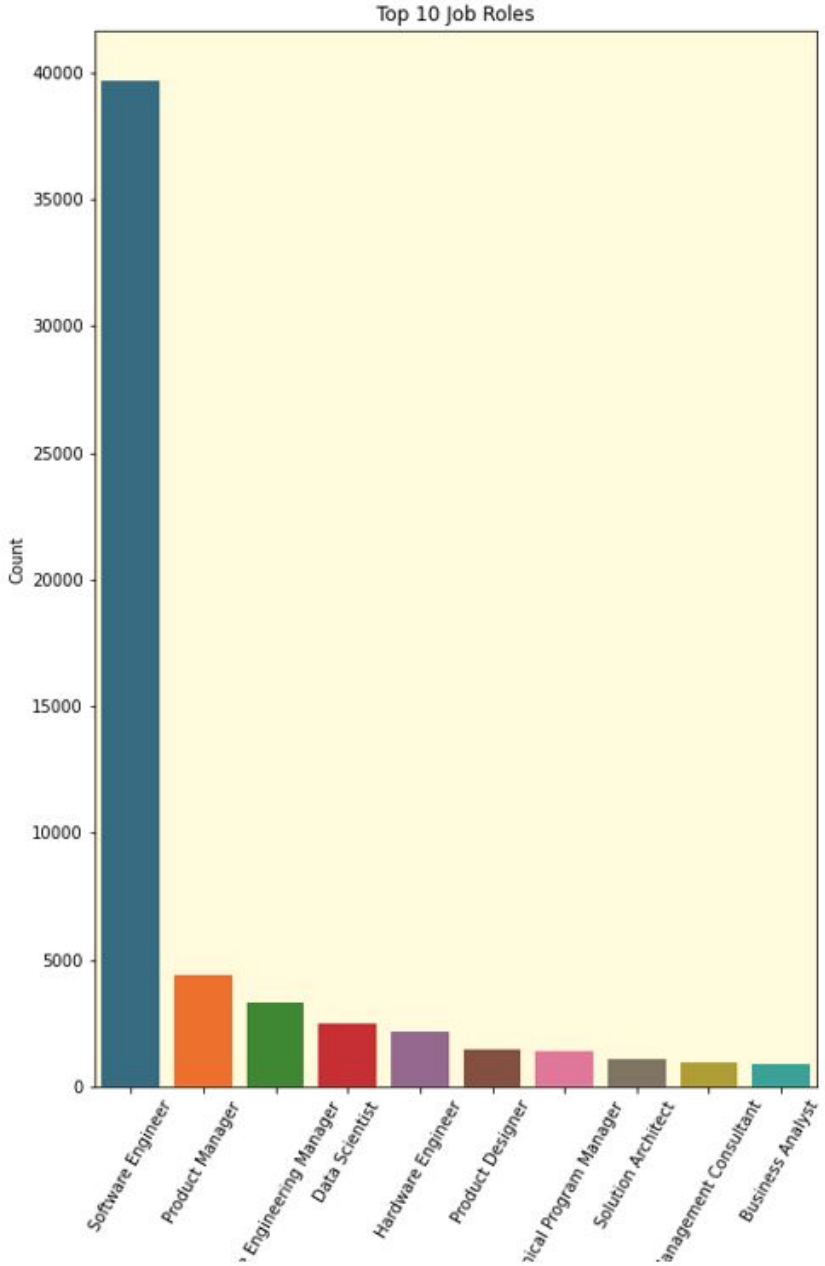
About Dataset (STEM = Science, Technology, Engineering, and Mathematics)

- Kaggle: https://www.kaggle.com/datasets/jackogozaly/data-science-and-stem-salaries
- This Dataset contains data about STEM jobs, job title, location, salaries (base salary, bonus, stock grants), education level, experience, employees race and gender.
- Analyzed 62,642 rows and 29 columns



	timestamp	company	level	title	totalyearlycompensation	location	yearsofexperience	yearsatcompany	tag	basesalary	...	Doctorate_Degree	H
0	6/7/2017 11:33	Oracle	L3	Product Manager	127000	Redwood City, CA	1.5	1.5	NaN	107000	...	0	
2	6/11/2017 14:53	Amazon	L7	Product Manager	310000	Seattle, WA	8.0	0.0	NaN	155000	...	0	
3	6/17/2017 0:23	Apple	M1	Software Engineering Manager	372000	Sunnyvale, CA	7.0	5.0	NaN	157000	...	0	
6	6/22/2017 12:37	Microsoft	65	Software Engineering Manager	300000	Redmond, WA	15.0	11.0	NaN	180000	...	0	
7	6/22/2017 13:55	Microsoft	62	Software Engineer	156000	Seattle, WA	4.0	4.0	NaN	135000	...	0	
9	6/26/2017 21:25	Microsoft	63	Software Engineer	201000	Seattle, WA	12.0	6.0	NaN	157000	...	0	
10	6/30/2017 16:29	Salesforce	9	Software Engineering Manager	450000	San Francisco, CA	16.0	3.0	NaN	230000	...	0	
11	7/2/2017 14:16	Microsoft	Sde 2	Software Engineer	155000	Bellevue, WA	5.0	3.0	NaN	126000	...	0	
13	7/7/2017 22:29	Microsoft	63	Software Engineer	191000	Seattle, WA	7.0	7.0	NaN	152000	...	0	
14	7/14/2017 21:36	Amazon	L6	Software Engineering Manager	287000	Seattle, WA	12.0	1.0	NaN	160000	...	0	

Exploring the data: Top 10 Job Roles Found



-Using cleaned data frame that removed any base salary counts of zero, a new data frame was built, using a top 10 count of job "title". This allowed us to find which jobs appeared the most within our data.

-Based off these findings, we're able to see that "Software Engineers" are in high demand! We can also assess that "data scientist" and "business analyst" also are within the top 10, which is a nice reassurance for us in the Bootcamp that upon graduation, we could be seeing a nice demand for our role/skill set in the job search.

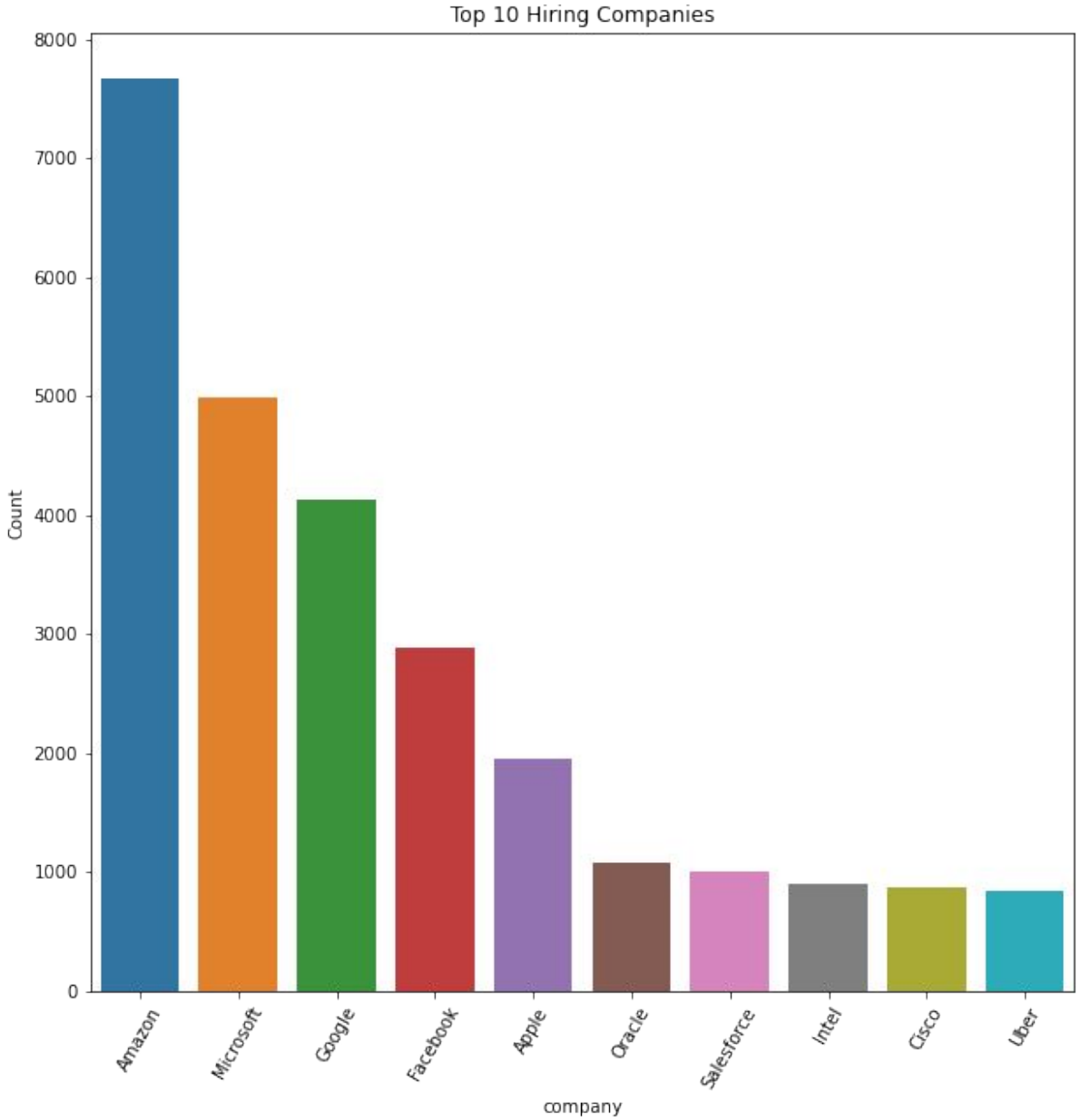
-Results could vary slightly if the above steps were not taken to make a refined data set to work with.

Listed: Software Engineer, Product Manager, Software Engineering Manager, Data Scientist, Hardware Engineer, Product Designer, Technical Program Manager, Solution Architect, Management Consultant, Business Analyst

-Using a year count for job titles that fell under "business analyst" and/or "data scientist", we were able to find that there is significant growth of these roles from 2018 to 2021

2021	1467
2020	1423
2019	441
2018	132

Exploring the data: Top 10 Companies Found

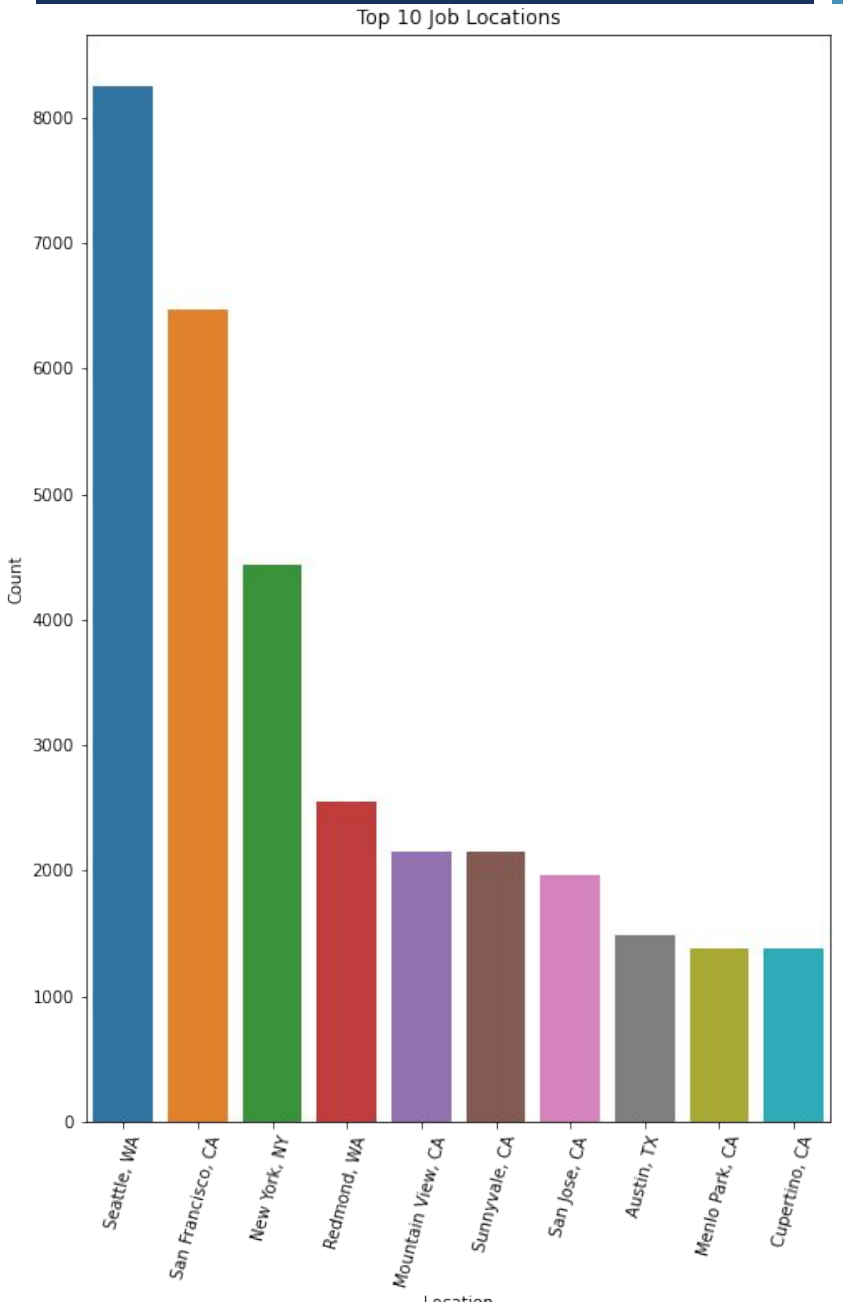


-Using cleaned data frame that removed any base salary counts of zero, a new data frame was built, using a top 10 count of "company".

-This allowed us to find which companies appeared the most within our data, and could be a further means of interest in seeing which roles these companies are hiring for if they are relevant to our skills.

-Results could vary slightly if the above steps were not taken to make a refined data set to work with.

Exploring the data: Top 10 Locations Found



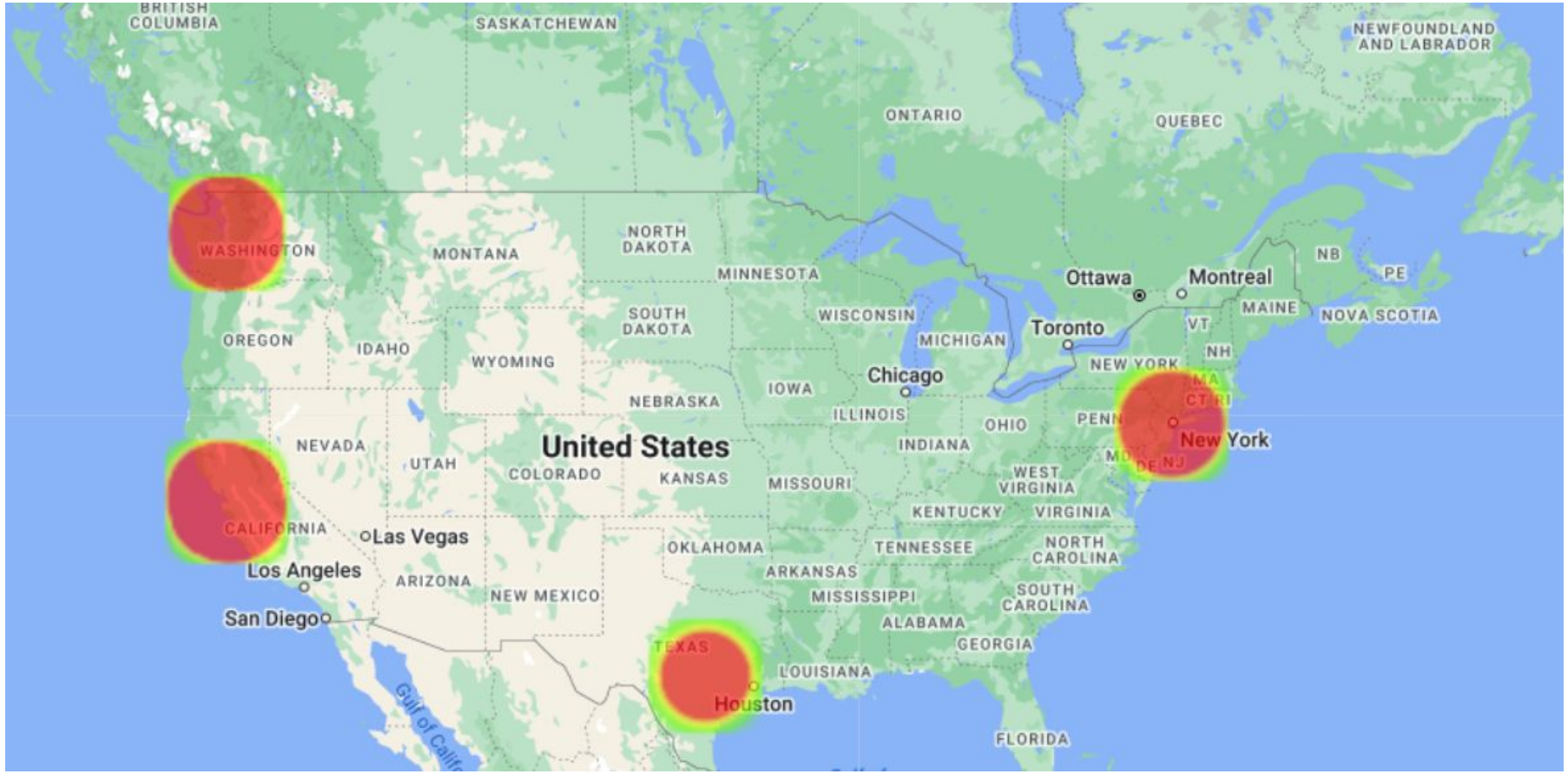
-Using cleaned data frame that removed any base salary counts of zero, a new data frame was built, using a top 10 count of "location".

-This allowed us to find the most common job locations within this data.

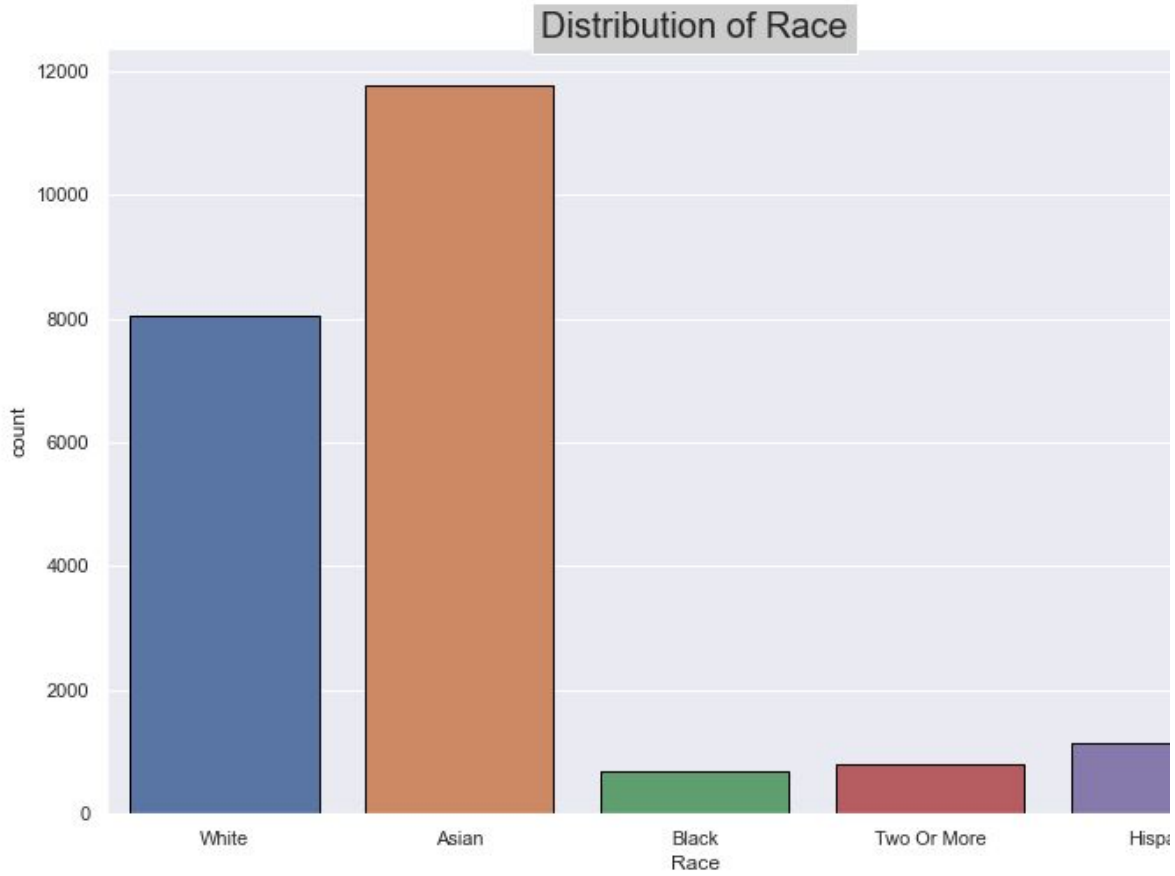
-Results could vary slightly if the above steps were not taken to make a refined data set to work with.

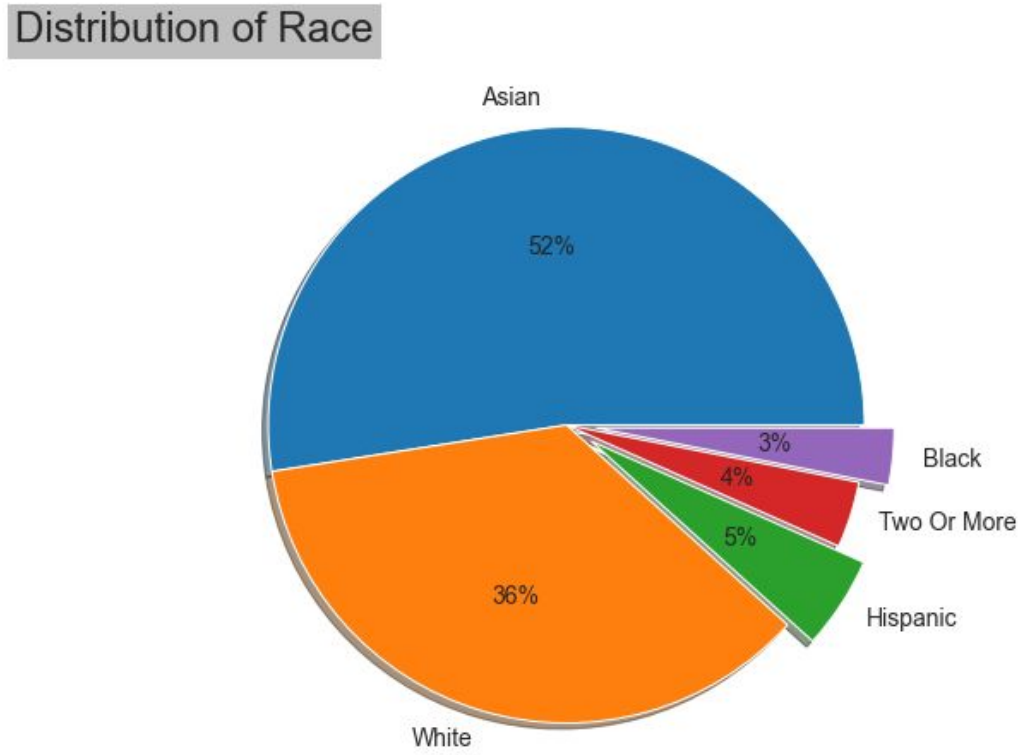
Other areas to explore for future study: Base salaries of each company, breakdown comparisons of top 5 companies where we can examine/compare stock options provided, bonus options provided, and account these factors within their total yearly salary to see which company and role pays the "best".

Exploring the data: Top 10 Locations Found

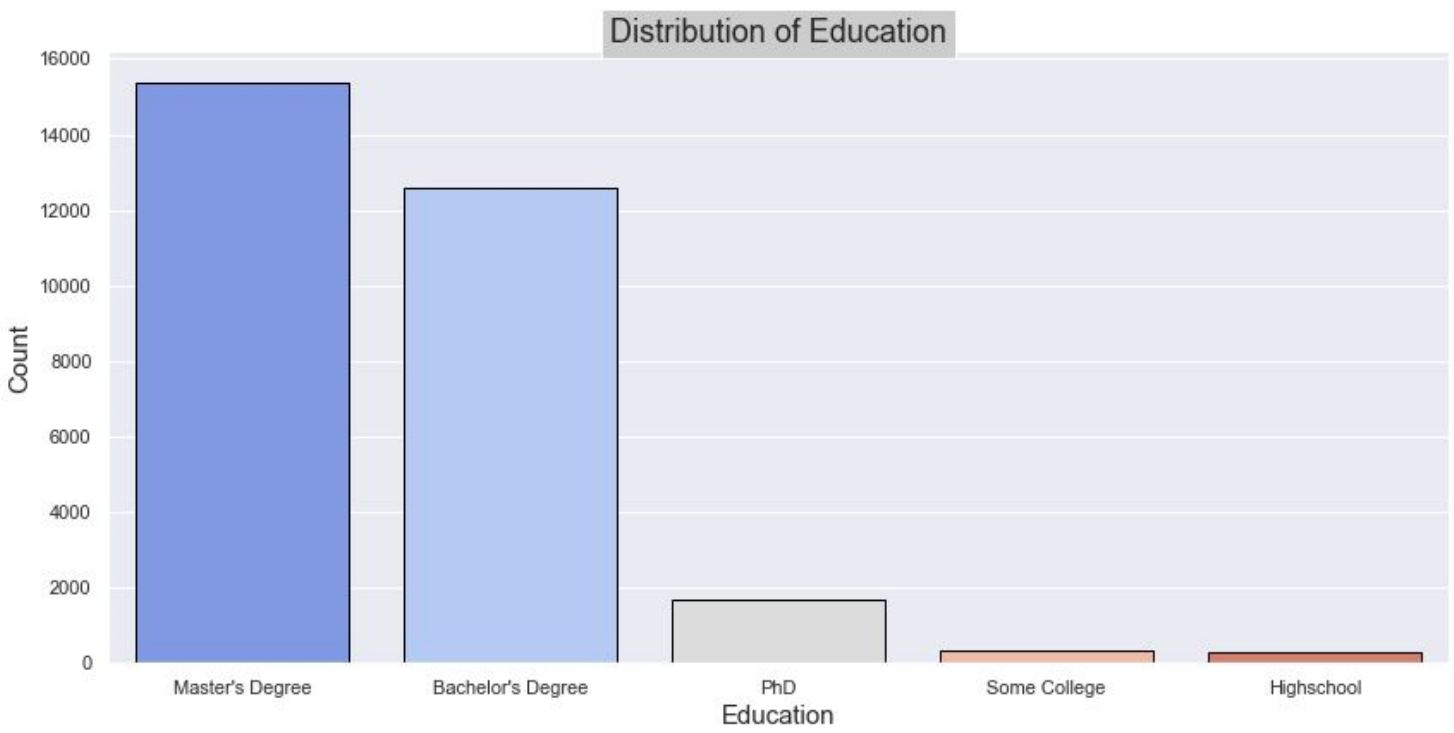


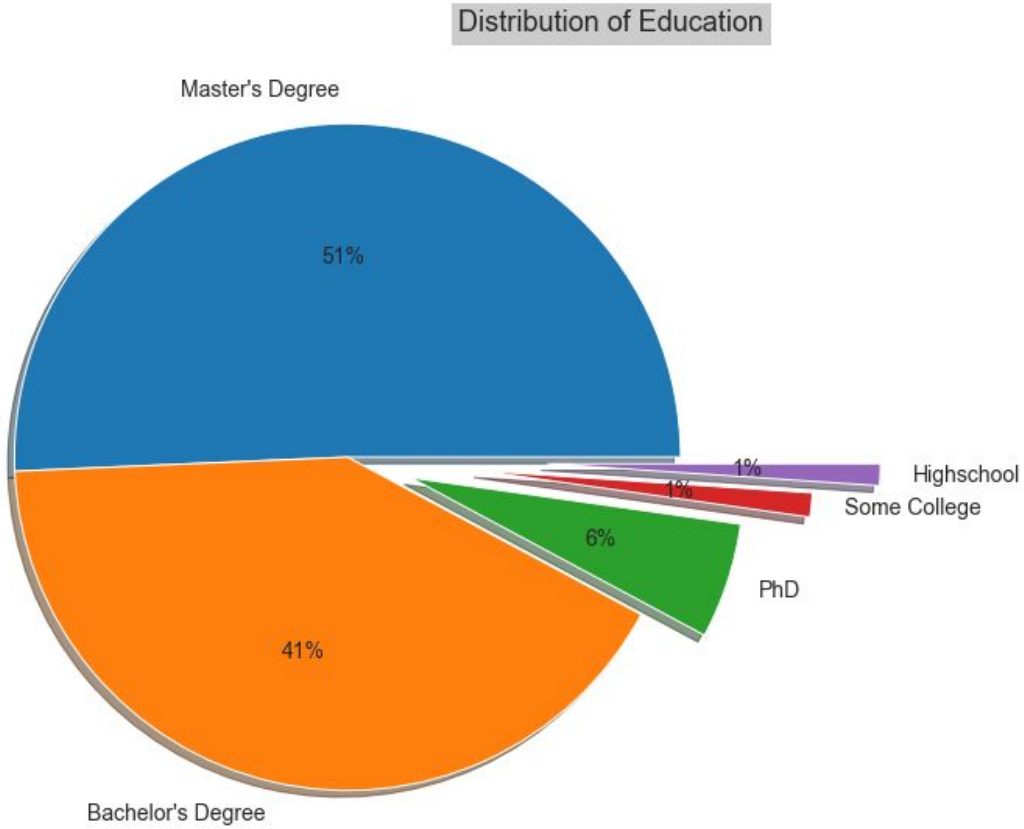
Distribution of race in jobs





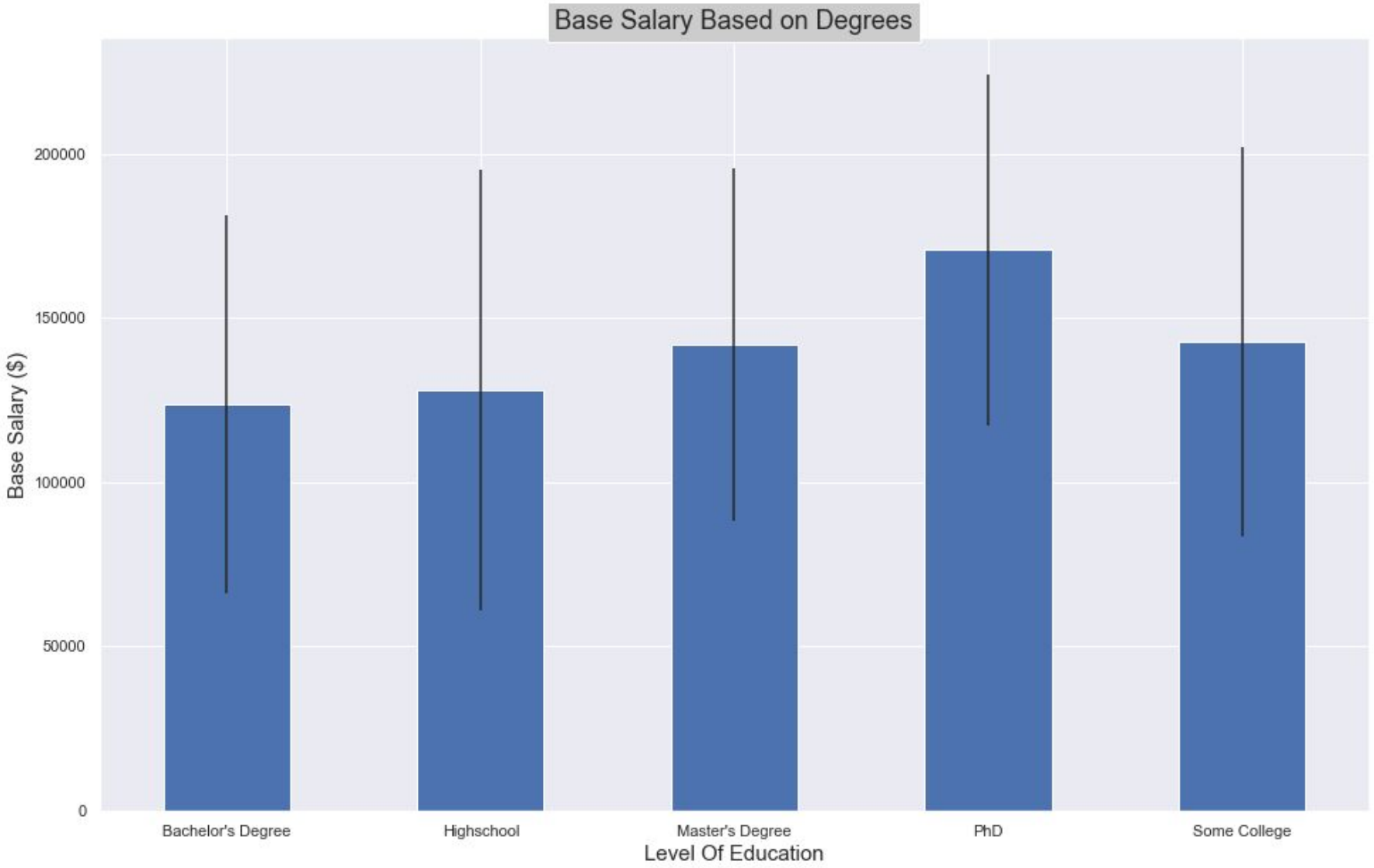
Relation Between Education Degree And Job Count





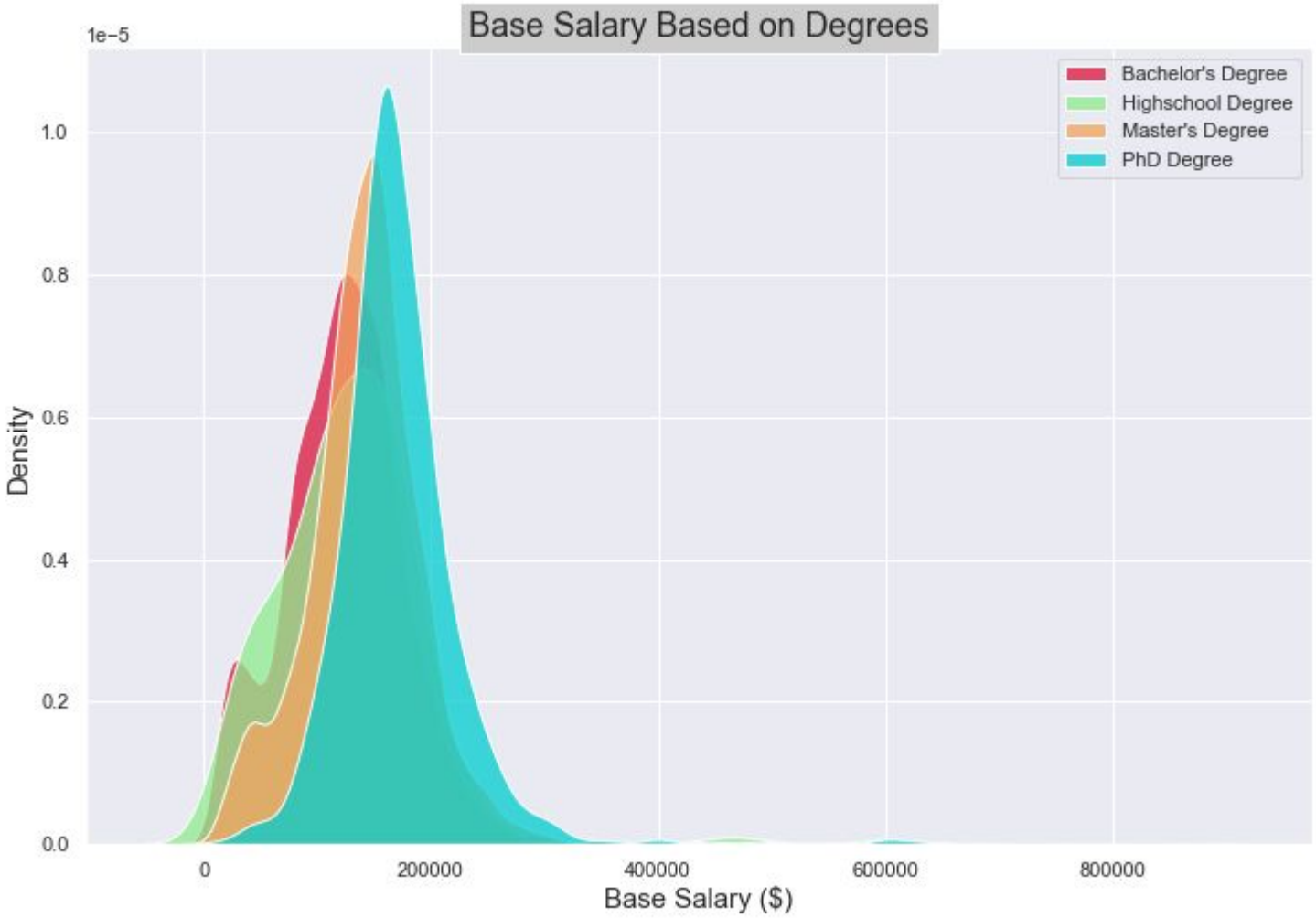
Work experience can make you a good match for a particular job, but you may lack the essential skills for advancement tomorrow without higher education.

Base Salary Based on Education Level



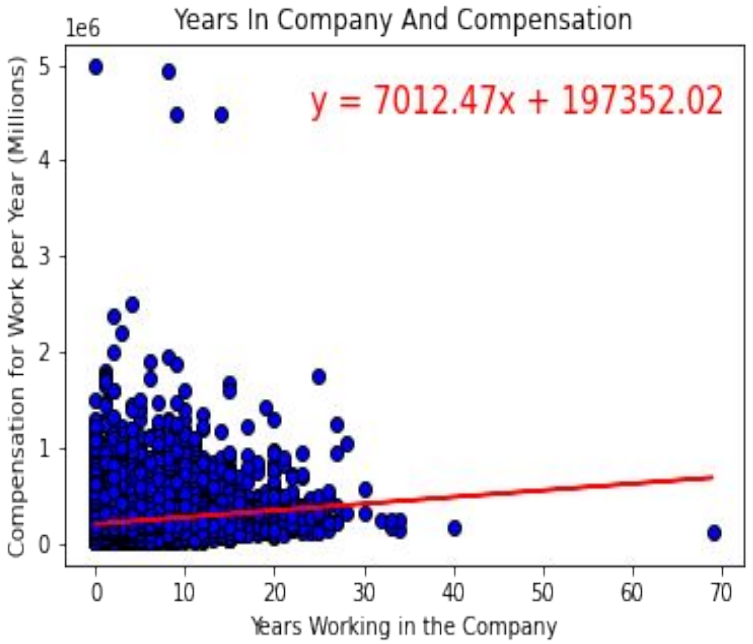
- Most of the people working in STEM and Data Science have a Master's Degree.
- More education often leads to better job stability and pay.

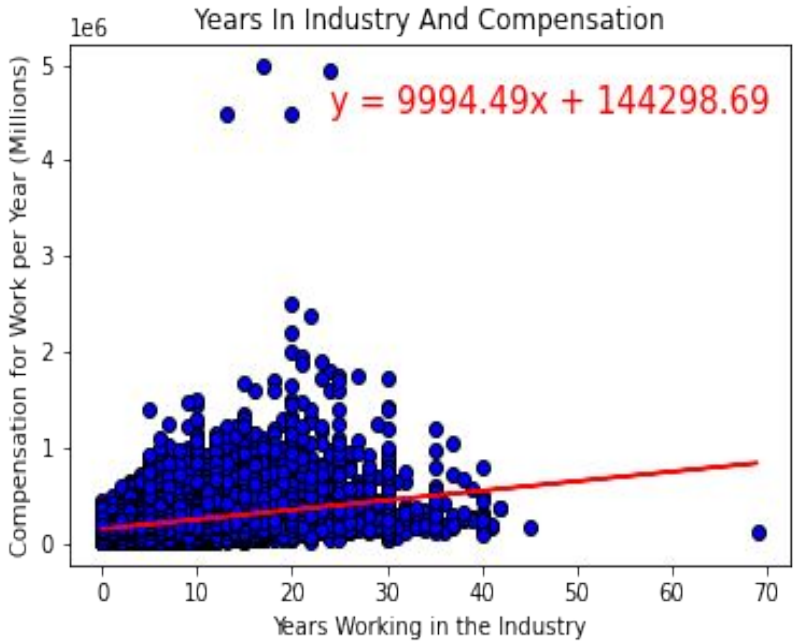
Base Salary Based on Education Level



- Is Ph.D Degree Worth it?
- Educational attainment and income are closely correlated, with higher degrees typically leading to higher salaries.

Time In Tech Industry/ Company Vs Pay



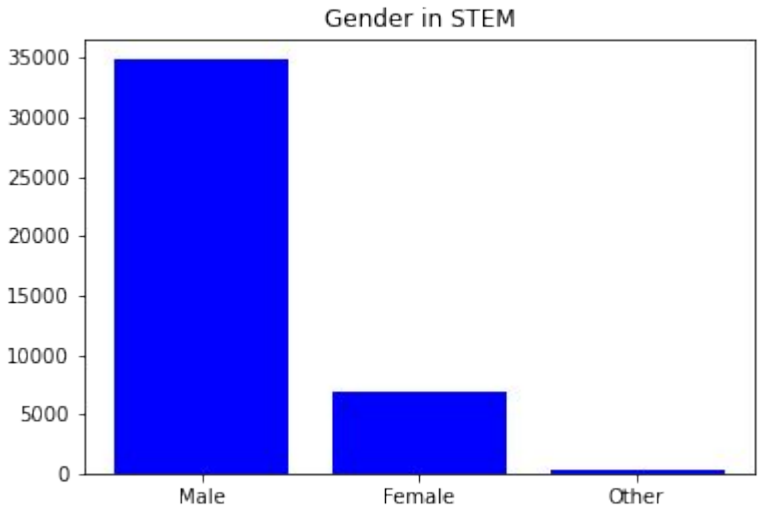


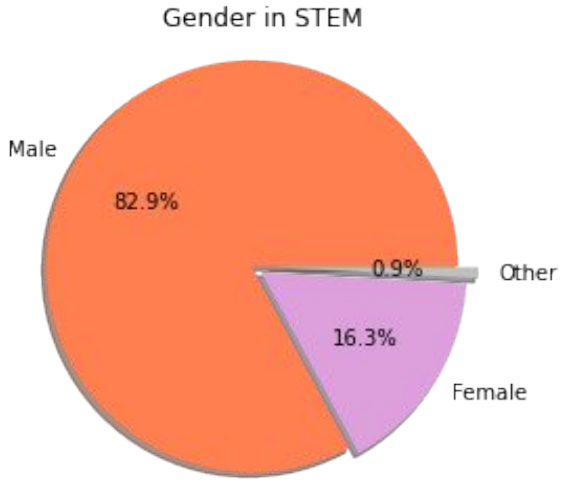
-Working in the industry increases faster than working in a company does.

-Companies seem to have higher start pay than working in the industry.

-Outliers may skew the data more than expected.

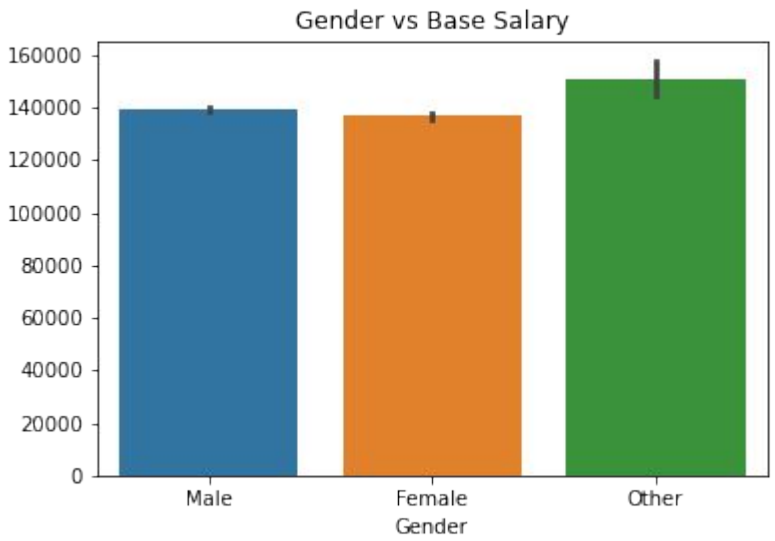
Gender in STEM

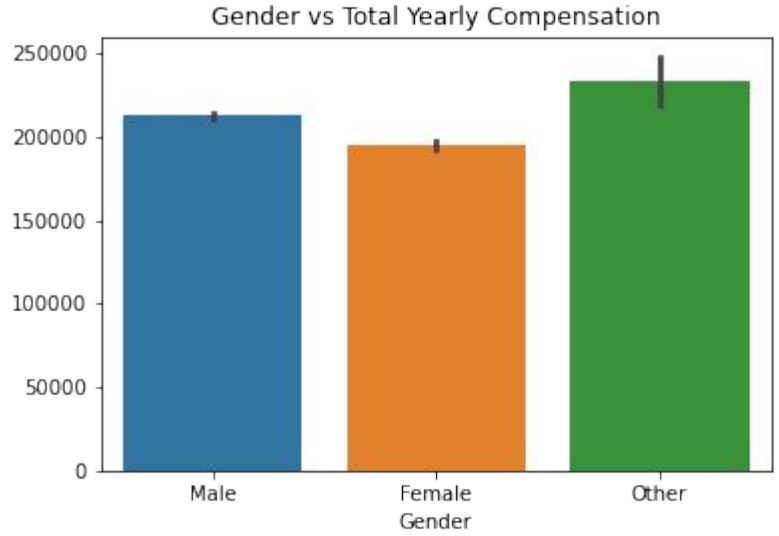




- Dataset indicated 5 categories for genders: “Female” (6,999), “Male” (35,702), “NA” (19,540), “Other” (400), “Title: Senior Software Engineer” (1)
- Removed “NA” and “Title: Senior Software Engineer” and base salary of $0.
- STEM Jobs are heavily dominated by Male.
- The biggest hurdle is incomplete data which does not give us the full view of gender in STEM roles.
- There is a big gap between Male and Female in STEM roles but that gap will be closed in the future as we can see more Female in STEM roles.

Gender vs Base Salary / Total Yearly Compensation





- Annual salaries between Males and Females are similar.
- Due to incomplete data, it would be great to see which gender the “Other category is. Once that is defined it can give us a better picture.
- This dataset covers STEM Jobs from 2017 to 2021. STEM jobs have increased from 2019-2021 and more Females have been hired in those 2 years than Males.
- A prediction can be made that in the future the gap between Males/Females salaries will be narrowed.

Summary

- This data concludes that Amazon is the biggest employer of STEM. Software Engineers the most common STEM job. Seattle, Washington is the most common location for most STEM jobs.
- STEM Jobs have been increasing in the past 2 years and is expected to keep growing.
- STEM sector gets bigger and bigger, more specialists with higher education are helpful.
- Most of the people working in STEM and Data Science have a Master's Degree, followed by a Bachelor's Degree.
- Race: Asian has a Dominance in Race Factor.
- Gender does not have an impact on average salary in STEM. But there are more Males employed than Females.
- If we had more time, we could have done a more deep dive with which company offers the most money, stock options, bonuses.
- Cleaning this dataset was required as there was a lot of missing data and it caused biased results.

THANK YOU