STEM Salaries in US

By MSBA Group 1

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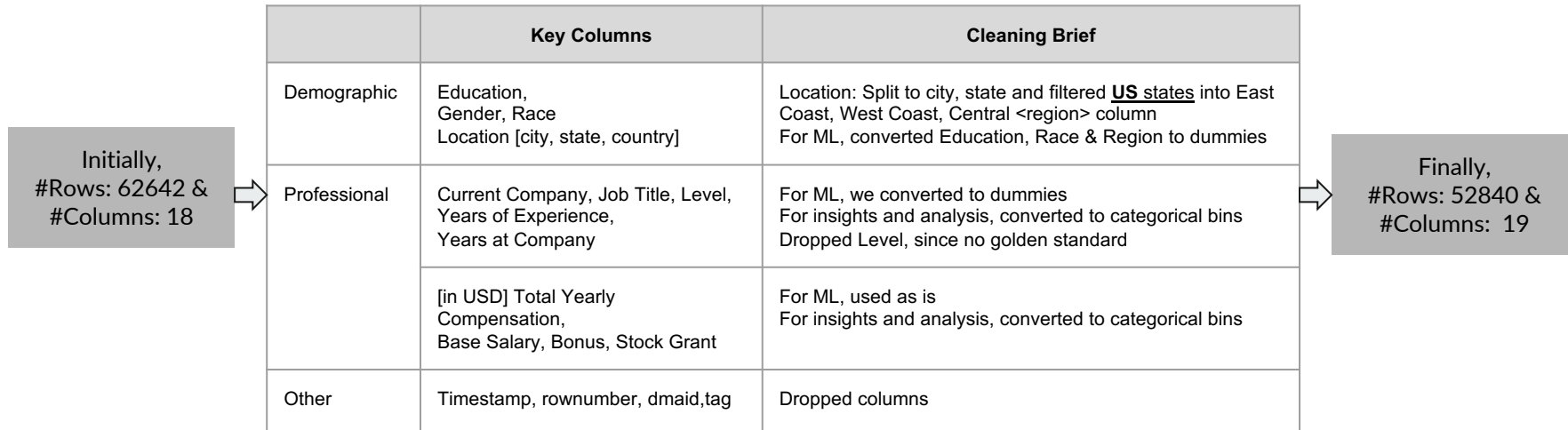
What we are going to talk about:

- Data Overview
    - Data Description
    - Data Cleaning brief

- Three Key Insights:
    - Is a Masters or PhD worth it?
    - Is Loyalty to a company a reward or penalty?
    - Is there *really* a gender pay gap in STEM field?

- Data Science Career [Extra]

- Q&A

Data Description

Source: Kaggle - Data Science & STEM Salaries, scraped off from levels.fyi

	Key Columns	**Cleaning Brief**
Demographic	Education, Gender, Race Location [city, state, country]	Location: Split to city, state and filtered **US** states into East Coast, West Coast, Central <region> column For ML, converted Education, Race & Region to dummies
Professional	Current Company, Job Title, Level, Years of Experience, Years at Company	For ML, we converted to dummies For insights and analysis, converted to categorical bins Dropped Level, since no golden standard
	[in USD] Total Yearly Compensation, Base Salary, Bonus, Stock Grant	For ML, used as is For insights and analysis, converted to categorical bins
Other	Timestamp, rownumber, dmaid,tag	Dropped columns

Initially, #Rows: 62642 & #Columns: 18

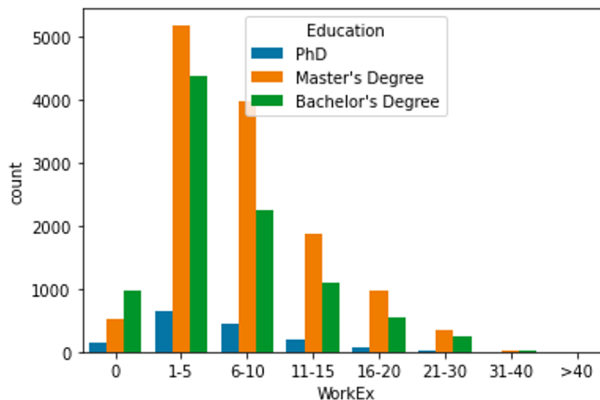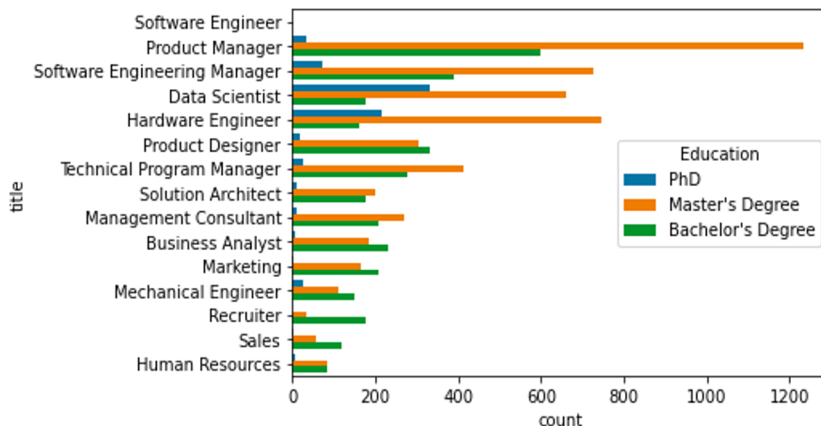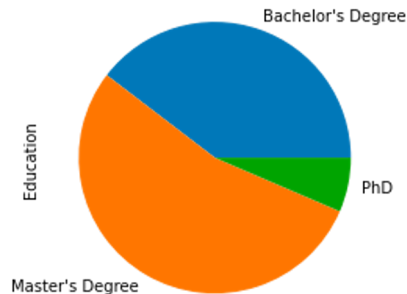Finally, #Rows: 52840 & #Columns: 19

Insight #1:

Is a Masters or PhD worth it?

Quick Look on Education

- 50% records had education, of which >50% is Masters Degree

- Role: As level of Education rises, people get into specialised technical fields
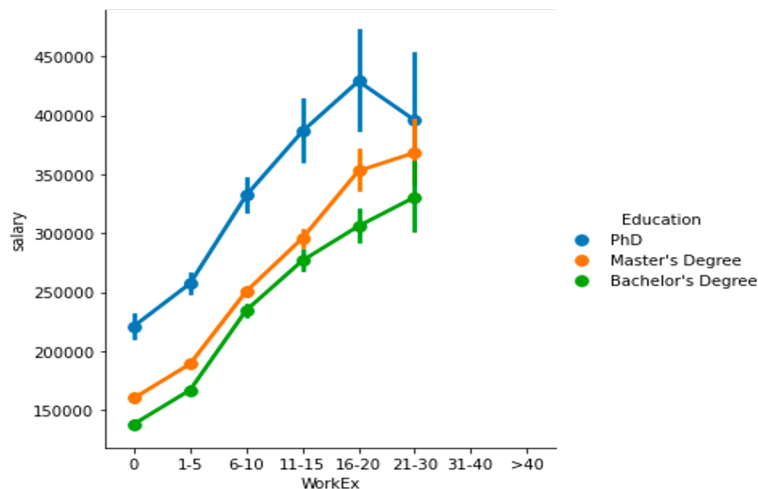Eg. most PhD only in Software, Hardware & Data Science

**30+ years of experience has <100 records. Removed for analysis.

*Software Engineer is highest, but numbers is removed because it was 4X higher and skewing the scale

So, is a Masters or PhD worth it?

1. For Master's, the salary is **10% higher** than Bachelor's on average, but there's a **15% jump after 15 years** of Work Experience

2. For PhD, the salary is **30% higher** than Masters. Difference is not just in the beginning years, but even with higher experience.

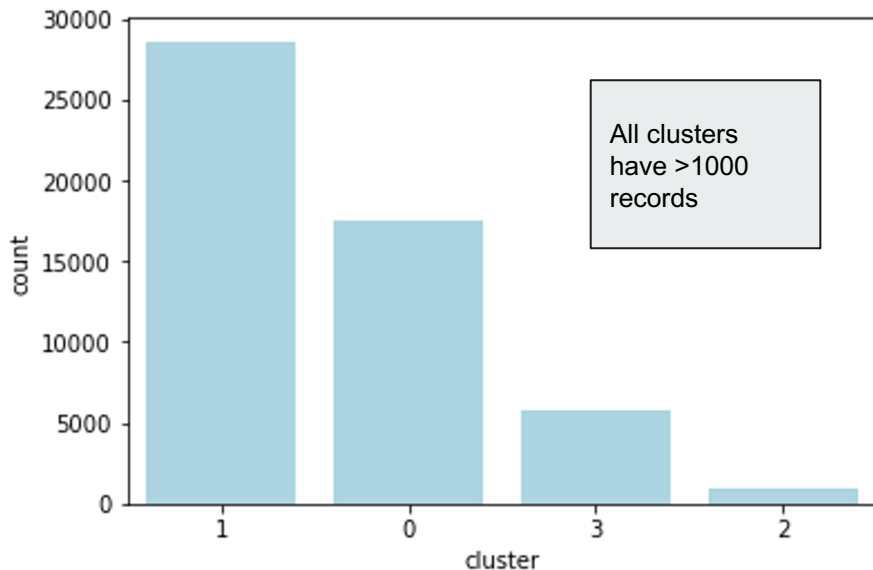| cluster	Salary	Years of Experience	Bachelors Degree	Masters Degree	Doctorate Degree
2	$823,811.09	15.13	0.110	0.222	0.080
3	$447,412.24	11.77	0.127	0.248	0.062
0	$270,385.53	9.02	0.142	0.265	0.042
1	$152,788.16	5.02	0.215	0.231	0.016

Yes, it *is* worth it! For Masters, differentiation is more so in the long run.

But, a PhD could catalyse the career throughout.

Insight #2:

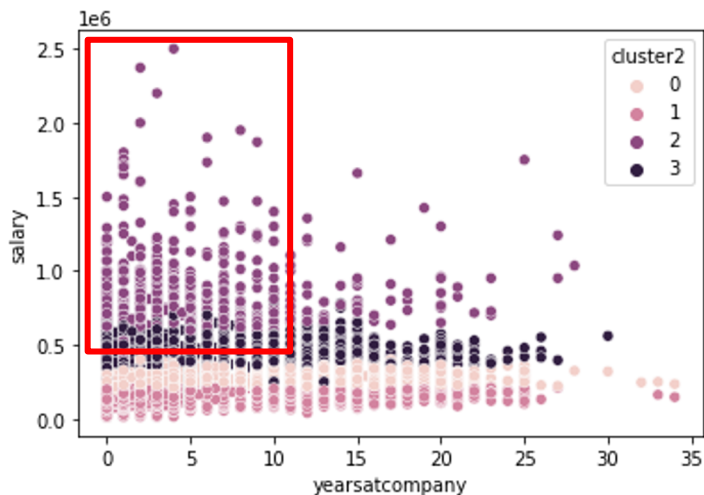**Is Loyalty a reward or penalty?**

Quick Look on Clustering

All clusters have >1000 records

Key Differentiator in clusters:

cluster	Yearly Salary	Years of Experience
2	$823811.09	15.13
3	$447412.24	11.77
0	$270385.53	9.02
1	$152788.16	5.02

As expected, #records in each higher salary band is decreasing

	Columns Used
Salary	base, bonus, stock grant
Work Ex	Years of Experience, Years at Company
Education	Masters_Degree, Bachelors_Degree, Doctorate_Degree
Location	region_Central, region_West, region_East
Gender & Race	gender_Female, gender_male, gender_Other, race_Asian, race_White, race_Black, Hispanic, Two or More

So, is Loyalty a reward or penalty?

cluster	Yearly Salary	Years of Experience	Years at Company
2	$823811.09	15.13	4.5
3	$447412.24	11.77	3.5
0	$270385.53	9.02	3.2
1	$152788.16	5.02	2.3

- While overall Work Experience is highly correlated with salary (44%), there is only a 16% correlation between Years at a company and Salary.

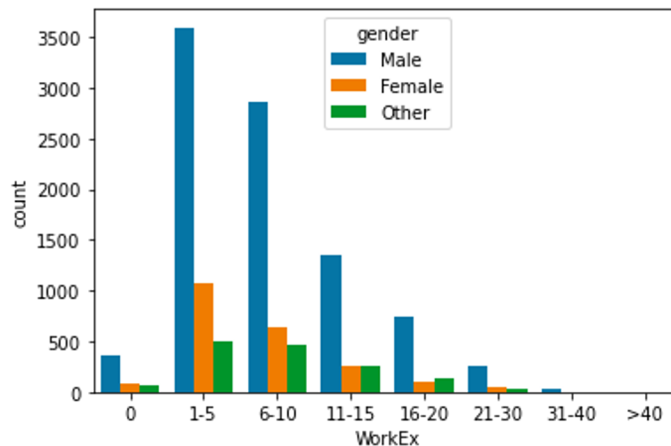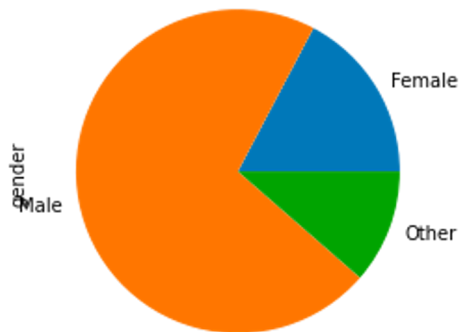No, not so rewarding! To earn more than $400K, move on to the next challenge after 3-5 years.

Insight #3:

Is there *really* **a gender pay gap in STEM?**
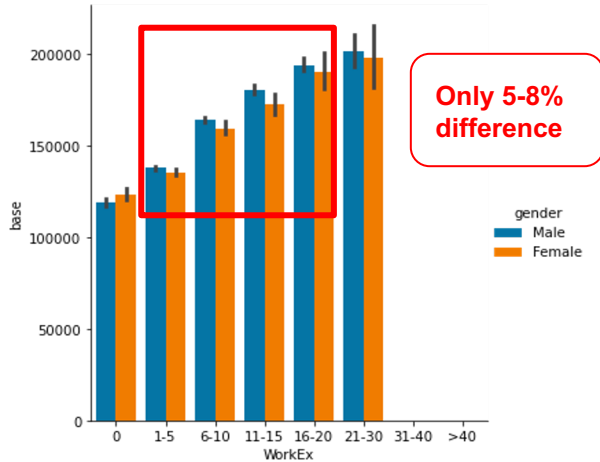
Quick Look on Gender Data

- Normalizing for same Education and Work Experience levels.
- Below data split for Masters Degree Students alone:
    - Nearly 70% is Male
    - Work Ex: Will focus on first 20 years of career, since the Female data becomes <100 post.
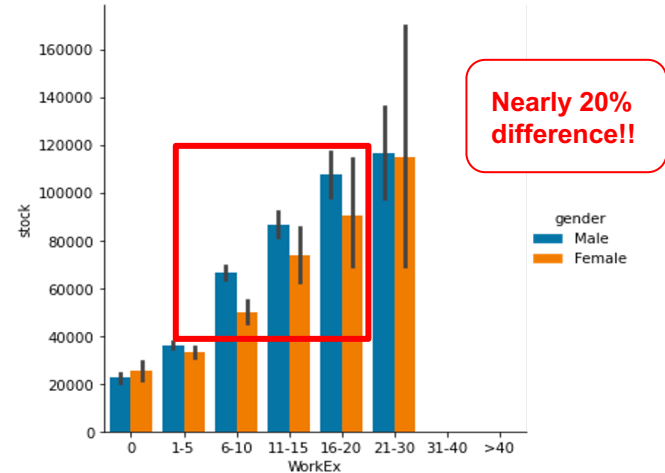
So, is there a gender bias in STEM?

Base Salary

Only 5-8% difference

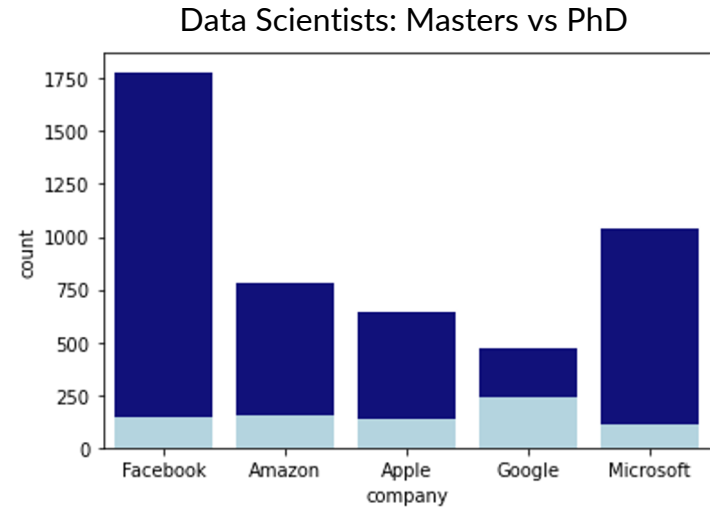Stock Grant

Nearly 20% difference!!

Yes, stock options cause the bias primarily.
While the pay starts off on equal footing, men get ~18% more stock after 5+ years of Work Experience.
Girls, negotiate better on stocks!

[Extra] How does a career in Data Science look like?

- *Good News:* Right place to earn. West Coast earn more than East Coast. Again, the difference comes in stocks.

- *More Good News:* Most major companies recruit more Masters candidates, compared to PhD. Although, Google is an exception.

- Decreasing order of Yearly Compensation: Facebook > Google > Apple > Amazon > MS

Data Scientists: Masters vs PhD

Hope you got a STEM career perspective.

All the best!