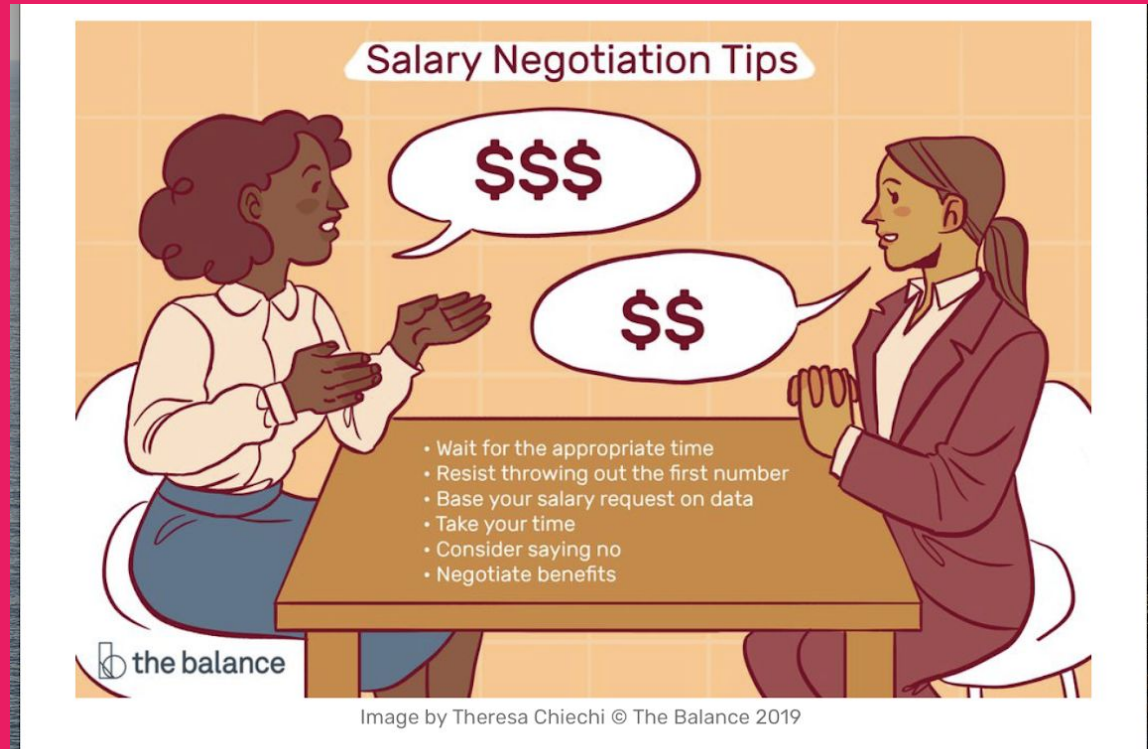


Capstone: Strategies for Women in Tech to Negotiate a Salary

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[Github](<https://git.generalassembly.com>)

☀ Problem Overview



Problem Statement

We at NB Recruiting help place women in rewarding tech positions. Our goal is build a regression model to help predict assesses various features like education, job types, and organization, to help a woman predict her likely salary in a new job. Also for them who want to switch their job. It's a good idea to research the job and the employer to be sure that the compensation package is negotiable. We will use root mean squared error (RMSE) as our regression metric to evaluate the success of our models.

Survey From:

- roberthalf.com

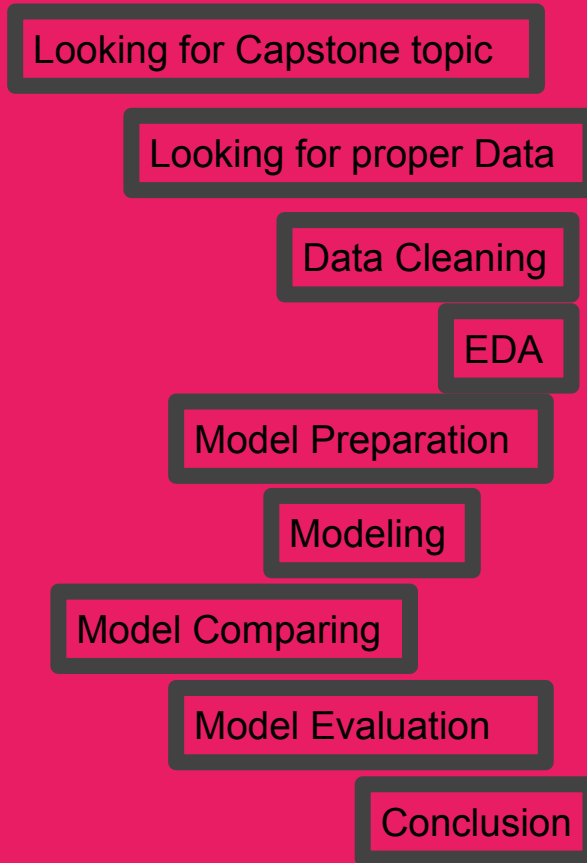
- more than 2700
workers employed
in the US
professional
environment

WHO TRIED TO NEGOTIATE SALARY?

Percentage of workers who tried to negotiate higher pay in their last job offer, by gender and age:

	TOTAL	GENDER		AGE		
		MALE	FEMALE	18-34	35-54	55+
Yes	39%	46%	34%	45%	40%	30%
No	61%	54%	66%	55%	60%	70%

Workflow



In this dataset :

- 6893 observations.
- Target Column is **SALARY**
- We Focusing on the United States women.
- Survey Based on 2017 to 2019
- Tech Jobs are:
 - Microsoft SQL Server
 - Oracle
 - Postgresql
 - MYSQL/MariaDB
 - Azure SQL DB
 - DB2 (Database Administration)
 - Microsoft Access
 - Amazon RDS (any flavor)
 - SAP
 - Teradata
 - MongoDB
 - SQLite
 - Elasticsearch
 - Cassandra
 - Other

Exploratory Data Analysis

Salary depending on Job title

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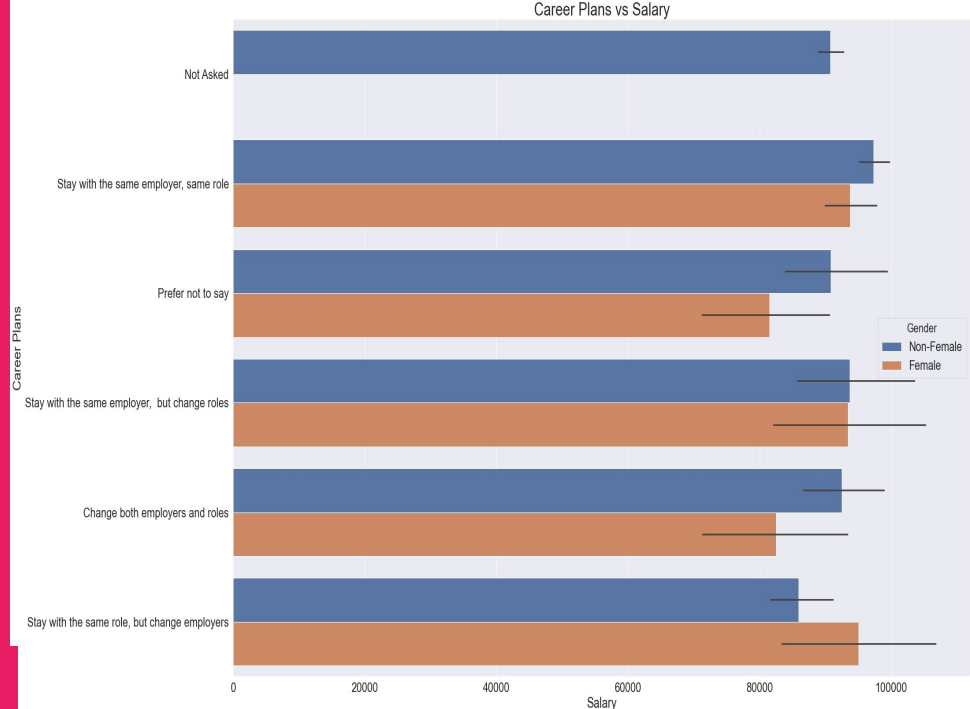
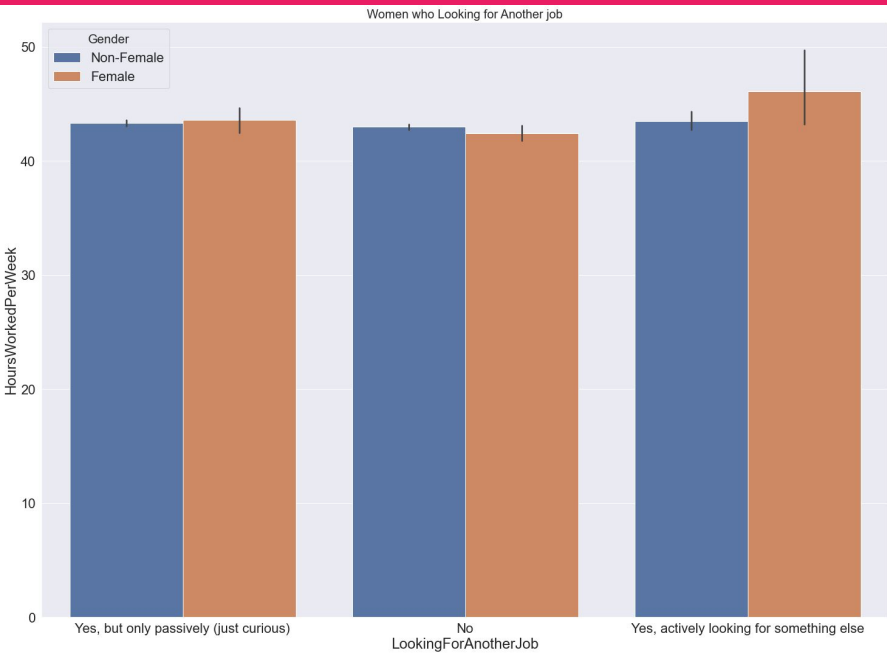
Gender

Non-Female

Female

From 2017 to 2019 still in many sectors women are less paid than men. But we can see a tremendous salary increase for women as a "Data Scientist" which is almost near to 150k. As an 'Engineer' they are getting near to 100k salary nowadays.

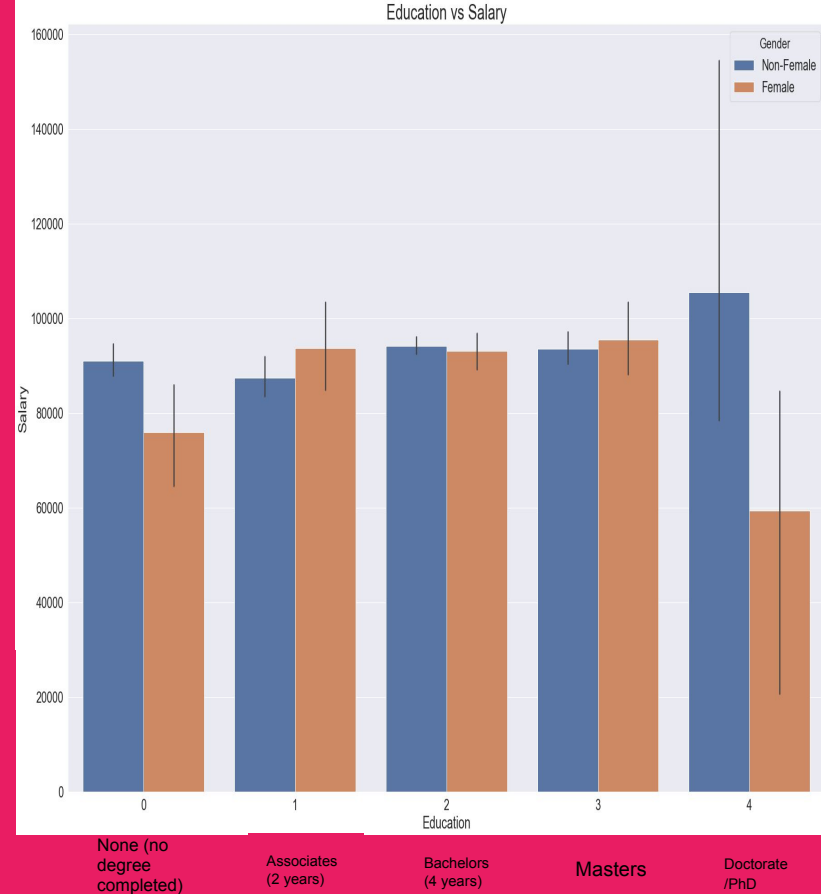
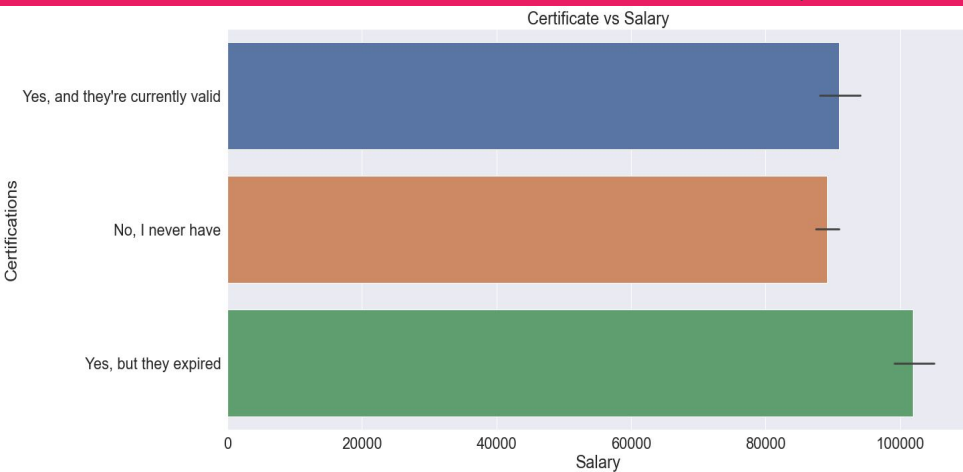
Women who want to switch jobs said 'change both employers and role' and 'Stay with the same role, but change employers' are having 80k to 90k salary but for some reason, they want to switch for a new job.



Here we can clearly see that, after 2017 women are getting interested to look for better job. May be Some of them are not satisfied with current job or current salary or hour. Who are actively looking for job they are working almost 45hrs/week.

In every sector of education, all gender people are having a job with a good salary. there is less participation in the Ph.D. level for women especially. Even without a degree it shows also having a job with a good salary in Tech field.

For everyone who can see if they Didn't have or have a valid certificate they can earn more than 80000, But who had expired certificate(people who are working for long or experienced) they are earning more than 100k.



Modeling

- **Baseline Model**
- **Linear Regression**
- **Lasso Regression**
- **Ridge Regression**
- **Decision Tree Regression**
- **Bagging Regressor**
- **Random Forest Regression**
- **AdaBoost Regressor Model**
- **Support Vector Regression.**
- **Gradient Boosting Regressor Model**

Compare all Models RMSE

Model's	Train Score RMSE	Test Score RMSE
Baseline Model	57965.30	57179.03
Linear Regression	50703.38	50119.97
Lasso Regression	51000.46	50185.85
Ridge Regression	50706.05	50109.96
Descision Tree Regression	50845.21	50946.79
Bagging Regressor	53372.20	52250.66
Random Forest Regression	42837.89	49201.32
AdaBoost Regressor Model	52109.22	51229.23
Support Vector Regression	51549.52	51028.98
Gradient Regressor Model	45255.78	49526.15

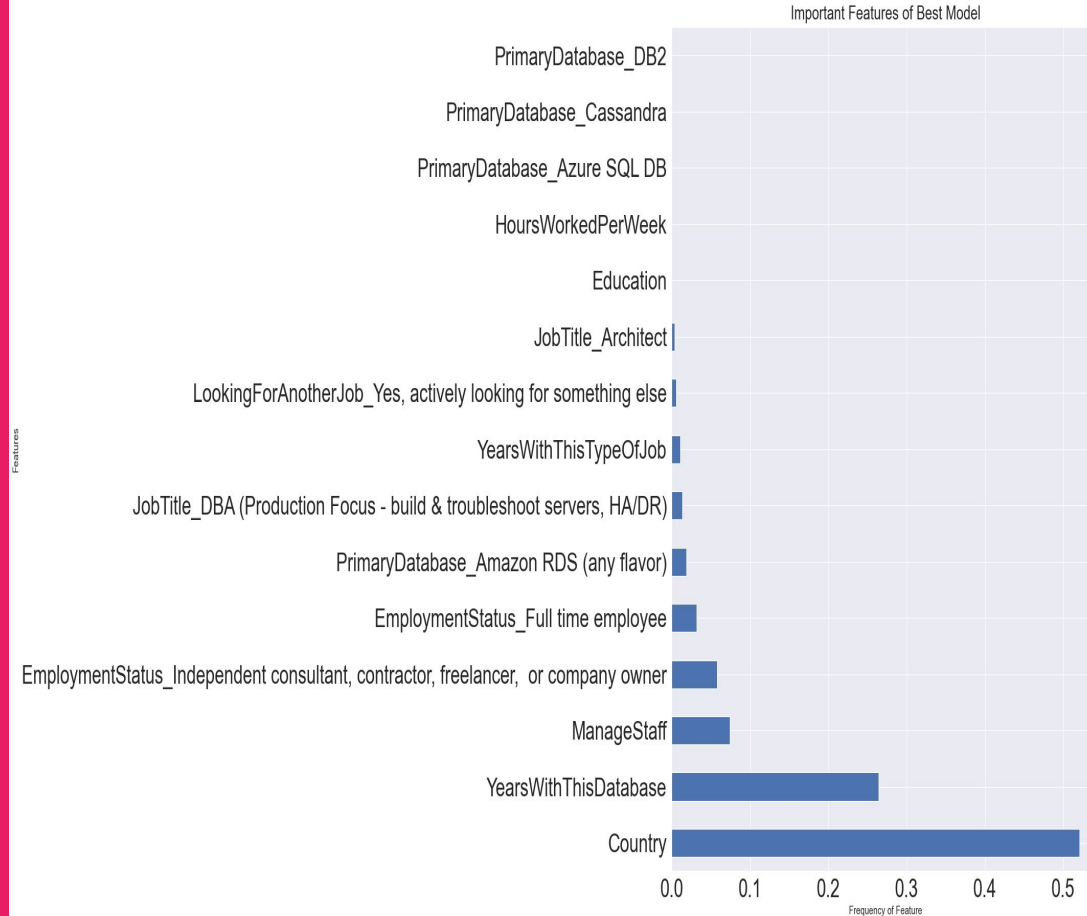


We Select

Decision Tree
Regression Model

Model Evaluation

Here **Country, YearsWithThisDatabase, ManageStaff, EmploymentStatus_Independent consultant, contractor, freelancer, or company owner, EmploymentStatus_Full time employee, PrimaryDatabase_Amazon RDS (any flavor), JobTitle_DBA(Production Focus - build & troubleshoot servers, HA/DR), YearWithThisTypeOfJob** are the most important features that are related to target column SalaryUSD. We can see the presence of some unexpected variables too. Most surprisingly Education has less importance in salary negotiation. From this model, women can get an idea about the feature they should know or study before negotiating their salary. even they will get to know that are they will offering fairly or not.



Conclusion & Recommendation

Our Decision Tree Regressor was able to give us the most successful RMSE scores and was selected as the best model to help solve our study problem. But If I get more time I will go over unexpected columns importance again to have a more proper prediction.

Some experts believe one should always negotiate salary and ask for more money. Before one do that though, it's a good idea to research the job and the employer to be sure that the compensation package is negotiable. There are some positions where the pay rate is set in advance. On the plus side, there won't be gender discrimination because everyone is paid the same. On the negative side, what you are offered is what you will be paid. Our model will help Women of the United State to know what should they research for, how much they can get hourly in which job or title of the job, how much their education is necessary to have a better salary.



References

[https://data.world/finance/data-professional-salary-survey/workspace/file?filename=2019 Data Professional Salary Survey Responses.xlsx](https://data.world/finance/data-professional-salary-survey/workspace/file?filename=2019%20Data%20Professional%20Salary%20Survey%20Responses.xlsx)

<https://www.roberthalf.com/blog/compensation-and-benefits/who-most-likely-negotiated-salary>