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Intro to Data Analysis

SDT 100 01

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**Analyzing Tech Compensation Trends from the 2025 Stack Overflow Survey**

**Project Question:** Which industries pay tech workers the most, and what explains these differences?

## Executive Summary

Our analysis examines the annual payment for technology professionals using data from the 2025 Stack Overflow Developer Survey, centered on US-based developers with 5 to 10 years of professional experience ( $N = 635$ ). We found large salary differences across these industries. The data reveals a clear pay hierarchy, with **Fintech (Financial Tech)** leading with the highest median salary of **\$135,000**. **Software Development** follows with a median salary of **\$125,000**. **Manufacturing** reveals the lowest median pay at **\$92,000**. A one-way ANOVA test we conducted confirmed these differences: ( $F=6.84$ ,  $p<.001$ ). Our results suggest that specific factors, such as the demand for secure systems in regulated or profitable sectors, are key drivers of compensation. This data reveals the critical role of industry selection in a tech worker's career planning and desired compensation.

## Introduction

The tech labor market is one of the most versatile and well compensated. As companies across sectors compete for a small pool of positions, understanding the reasons for high compensation is crucial. Variables like experience, skills, and education are common, but the impact of the industry in which a tech employee works is less known. Our project addresses this dilemma by focusing on our research question: "**Which industries pay tech workers the most, and what explains these differences?**" Our project explores two focuses: companies need to know if their employee compensation is competitive not just against other tech firms, but against firms in finance, healthcare, and other departments. For upcoming employees, understanding the industry premium, otherwise known as penalty, is crucial for career planning and maximizing salary compensation.

## Data and Methods

The data source we utilized was the Stack Overflow Annual Developer Survey 2025, a global survey of tech professionals. To create a cleaned and wrangled dataset, we performed the following data cleaning steps using Python:

- Filtered for Country: Kept only respondents from the United States of America.
- Filtered for Employment:
- Kept only respondents with Employment=Employed.
- Cleaned Salaries: Removed rows with blank ConvertedCompYearly.
- Removed Outliers: Kept only salaries between \$30,000 and \$500,000.
- Filtered Experience: Kept only respondents with YearsCodePro between 1 and 30.

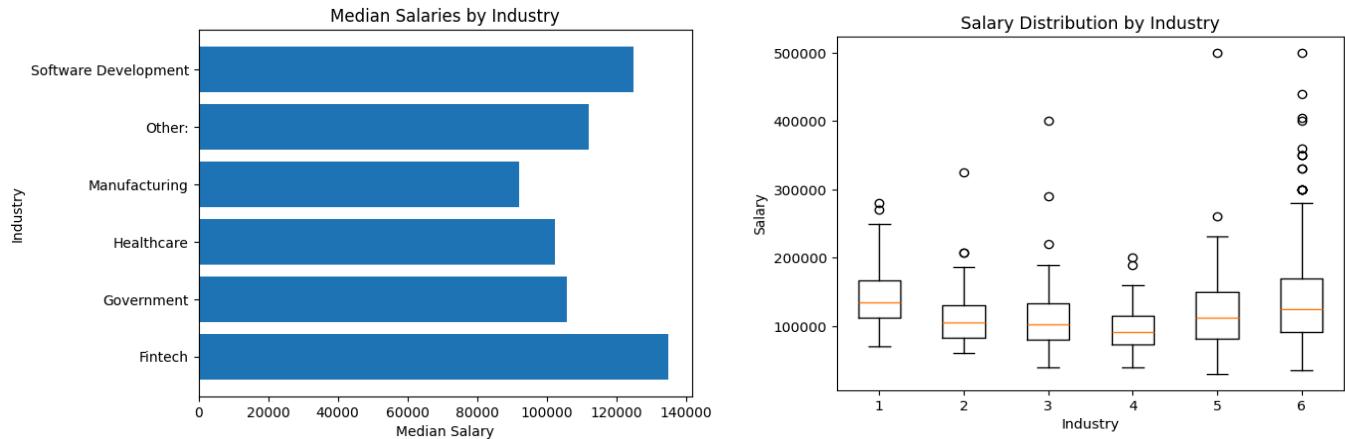
After cleaning the data, we took some extra steps to set up the data to give us information about the information we were looking into. We started by finding the top 6 industries by amount of people in the industry and then taking the median salary from each of them. To ensure there was a controlled environment we also filtered the data to only show workers with 5-10 years of experience. This gave us the best ability to determine what industry was making the most money the most consistently and eliminated the chance for lots of outliers.

## Analysis Sample and Method

We filtered our dataset to include only developers with 5 to 10 years of professional experience. We identified the top 6 industries to ensure sufficient group sizes for comparison. Our final analysis sample consisted of N=635 developers. We examined Descriptive Statistics, where we calculated the median and mean salaries for each of the top industries. Then we established a horizontal bar chart (Figure 1) to rank industries by median salary and then created

a box plot (Figure 2) to show distributions. We then created a one-way ANOVA test to show whether the differences in mean salaries across industries were considerable.

## Visualizations



**Figure 1:** a horizontal bar chart that ranks industries by median pay. This helps to illustrate the deviation in salary for different industries based on the median for each to allow for a simple picture to be drawn.

**Figure 2:** box plots that show salary distributions, the median and the variance of pay. This helps us demonstrate not only the variance of each industry but it also shows us some of the outliers in each as well as how many people are making very high salaries. This gives the reader a better understanding of the upside or downside of certain industries when it comes to compensation.

## Results & Discussion

Our analysis showed clear differences in salary based on industry. The median salary (50%) category was the primary data value for ranking to minimize the effect of outliers.

**Table 1: Descriptive Statistics for Annual Salary (USD) by Industry (5-10 Yrs Exp).** The descriptive statistics help to back up the information from our explanations as well as our visuals from the last part. It gives us a wider view at different statistics and how the compensation can change for each industry based on the demand at certain times for each.

Industry	count	mean	std	min	25%	50%	75%	max
Fintech	43	145768.44	50684.55	70000	112000	135000	167500	280000
Government	59	114397.88	45625.40	60000	82500	105966	131000	325000
Healthcare	66	115797.95	56672.56	40000	80000	102500	133250	400000
Manufacturing	52	96006.19	35322.22	40000	73641.5	92000	115000	200000
Other:	93	121486.82	59407.51	30000	82000	112000	150000	500000
Software Development	322	139216.26	70466.5735	35000	91075	125000	170000	500000

## Inferential Statistics

To ensure our results were not just coincidental, we conducted a one-way ANOVA test which compared the mean salaries of the 6 industry groups. The results were significant:  $F=6.84$ ,  $p<.001$ . The p-value indicates that there is less than a 0.1% probability that these differences in salary are due to any random sampling error. We can conclude industry is a very significant element of determining a specific employee's salary.

## Discussion of Differences

The salaries in the high paying sectors of FinTech and Software are heavily regulated and demanding efficient software. The cost of failure is extremely high. This environment influences IT spending and salaries in the financial sector. Developers often manage complex systems with modern platforms, requiring a specialized and qualified talent pool. The manufacturing and healthcare industries pay well and sit in the upper middle of the salary distribution. It is vital to note that our ConvertedCompYearly variable will not fully capture company equity, stock shares held, or other bonuses. In the Government and Non-profit subsects, we see the bottom of the pay scale. Their compensation is often limited by public or donative budgets. Government and Non-Profit development recruiters must attract talent using non-monetary rewards like job security, public service, or belief in a mission.

## **Limitations**

Our study has several limitations and can only be taken seriously in the regards of general approximation. The data is self-reported, which can lead to inaccuracies. The ConvertedCompYearly variable does not represent total compensation. The Industry categories are broad as tech itself contains many sub-industries. We did not control other key variables like job role, location, or specific skills.

## **Conclusion**

Our project successfully answered our research question by leveraging the Stack Overflow 2025 survey data. We confirmed that industry is a clear predictor of tech worker compensation, even after controlling for years of experience. We identified a clear pay hierarchy, with Fintech leading.

## **Managerial Recommendations & Implications**

For Career Planning: Developers should actively consider industry as a key factor in their career path. A mid-career developer in a low-paying industry could potentially increase their salary by over 30% by transitioning to a role in Finance. Businesses must realize their compensation strategies not just against their competitors, but against all industries competing for tech developers. For Recruitment by Lower Paying Industries: Companies in sectors like Non-profit and Government cannot win in the salary field. Their recruitment and employee retention strategies must strongly highlight non-fiscal benefits, such as job stability, work-life balance, remote work flexibility.

## Works Cited

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