

# **PREDICTING DEVELOPER SALARIES USING STACK OVERFLOW SURVEY DATA**

**GROUP: G5**

# GROUP 6

# MEMBERS

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## THE PROBLEM

Can we predict annual developer salaries using demographic, professional, and technical features?

## WHY IT MATTERS

Provide fair, data-driven salary benchmarks for developers and employers.

Transparent salaries empower job seekers and help companies stay competitive

**01**

**DEVELOPERS**

Benchmark salaries to  
negotiate better pay.

**02**

**EMPLOYERS**

Set competitive, fair salaries  
to attract talent.

**BUSINESS CONTEXT**

**03**

**HR PLATFORMS**

Integrate salary predictions  
into job boards.

**04**

**BIG PICTURE**

Inform career paths and  
labour market policies.

# OUR DATA: STACK OVERFLOW SURVEYS



## SOURCE

Stack Overflow  
Developer  
Surveys (2023 &  
2024)



## SIZE

Over 100,000  
responses from  
188 countries  
including Kenya



## KEY FEATURES

Demographic (e.g  
country) Professional  
(e.g experience)  
Technical ( e.g  
programming lang)



## TARGET

Annual salary in  
USD (log-  
transformed for  
accuracy)

# HOW WE BUILT THE MODEL

Cleaned and combined 2023–2024 survey data, handling missing values and schema differences.

## DATA PREP

Created features like number of languages and experience level.

Tested multiple models (Linear Regression, Random Forest, XGBoost, LightGBM).

## FEATURE ENGINEERING

## MODELLING

Optimized model settings for better accuracy

## TUNING

Measured accuracy and explained key salary drivers.

## EVALUATION



## RESULTS

### BEST MODEL

**LightGBM (fast and accurate)**

**Accuracy:** Predictions within 50% of actual salary.

Explains 62% of salary differences.

### KEY DRIVERS

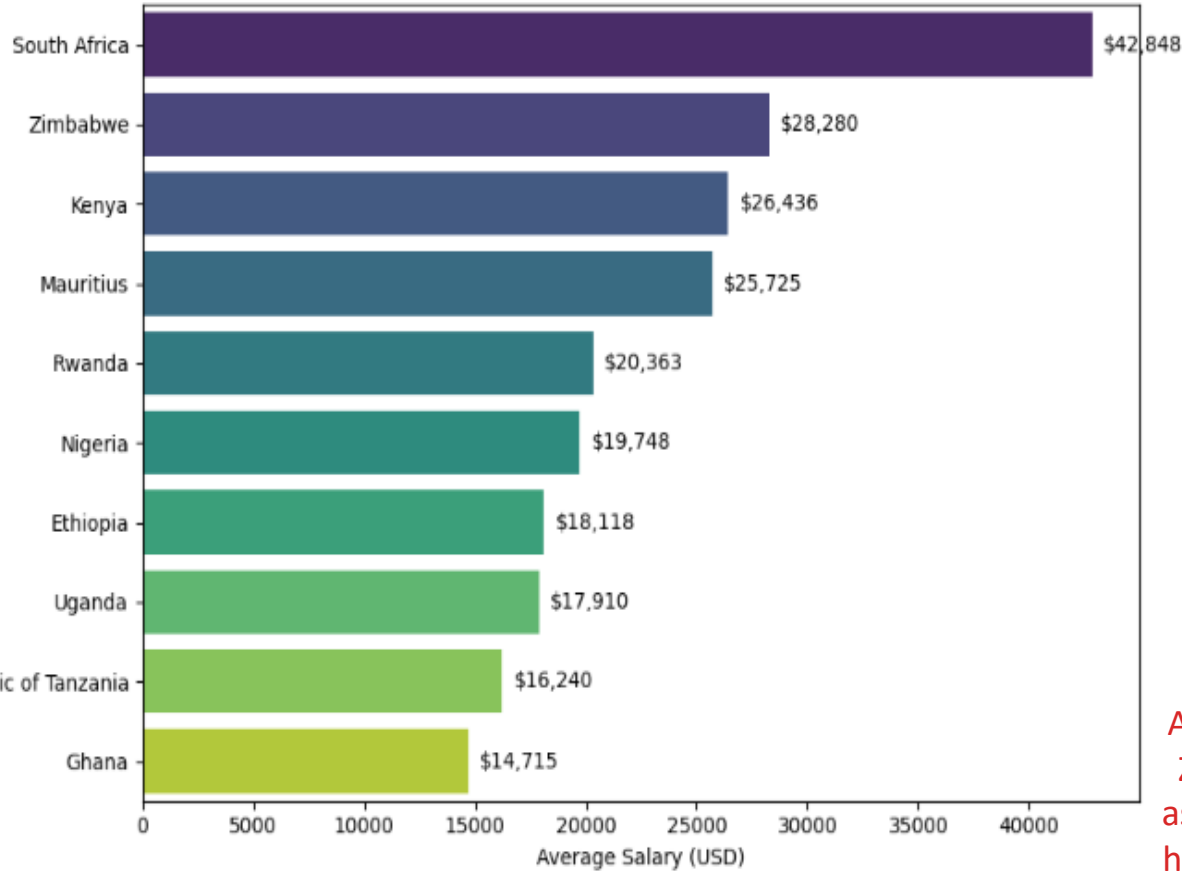
Years of experience

Number of programming languages

Education level

Geographic region

□ Average Developer Salary by SSA Country (Top 10)



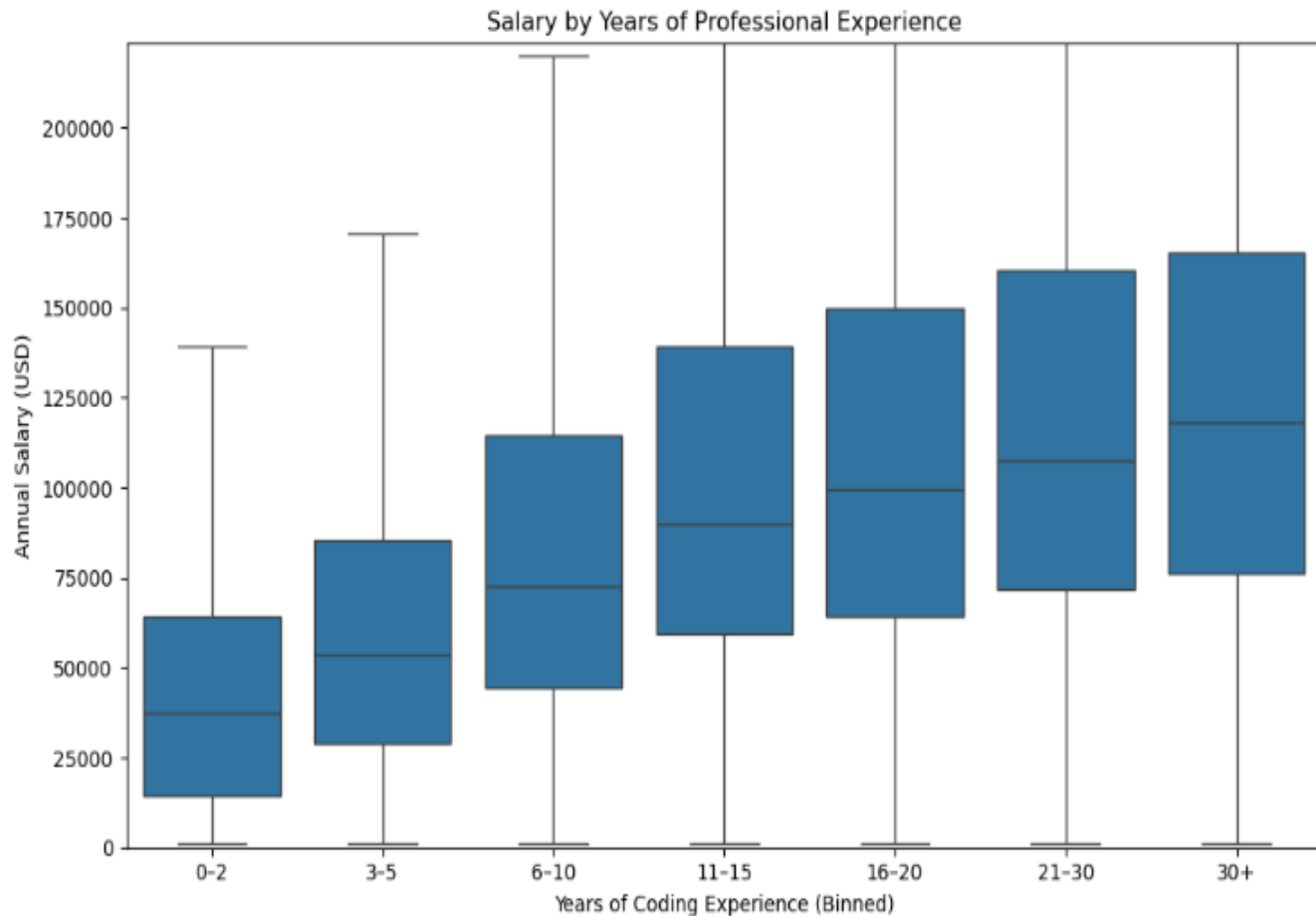
# AVERAGE DEVELOPER SALARY

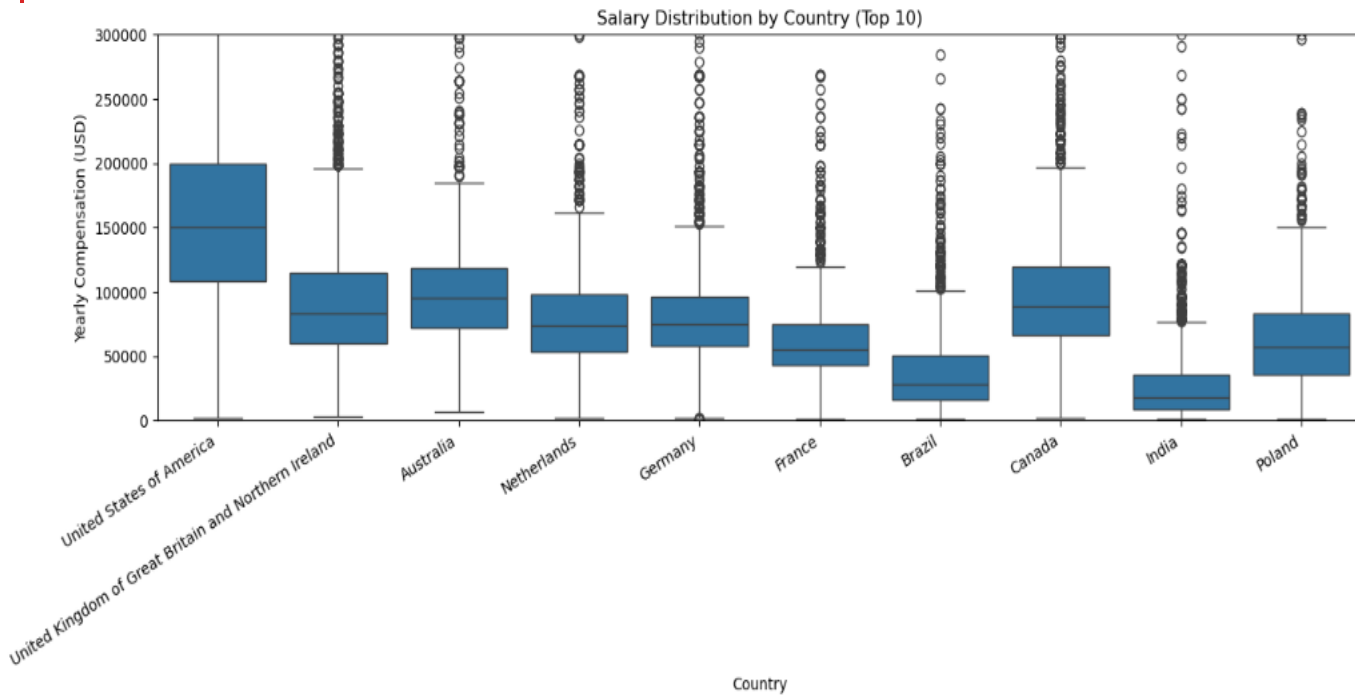
As per this analysis, South Africa, Zimbabwe, and Kenya emerged as the countries in Africa with the highest average developer salary.



# SALARY BY YEARS OF EXPERIENCE

As expected, more  
experience demanded a  
higher increase in salary





# SALARY DISTRIBUTION BY COUNTRY

Significant differences are illustrated in the salary ranges. Some countries, such as the United States and Canada, have a significantly wider salary distribution, while others, like Poland and India, have a more compressed range.



# SALARY PER DEVELOPER ROLE

The roles with the highest salary ranges are Engineering Manager, Data Scientist/Machine Learning Specialist, and DevOps Specialist. These roles appear to offer the highest annual compensation, with salaries potentially reaching \$175,000 or more.



## 1. EVALUATION

- Accuracy (RMSE): 0.46 (close to target of 0.35–0.45).
- R2 Score: 0.62 (explains 62% of salary variation).
- Validated using 20% holdout set and 5-fold cross-validation.



## 2. FUTURE IMPROVEMENTS

- Add cost-of-living data for better accuracy.
  - Explore neural networks for complex patterns.
  - Enhance Kenya-specific data with regional sources.
- Test additional ensemble methods.

# EVALUATION & FUTURE IMPROVEMENTS



# CONTACT US



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**Team: G5**

**Git repo**

Reach out if you have any  
questions