

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, Neural
Networks).

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

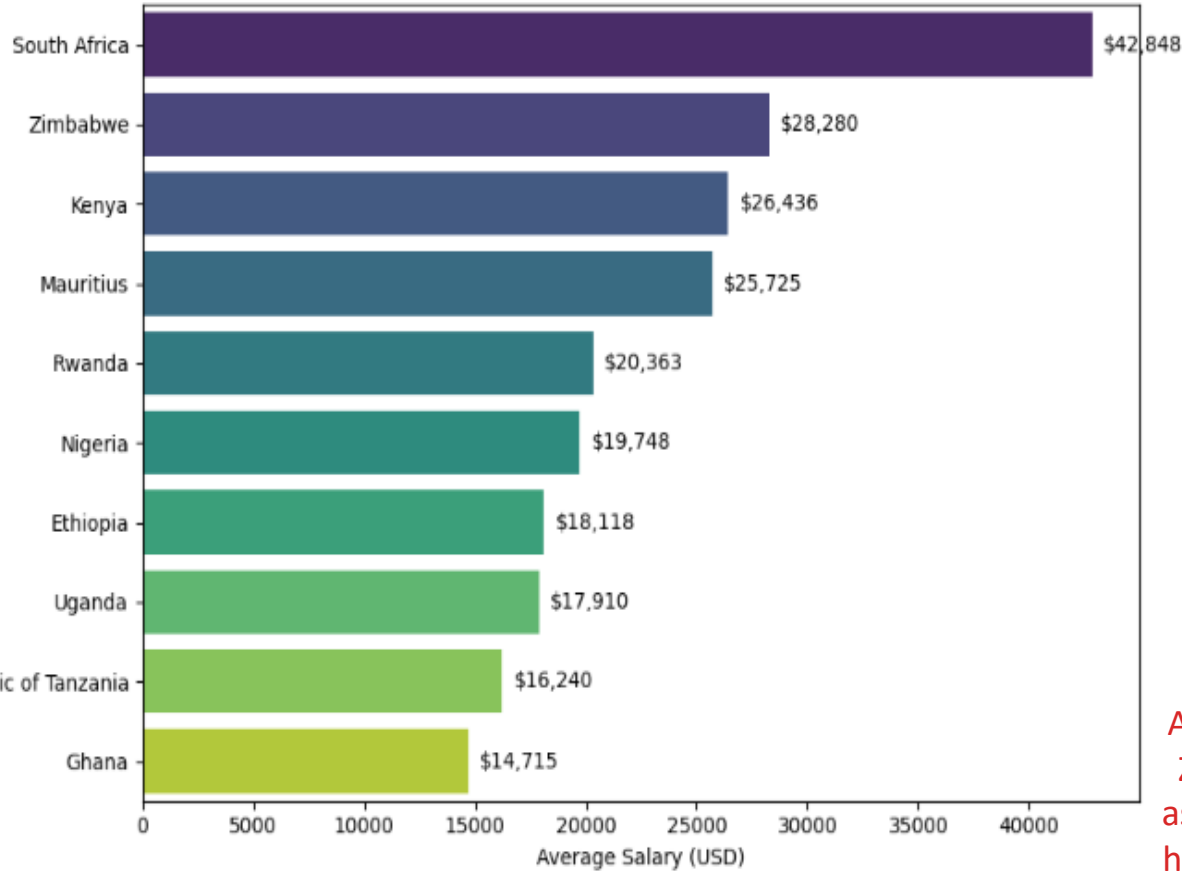
Years of experience

Number of programming languages

Education level

Geographic region

□ Average Developer Salary by SSA Country (Top 10)

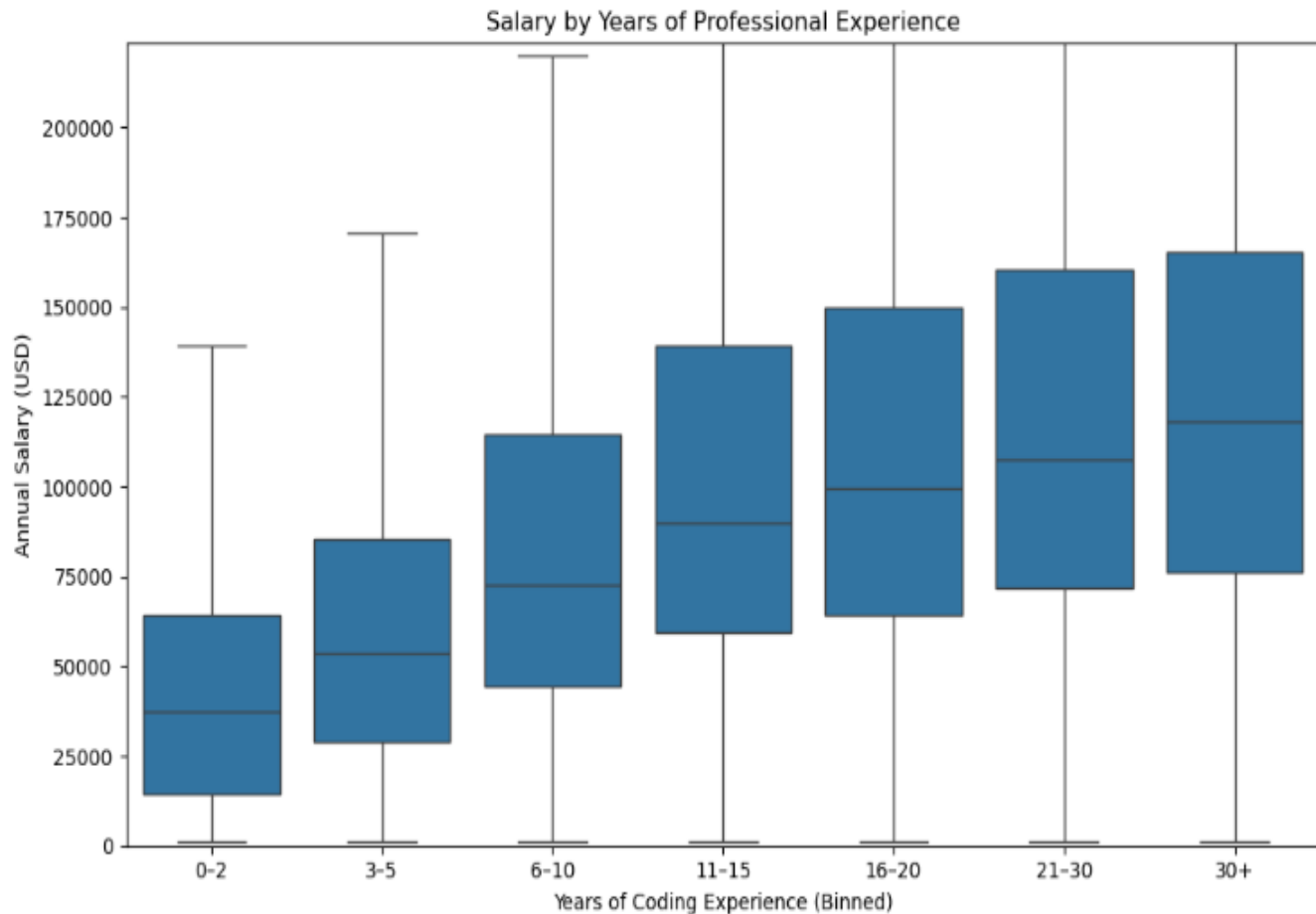


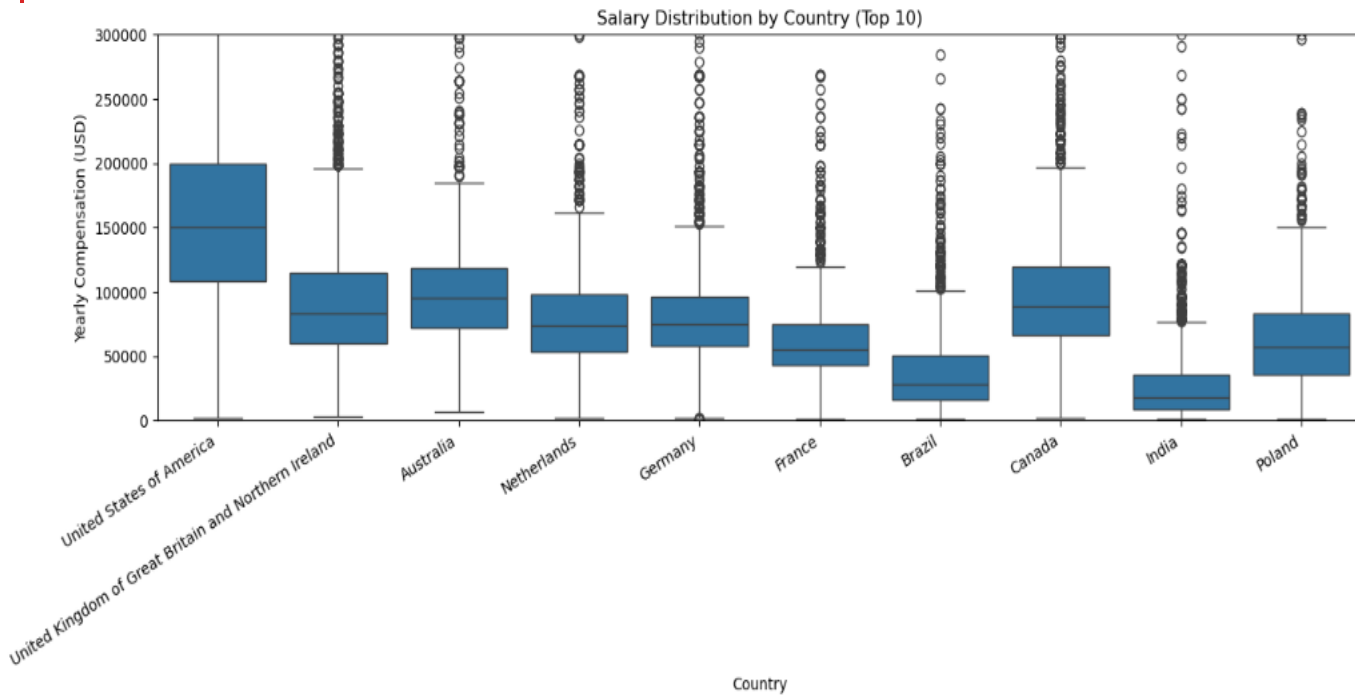
AVERAGE DEVELOPER SALARY

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 further with 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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Git repo

Reach out if you have any
questions