



# Bangalore Institute of Technology

K.R Road, V.V Pura, Bengaluru-560004

Department of Computer Science &



## “**DevPay.pro** : Anticipating Software Developer Earning in India”

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**Department of CSE, BIT**





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## Agenda

- Introduction
- Existing Systems
- Problem Statement
- Objectives
- Tools and Technologies
- Architectural Diagram
- Modules Description
- Implementation
- Results
- Applications
- Conclusion and Future scope





## INTRODUCTION

- ❑ **DevPay Pro:** A transformative solution for the Indian software development community.
- ❑ **Key Features:**
  - ❖ Unprecedented insights into software developer earnings.
  - ❖ Intuitive interface with robust backend architecture.
  - ❖ Personalized salary projections.
  - ❖ Scalability and affordability.





## EXISTING SYSTEMS

- **Challenges with existing systems:**
  - 1) Fragmented data sources.
  - 2) Inaccurate projections.
  - 3) High subscription costs.
  - 4) Using in-efficient models for prediction.
- **Need for a Comprehensive Solution:** Addressing these issues with DevPay Pro.





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## PROBLEM STATEMENT

In the rapidly evolving tech industry, understanding and predicting developer salaries is crucial for both employers and employees. Traditional salary surveys often fail to capture the dynamic nature of the market, leading to outdated or generalized insights. DevPay.Pro aims to address this gap by providing a robust, data-driven platform to predict developer salaries based on various attributes such as years of coding experience, educational background, programming languages known, and geographical location.





## OBJECTIVES

Develop a predictive model that accurately forecasts developer salaries using machine learning techniques. The model should incorporate multiple features, including but not limited to:

- Years of coding experience
- Educational degree
- Programming languages known
- Country/Region
- Industry sector





## TOOLS AND TECHNOLOGIES

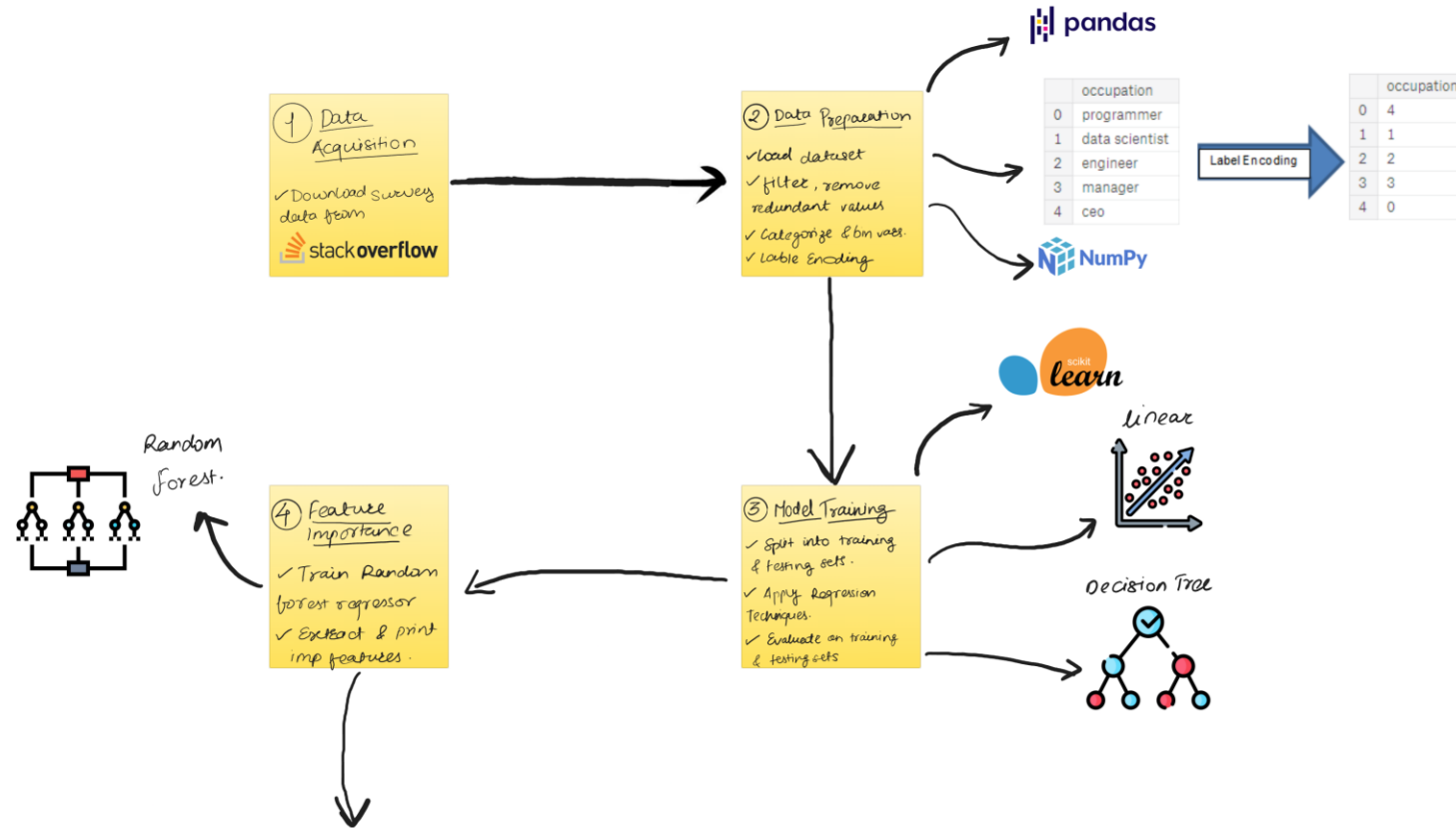
- **Frontend:**
  - ❑ StreamLit
  - ❑ HTML/CSS
- **Backend:**
  - ❑ Python - StreamLit
- **Data Analytics:**
  - ❑ Sci-kit Learn
  - ❑ Numpy
  - ❑ Pandas
  - ❑ Matplotlib
  - ❑ Machine Learning Algorithms







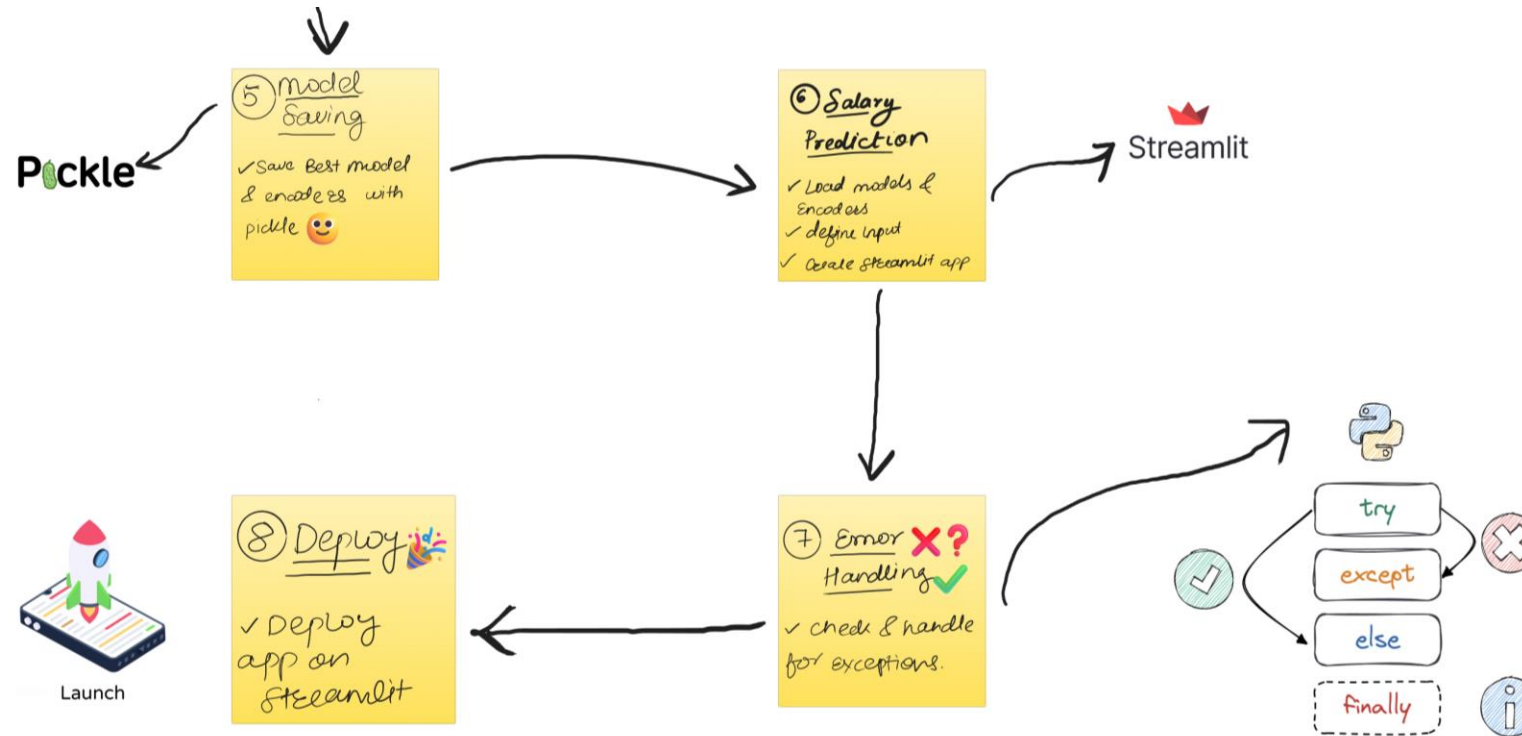
## ARCHITECTURAL DIAGRAM







## ARCHITECTURAL DIAGRAM





## **MODULES DESCRIPTION**

- **Data Input and Validation:**
- Interface for users to input their details such as years of experience, education level, programming languages known, etc. Includes validation to ensure data accuracy.
- **Data Preprocessing:**
- Backend module to preprocess user-inputted data, handling missing values, encoding categorical variables, and scaling numerical features.





## MODULES DESCRIPTION

- **Machine Learning Model Training:**
- Module for training machine learning models using historical salary data and the user-provided features. Includes selecting the appropriate model (e.g., regression, ensemble methods) and optimizing hyperparameters.
- **Prediction Engine:**
- Component that generates salary predictions based on the trained models and user inputs. Provides explanations or insights into how each feature affects the predicted salary.





## MODULES DESCRIPTION

- **Visualization and Reporting:**
- Module to create interactive visualizations (e.g., salary distribution charts, trend graphs) that help users explore and understand salary insights based on different criteria (e.g., location, job role).
- **User Interface (UI) Design:**
- Development of a user-friendly interface using frameworks like Streamlit or Flask to facilitate easy navigation and interaction with the application.
- **Deployment and Hosting:**
- Implementation of the application on a web server, ensuring scalability and reliability. Integration with cloud services (e.g., AWS, Azure) for efficient hosting and management.





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## MODULES DESCRIPTION

- **Documentation and Help Section:**
- Creation of comprehensive documentation explaining how to use the application, interpret results, and troubleshoot common issues. Includes a help section or FAQs

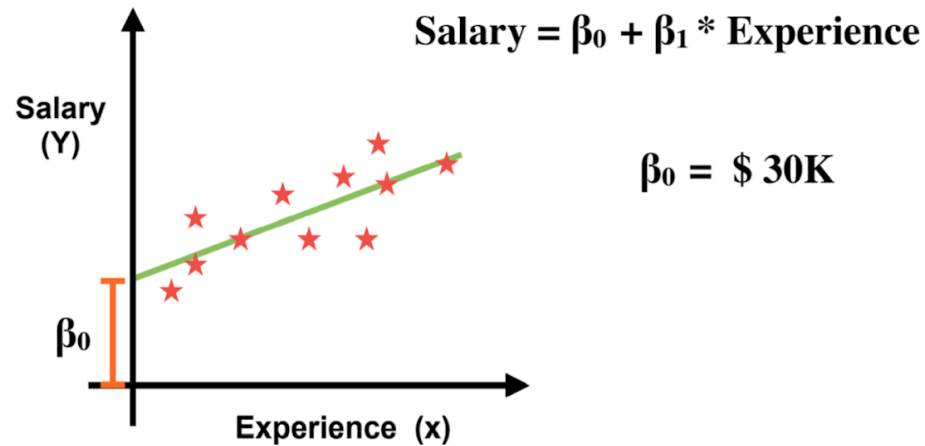




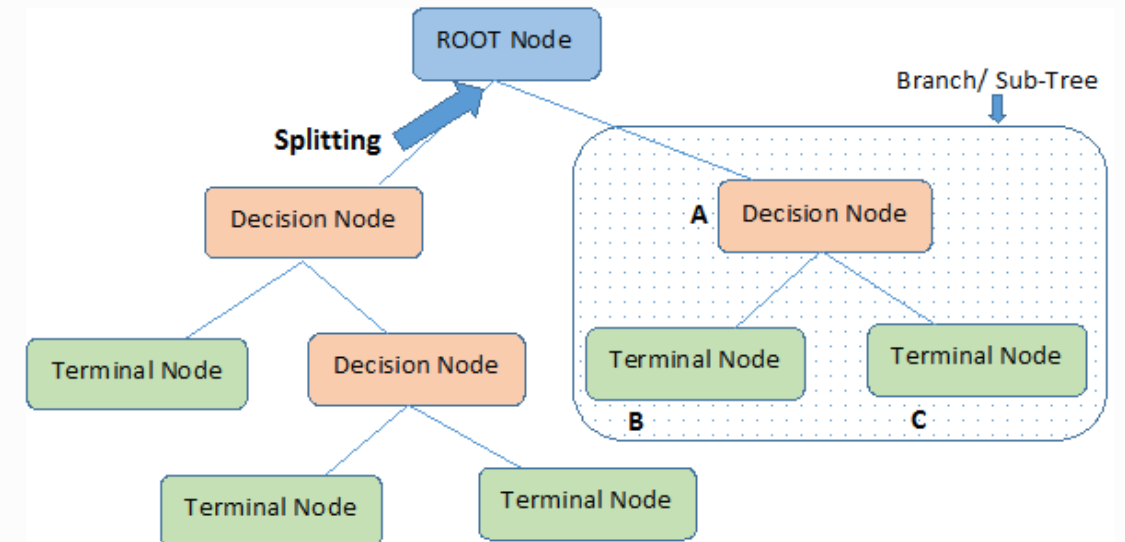
## IMPLEMENTATION

Algorithms (or) Code Snippet (or) Pseudocode

### Linear Regression



### Decision Tree

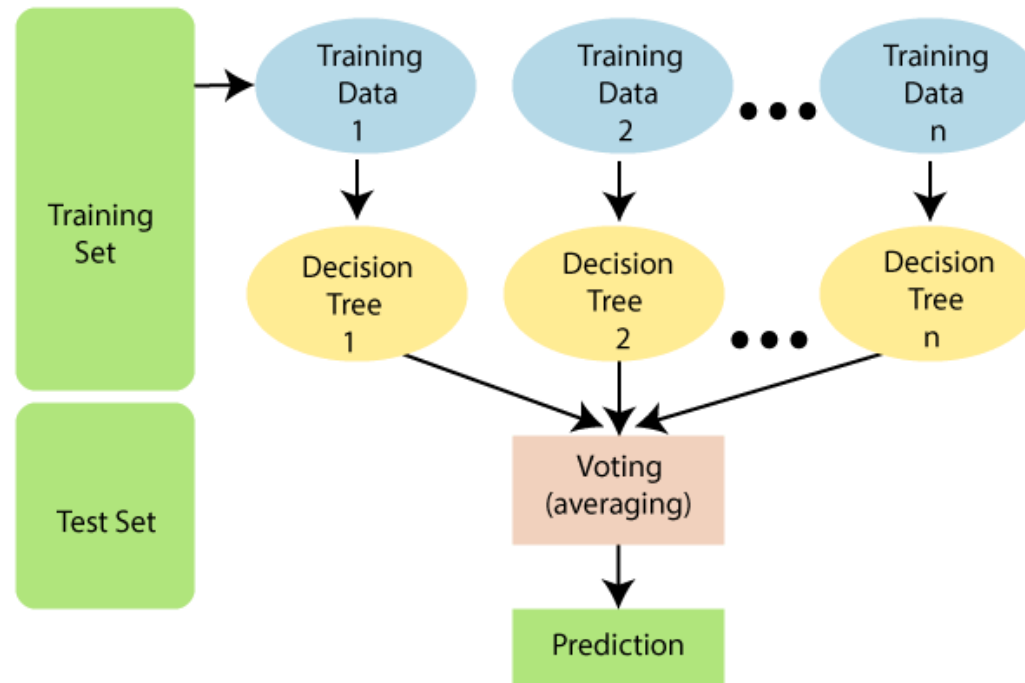






## IMPLEMENTATION

Algorithms (or) Code Snippet (or) Pseudocode



**Random Forest  
Algorithm**





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## IMPLEMENTATION

Algorithms (or) Code Snippet (or) Pseudocode

```
Developer's Salary Prediction.ipynb  app.py 3 x requirements.txt home_page.py social_page
app.py > ...
1 import streamlit as st
2 import streamlit_option_menu
3 from streamlit_option_menu import option_menu
4 from predict_page import show_predict_page
5 from explore_page import show_explore_page
6 from home_page import show_home_page
7 from social_page import show_socials_page
8 logo_path = "menulogo.png"
9
10 with st.sidebar:
11     st.image(logo_path, use_column_width=True)
12     st.title("Main Menu")
13     selected2 = option_menu(None, ["Home", "Predict", "Explore", 'Socials'],
14         icons=['house', 'cloud-upload', "search", 'gear'],
15         menu_icon="cast", default_index=1, orientation="vertical")
16
17 if selected2 == "Predict":
18     show_predict_page()
19 elif selected2=="Explore":
20     show_explore_page()
21 elif selected2=="Home":
22     show_home_page()
23 elif selected2=="Socials":
24     show_socials_page()
25
26
```

```
Developer's Salary Prediction.ipynb  app.py 3 requirements.txt home_page.py 2 social_page
explore_page.py > show_explore_page
1 import streamlit as st
2 import pandas as pd
3 import matplotlib.pyplot as plt
4
5 # Create a function to compile the countries with smaller values into "Others" category
6 def compile_countries(categories, cutoff):
7     categorical_map = {}
8     for i in range(len(categories)):
9         if categories.values[i] >= cutoff:
10             categorical_map[categories.index[i]] = categories.index[i]
11         else:
12             categorical_map[categories.index[i]] = "Others"
13     return categorical_map
14
15 # Create a function to standardize and clean the coding experience column
16 # Convert Coding Experience Column into float data type
17 def clean_yearsCodePro(x):
18     if x == 'More than 50 years':
19         return 50
20     if x == 'Less than 1 year':
21         return 0.5
22     return float(x)
23
24 # Clean education column into a few categories
25 def clean_edLevel(x):
26     if "Bachelor's degree" in x:
27         return "Bachelor's degree"
28     if "Master's degree" in x:
29         return "Master's degree"
30     if "Professional degree" in x or "Other doctoral" in x:
31         return "Postgraduate"
32     return "Less than a Bachelors"
33
```





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## IMPLEMENTATION

### Algorithms (or) Code Snippet (or) Pseudocode

```
Developer's Salary Prediction.ipynb  app.py 3  requirements.txt  home_page.py 2  social_pa

predict_page.py > load_model
1 import streamlit as st
2 import pickle
3 import numpy as np
4
5
6 @st.cache_data
7 def load_model():
8     with open('saved_steps.pkl', 'rb') as file:
9         data = pickle.load(file)
10    return data
11
12 data = load_model()
13
14 regressor = data['model']
15 le_country = data['le_country']
16 le_edLevel = data['le_edLevel']
17 le_remoteWork = data['le_remoteWork']
18
19 def show_predict_page():
20     st.title("Developers Salary Prediction")
21
22     st.write("""#### Please provide some information to us in order to predict the sal
23
24     countries = ("United States of America",
25                 "Germany",
26                 "United Kingdom of Great Britain and Northern Ireland",
27                 "India",
28                 "Canada",
29                 "Brazil",
30                 "France",
31                 "Spain",
32                 "Netherlands",
33                 "Italy",
```

```
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explore_page.py > show_explore_page
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```





## **APPLICATIONS**

### **Salary Negotiation Tool for Developers:**

- Developers can use DevPay.Pro to understand their market value based on their skills, experience, and location. This empowers them to negotiate better salaries and benefits with current or prospective employers.

### **Recruitment and Hiring Insights for Employers:**

- Employers and HR professionals can utilize DevPay.Pro to establish competitive and fair salary offers for potential hires. This helps attract top talent and ensures compensation packages are aligned with industry standards.





## APPLICATIONS

### **Career Planning and Development:**

- Developers can plan their career paths more effectively by exploring how different factors (e.g., learning new programming languages, gaining additional certifications) impact salary potential.

### **Market Analysis for Industry Professionals:**

- Industry analysts and researchers can leverage DevPay.Pro to analyze salary trends and patterns across different regions, job roles, and skill sets. This information can be used to publish reports and provide strategic insights.

### **Freelancer Rate Setting:**

- Freelancers and independent contractors can use the platform to set competitive hourly rates based on their expertise and the current market demand for their skills.





## CONCLUSION AND FUTURE WORK

### ❑ **Current Impact:**

- DevPay Pro empowers developers with essential salary insights.

### ❑ **Future Enhancements:**

- Expanding data sources and analytics capabilities.
- Incorporating more personalized career planning tools.

- ### ❑ **Long-Term Vision:** Continuous improvement to support the evolving needs of the tech industry.

