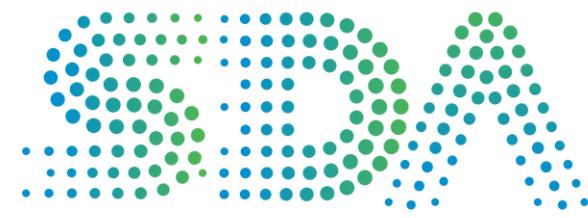


# Churn Prediction Project

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By: G-1 Team

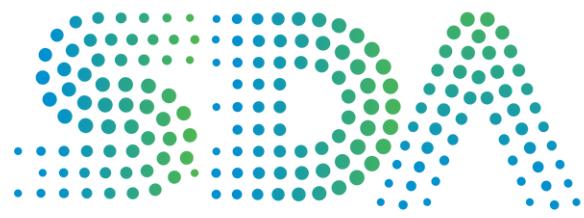




## G-1 Team Members

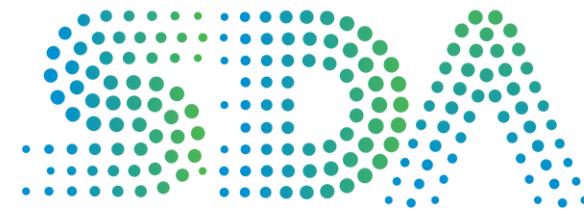
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- Ammar Alhawashem
  - Maram Alzahrani
  - Noof Alsafi
  - Taif Alzahr
  - Sara
  - Noura Alajmi
  - Hibah Sindi
  - Shahad Ali
  - Reema Almeshal
  - Raya
- 



# Outlines:

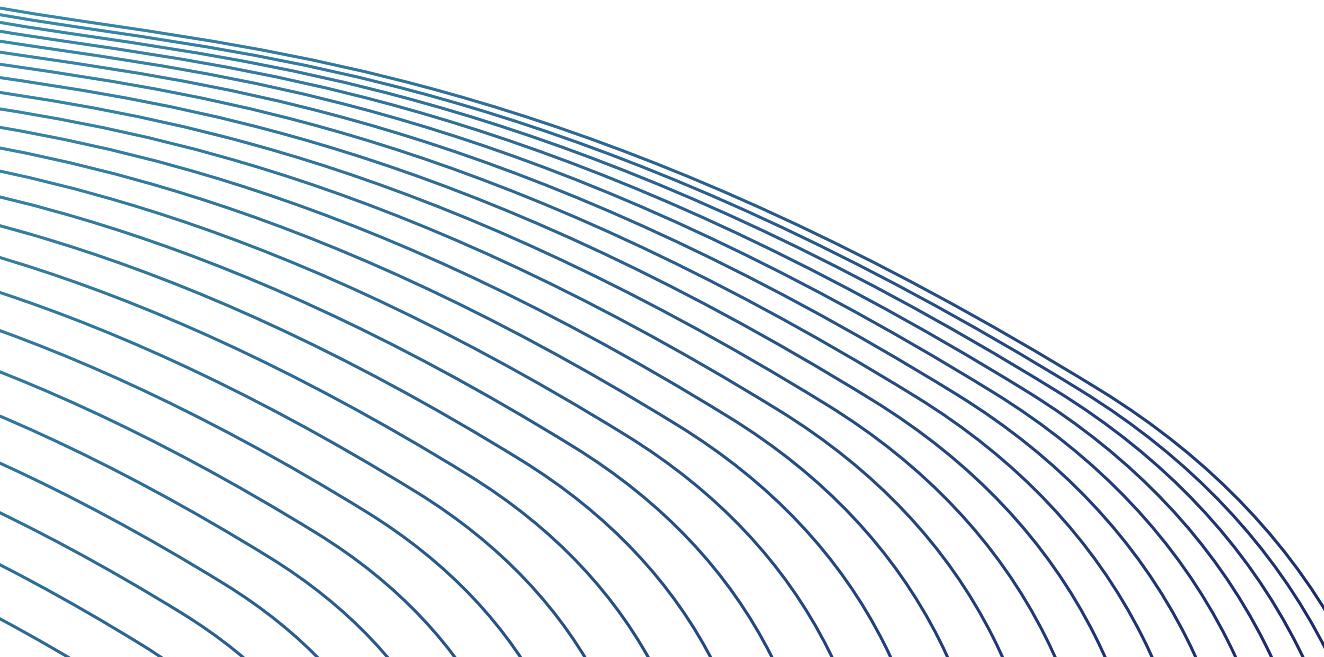
- Project Overview
- Data Analysis and Visualization
- Clustering
- Predictive Model
  - SVM model
  - RF model
  - XG Boost model
  - Multi Layer perceptrons
- Model Deployment
- Conclusion

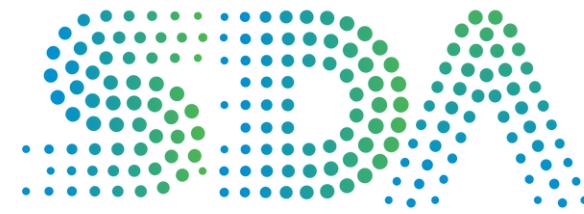


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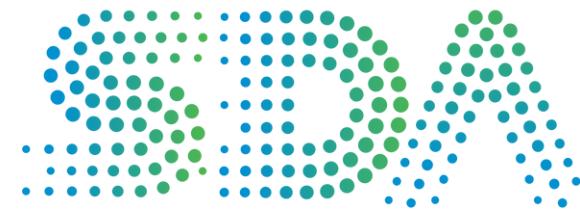
# Project Overview





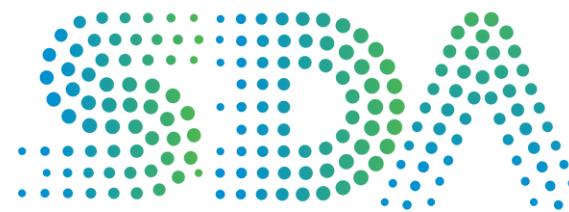
# Problem Statement

The project involves predicting employee churn using HR data, conducting exploratory data analysis, preprocessing, clustering analysis and employing classification algorithms, and deploying the best model via Streamlit



# Goal

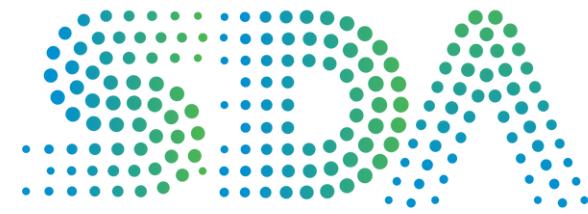
**Develop a robust predictive model leveraging HR data to accurately forecast employee churn, enabling companies to proactively address retention strategies and reduce attrition rates**



# Dataset

The dataset comprises various HR-related attributes for company employees, including satisfaction levels, performance evaluations, project assignments, monthly working hours, and tenure

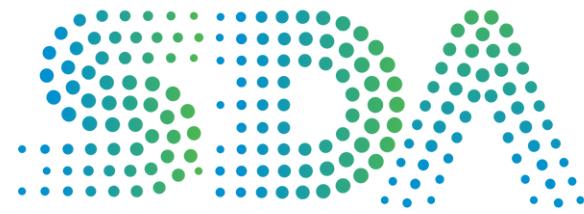
satisfaction_level	last_evaluation	number_project	average_montly_hours	time_spend_company	Work_accident	left	promotion_last_5years	Departments	salary
0.38	0.53	2	157	3	0	1	0	sales	low
0.80	0.86	5	262	6	0	1	0	sales	medium
0.11	0.88	7	272	4	0	1	0	sales	medium
0.72	0.87	5	223	5	0	1	0	sales	low
0.37	0.52	2	159	3	0	1	0	sales	low



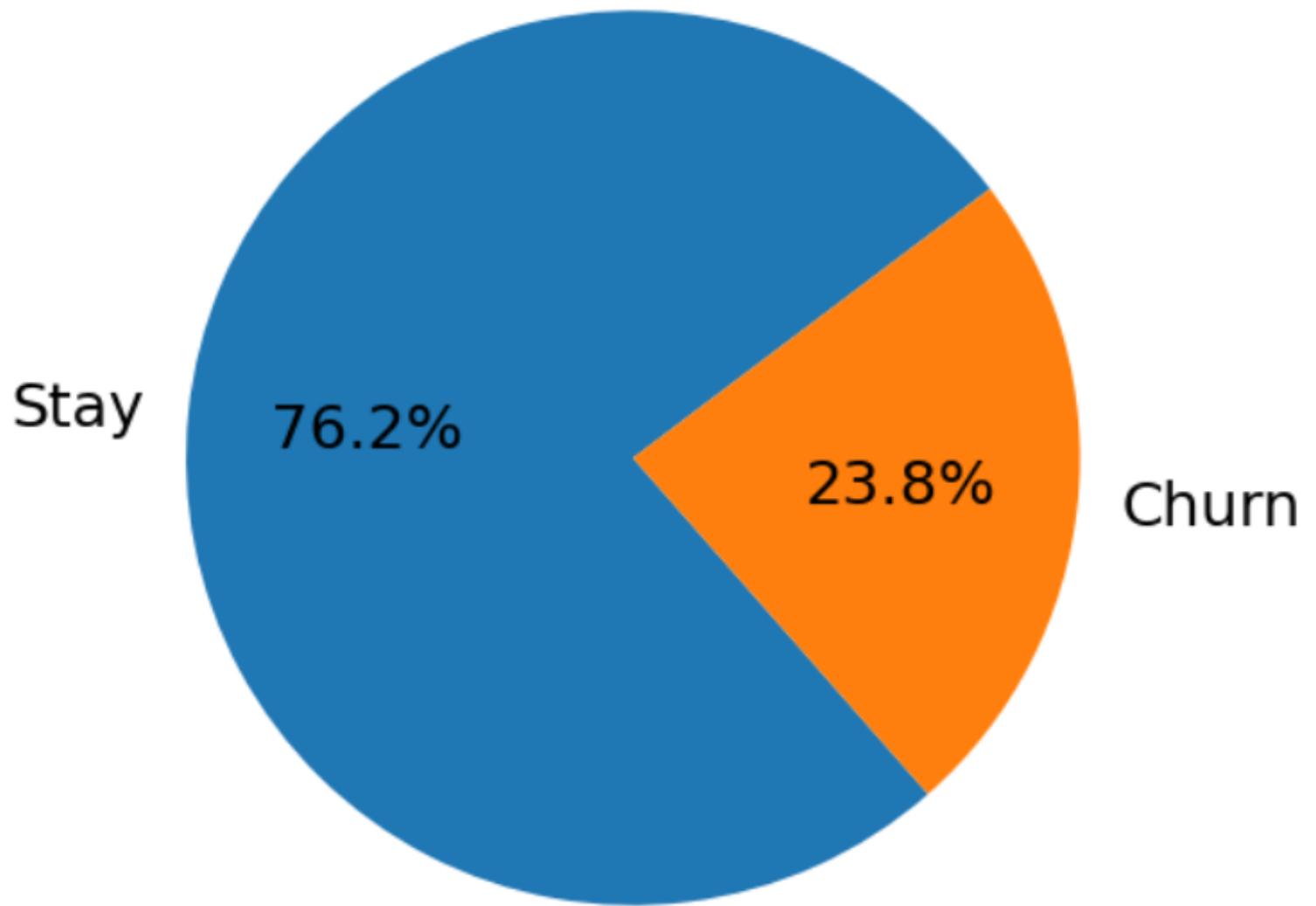
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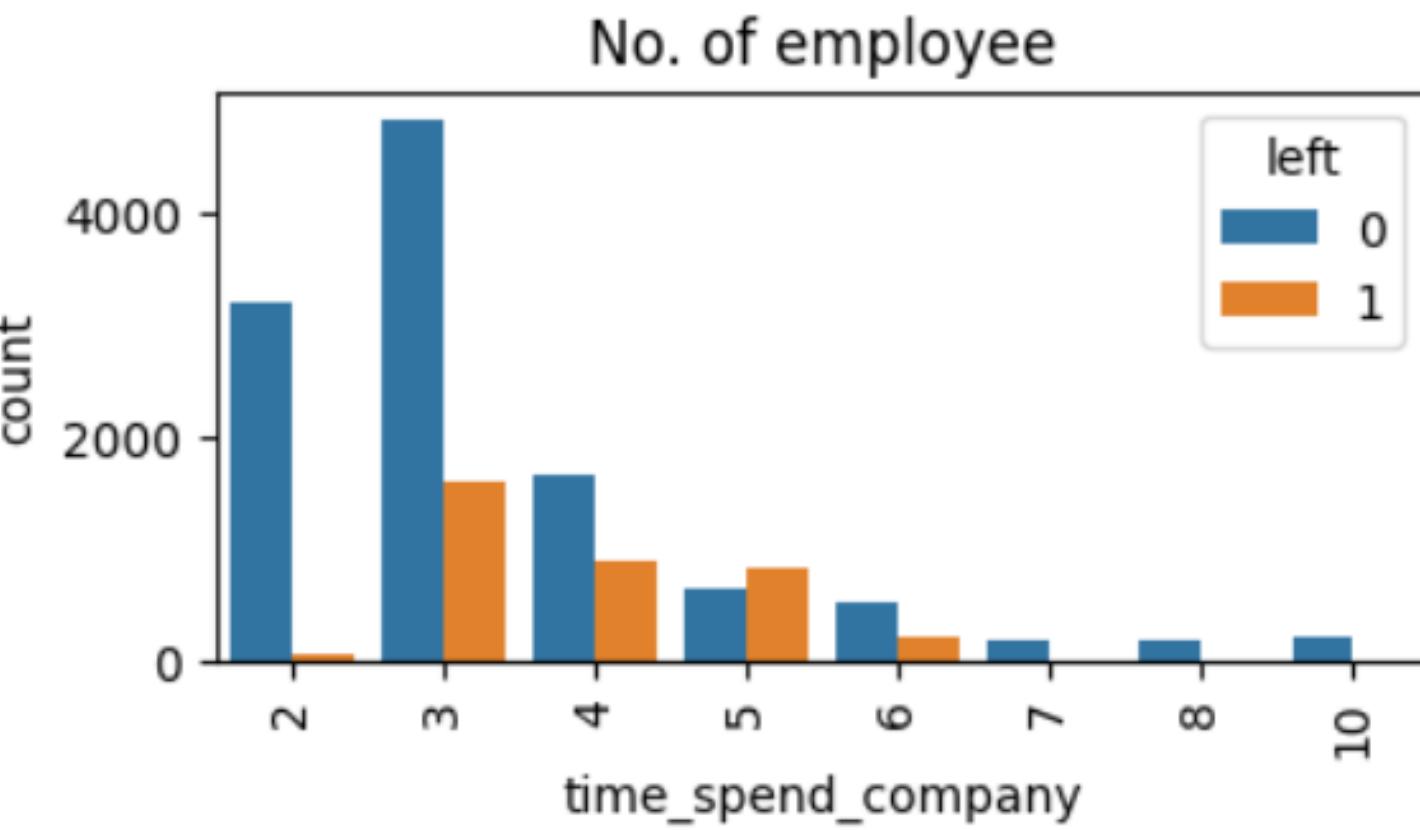
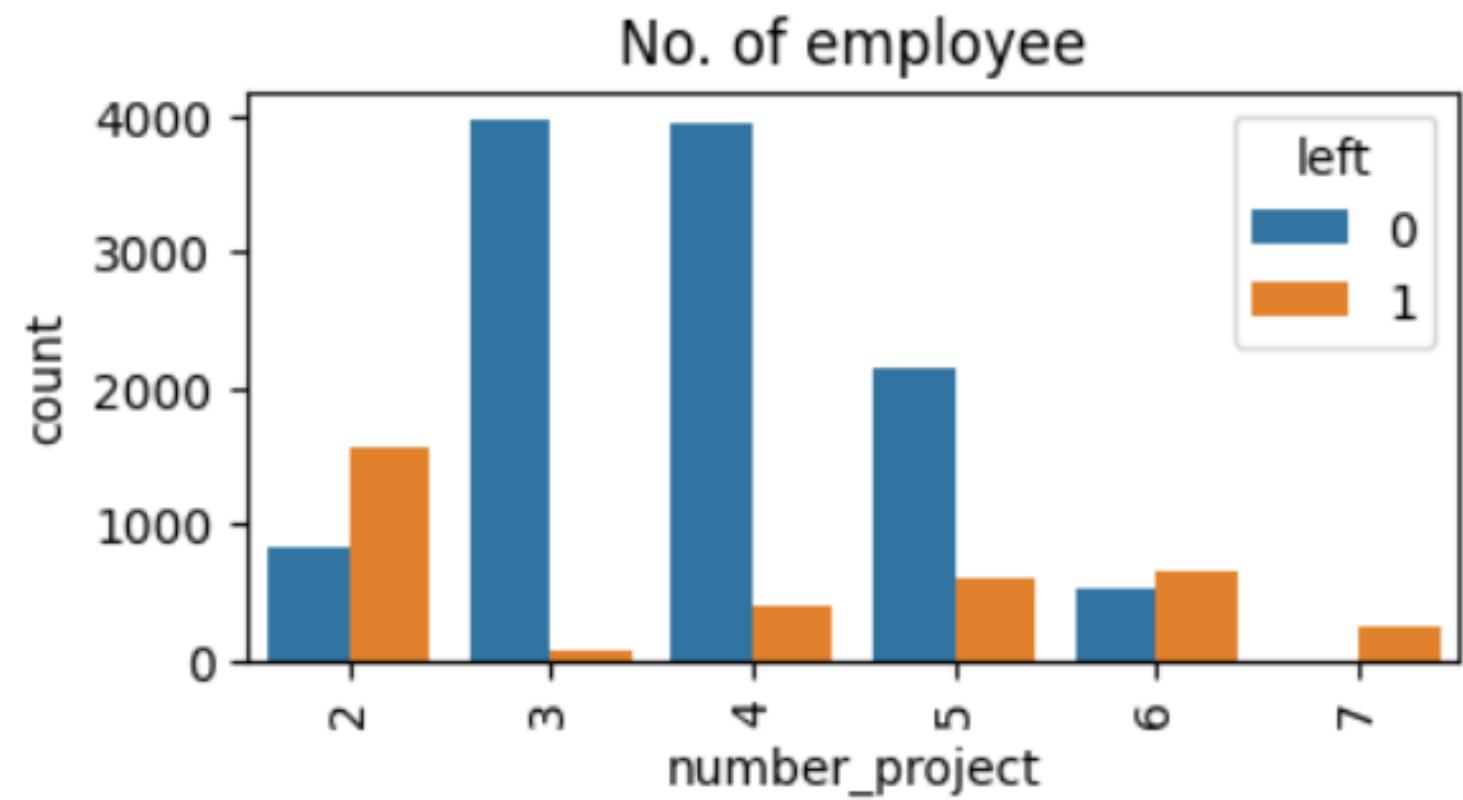
# Data Analysis and Visualization

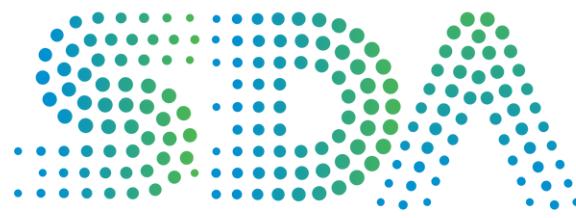


## Employees churn distribution

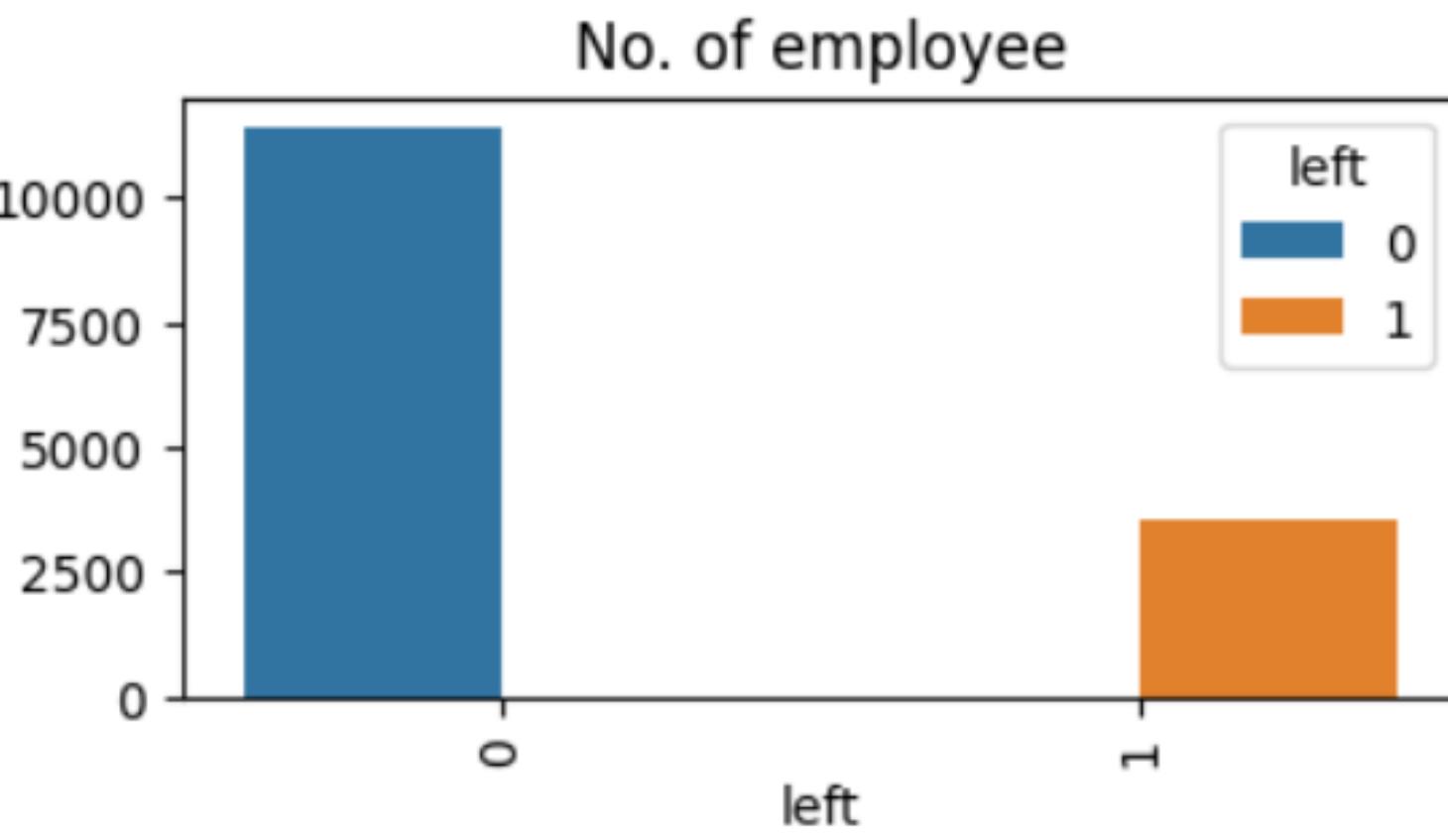
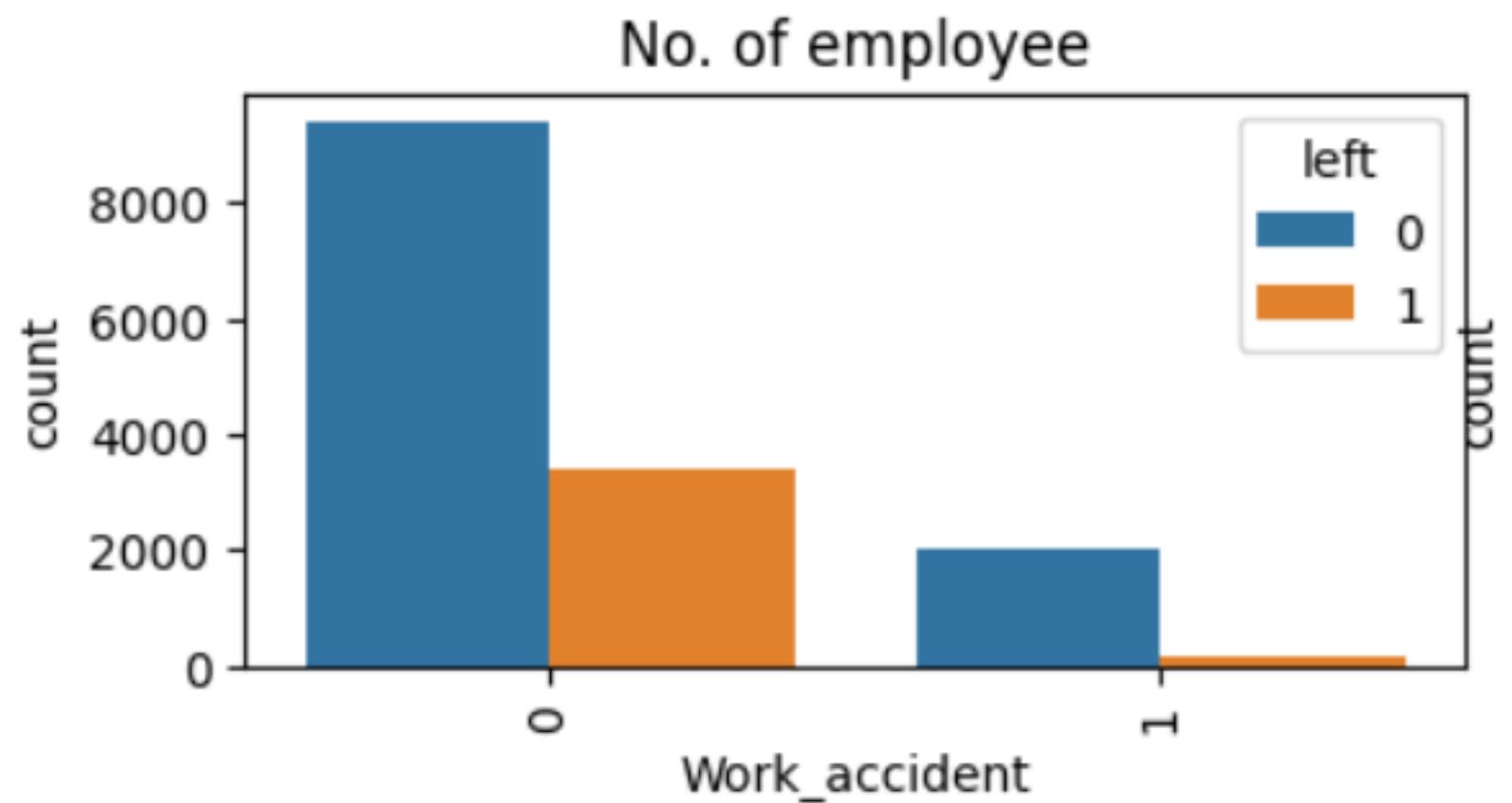


# Employee Departure Analysis Across Factors

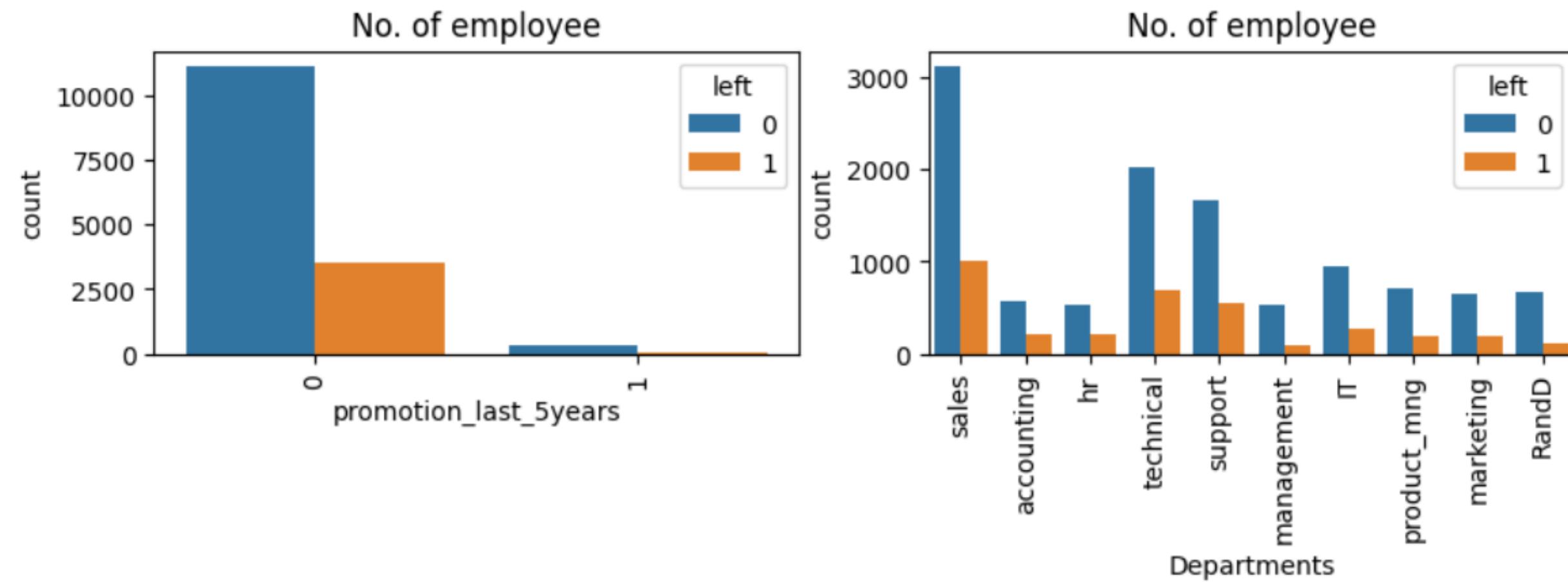


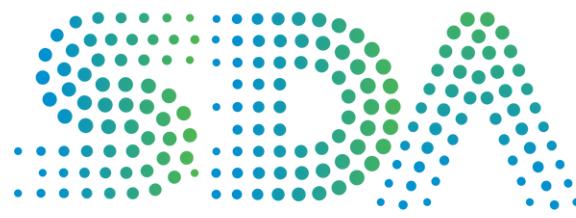


# Employee Departure Analysis Across Factors

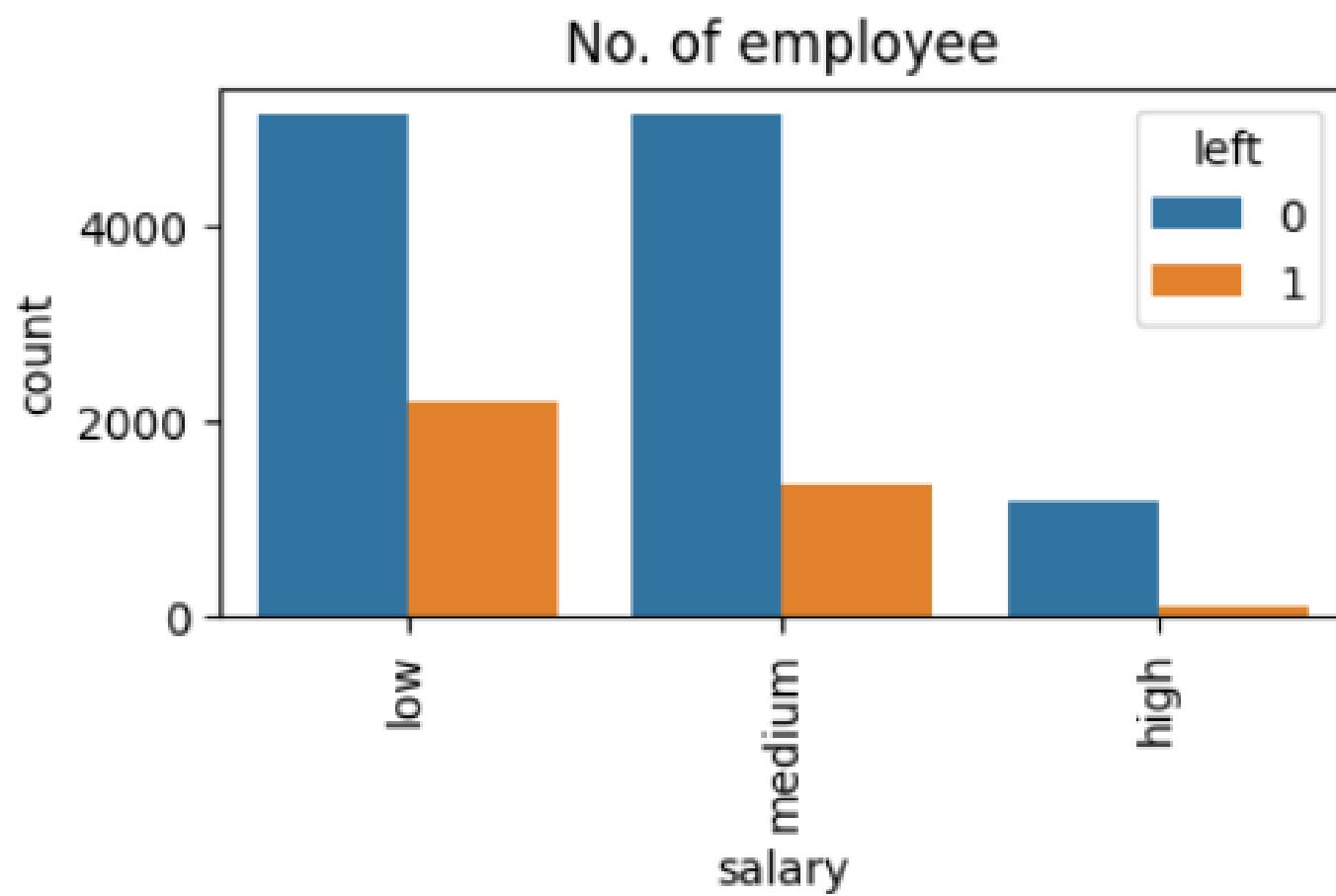


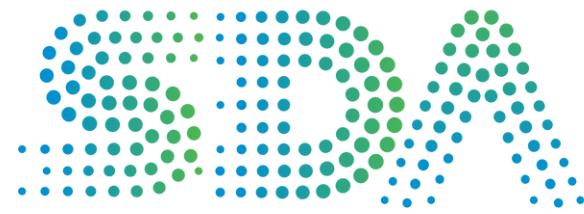
# Employee Departure Analysis Across Factors



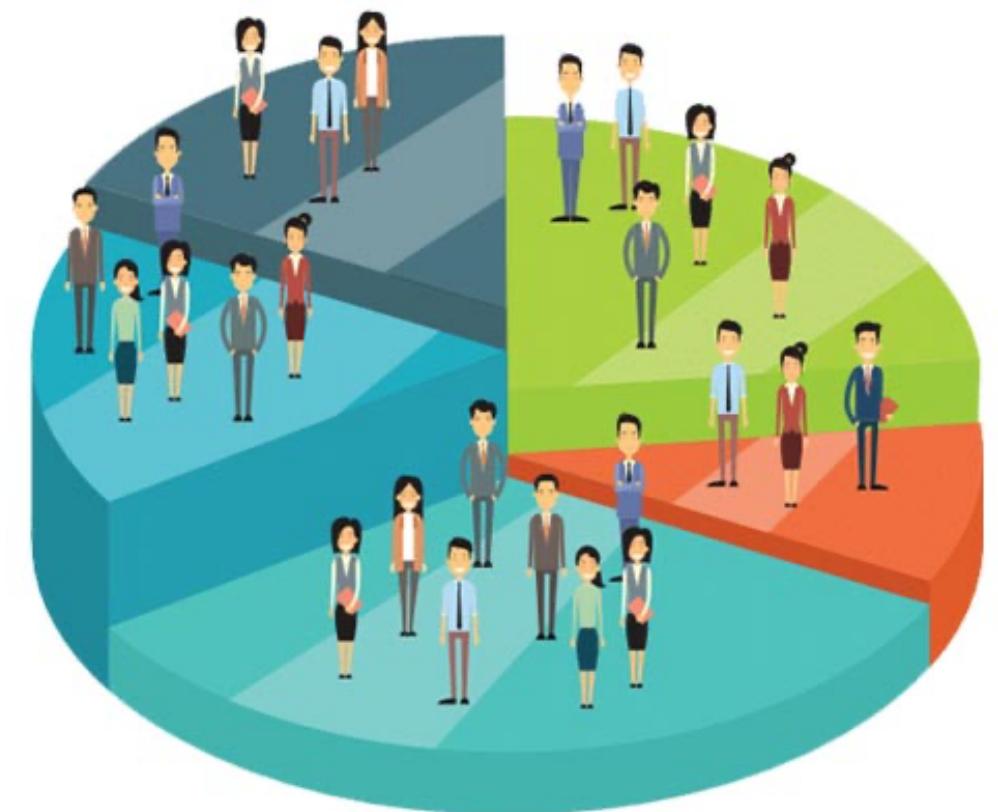


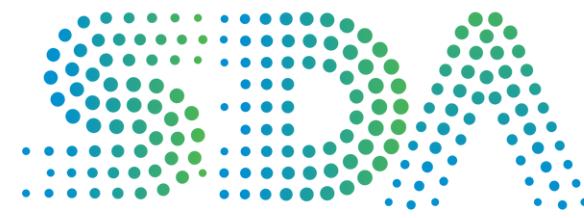
# Employee Departure Analysis Across Factors





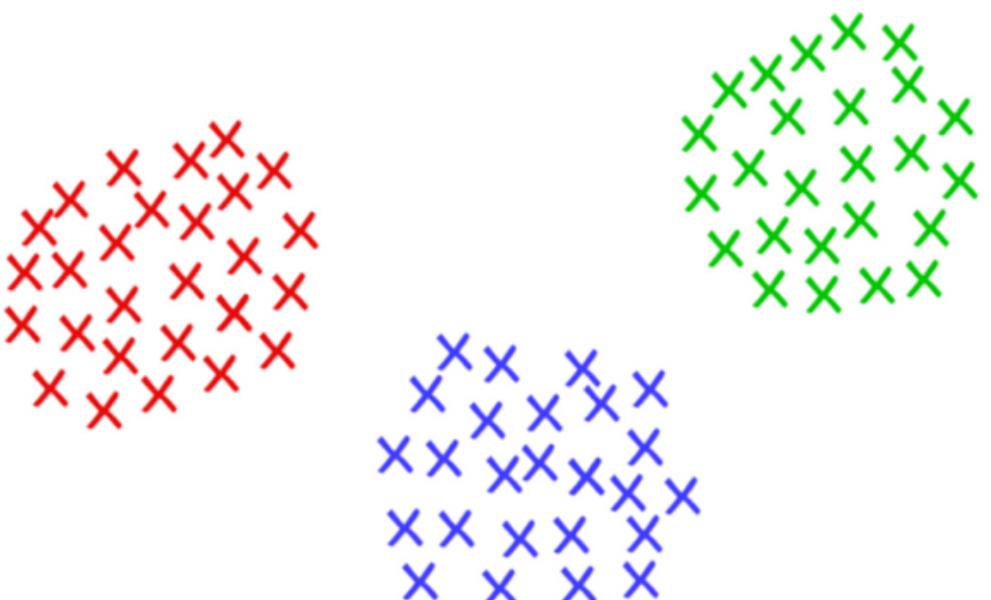
# Clustering

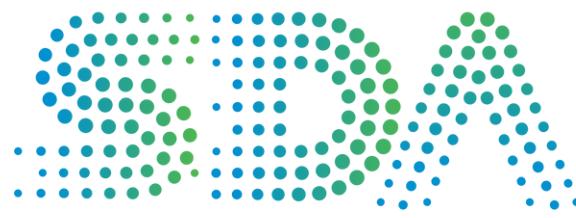




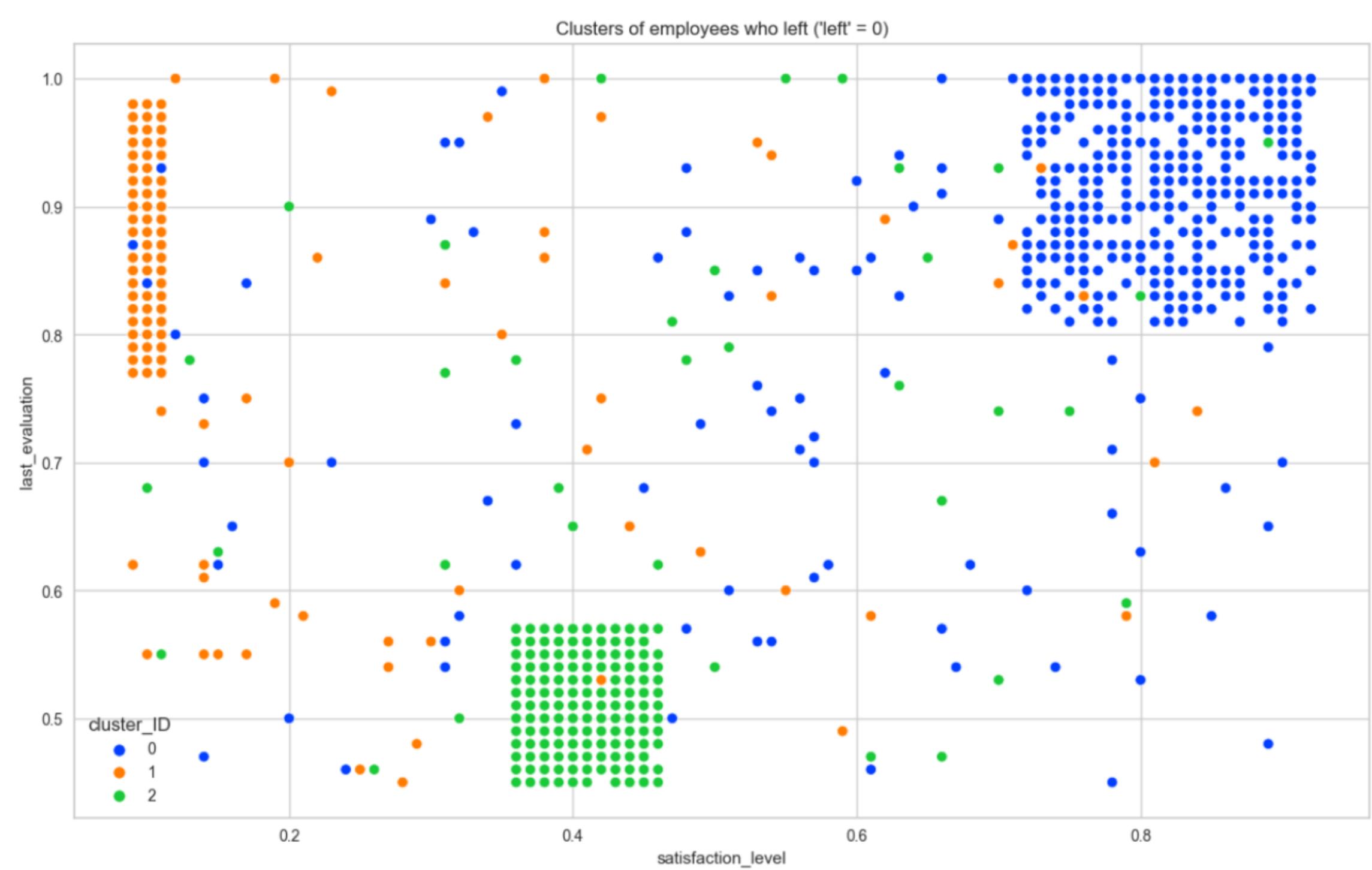
# What is clustering?

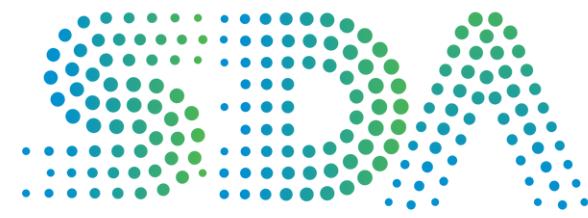
**Grouping similar data points together based on their inherent characteristics or patterns.**





# clustering results

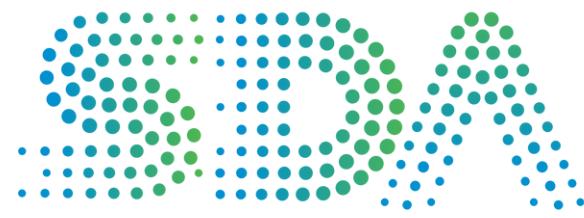




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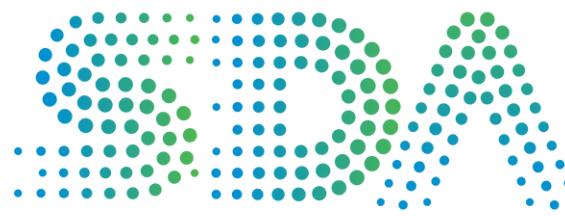
# Predictive Model



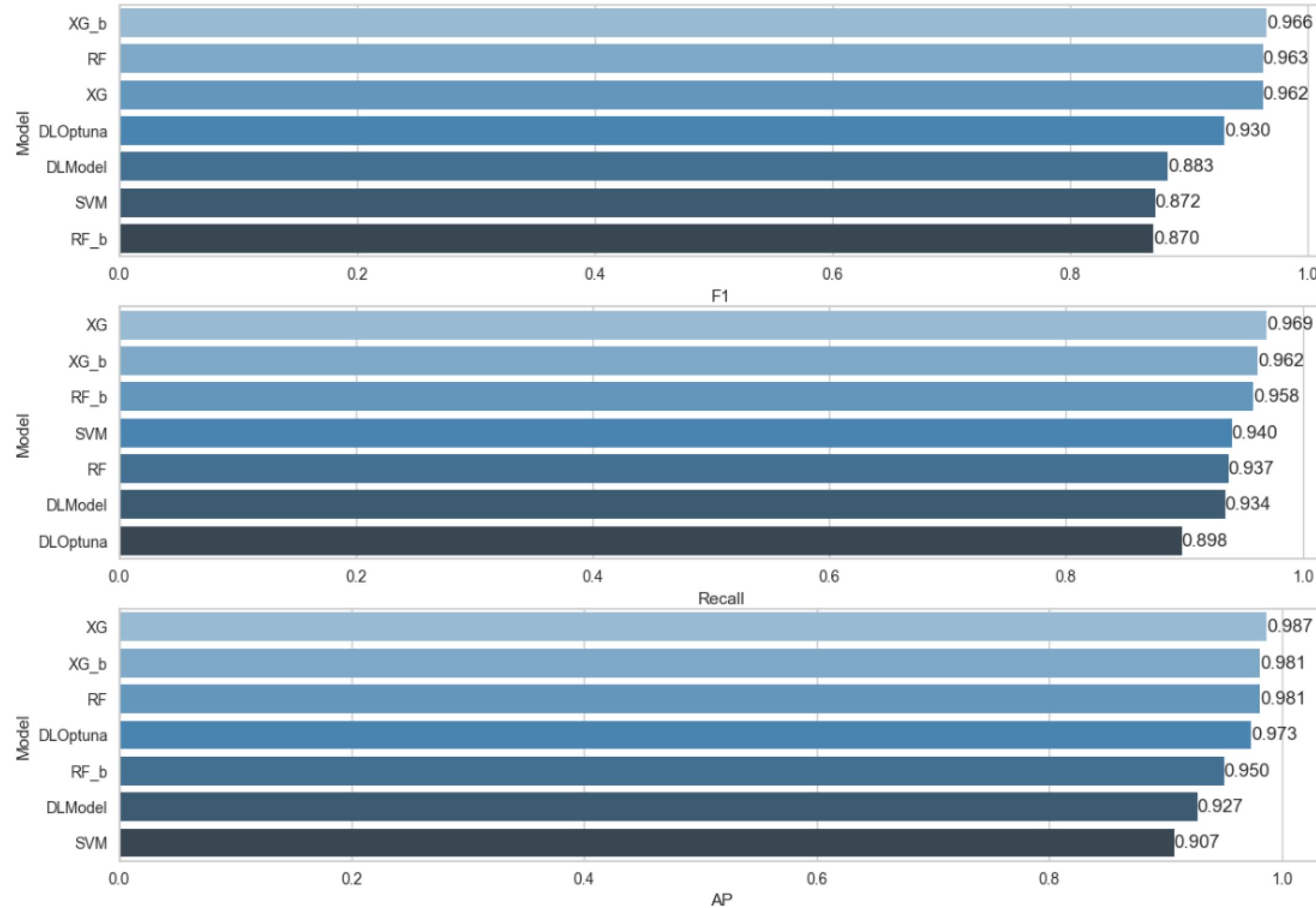
# Predictive Model Building

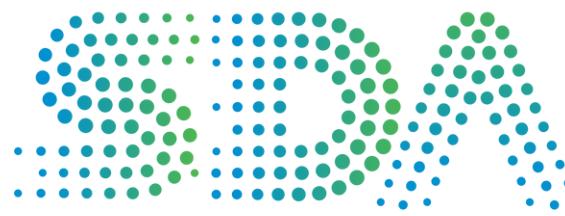
## Classification algorithms we applied:

1. Support Vector Machine (SVM)
2. Random Forest (Bagging)
3. XGBoost (Boosting)
4. Multi Layer perceptrons (MLP)

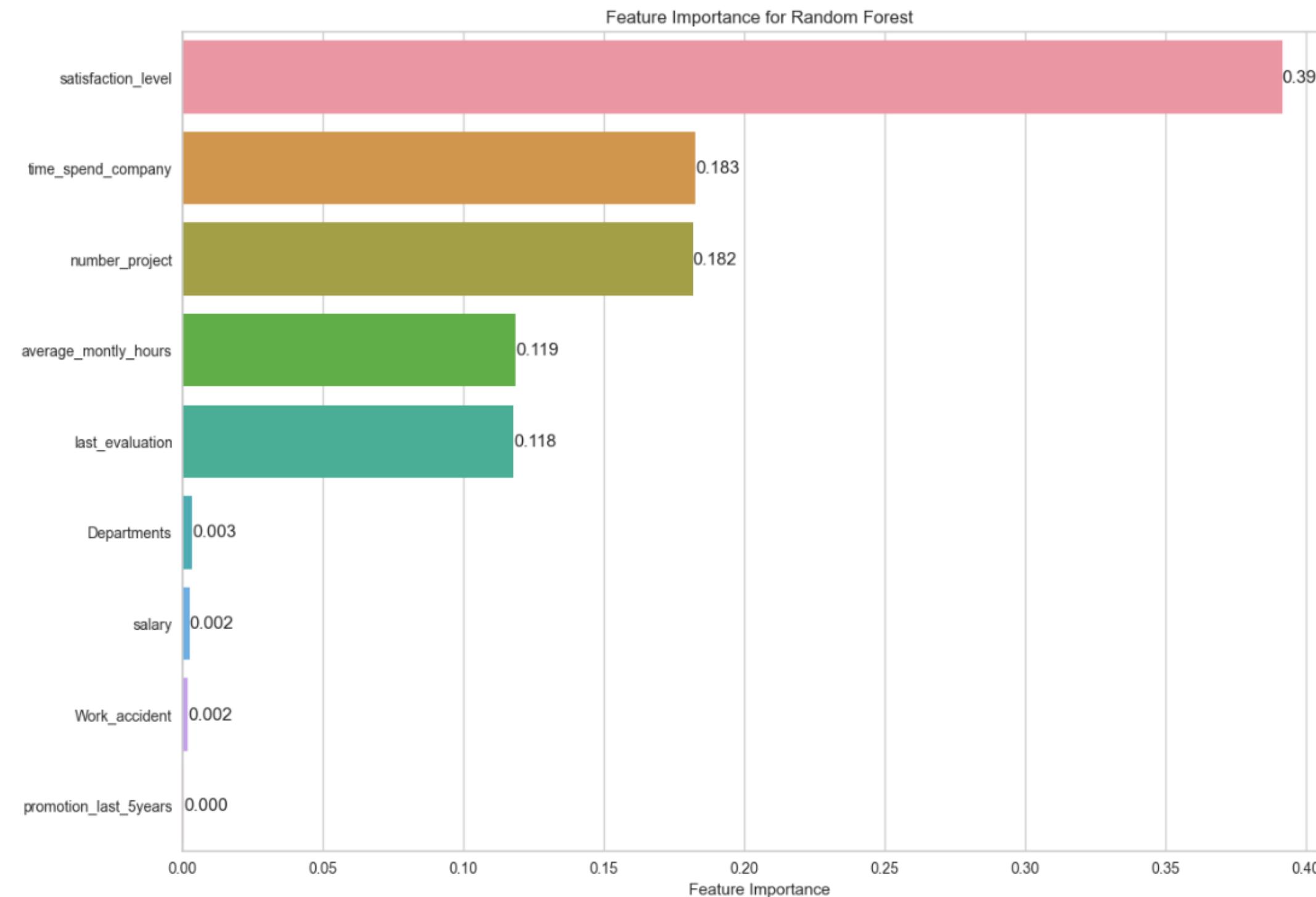


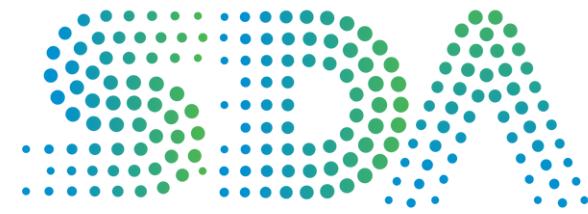
# Predictive Models Results Comparison





# Features Importance for the Best Model





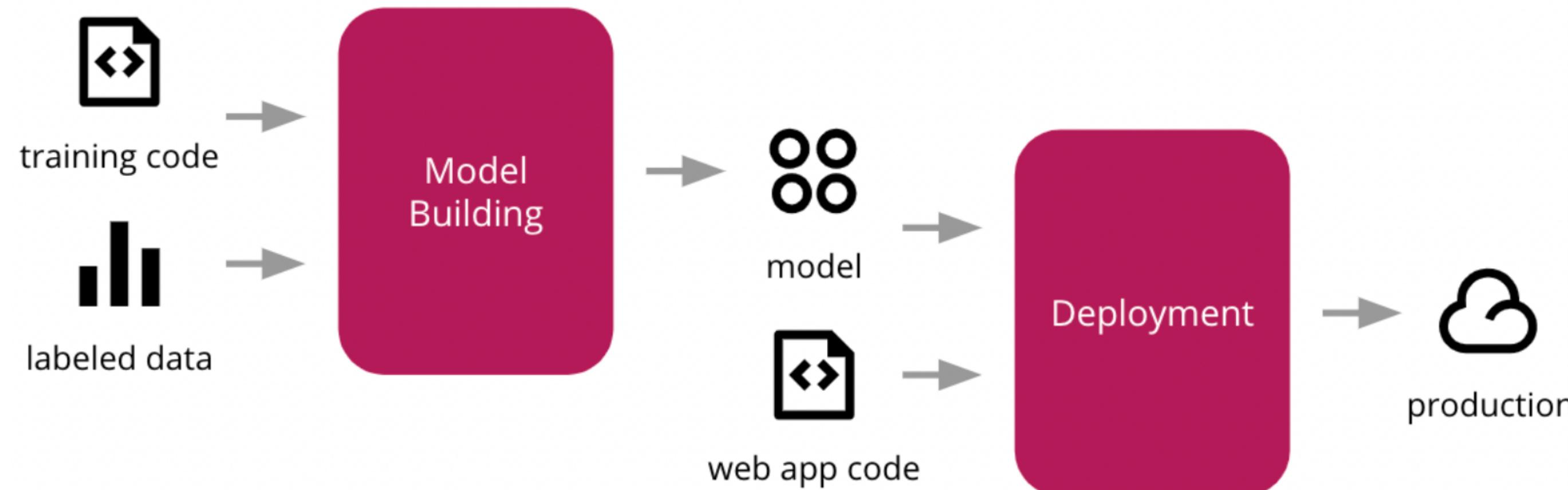
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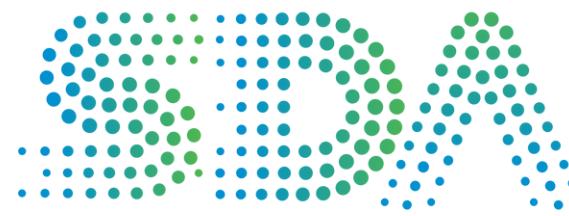


# Model Deployment

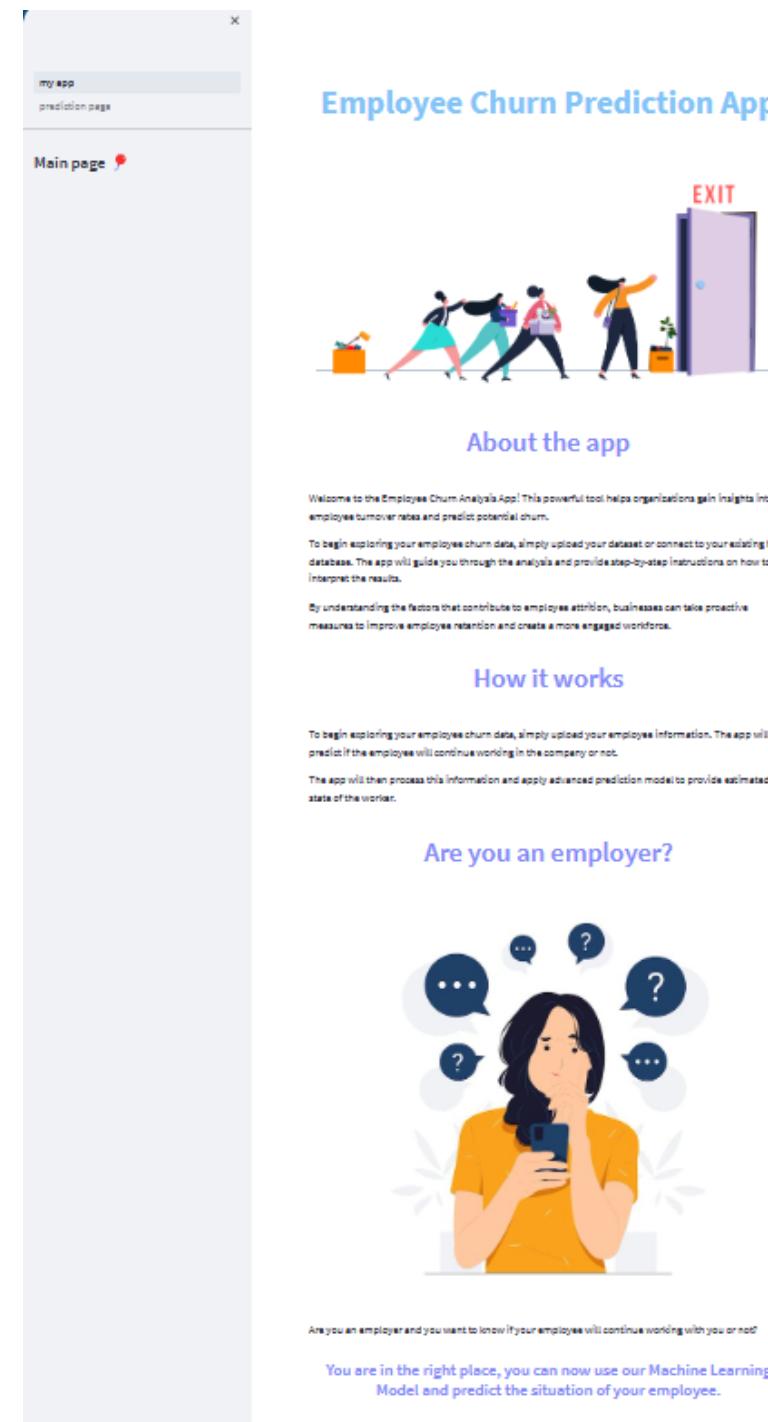
# What is Model Deployment?

**Deployment means putting a machine learning model into action in a real business setting to make decisions based on data. It's one of the last steps in the machine learning process. In this project we deployed our ML model with Streamlit on AWS.**

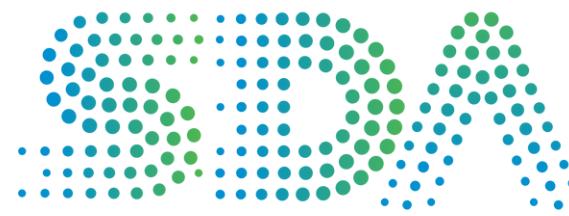




# Employee Churn Prediction App



The screenshot shows the main page of the Employee Churn Prediction App. At the top, there's a header bar with the text "my app" and "prediction page". Below the header, a red circular icon indicates "Main page 1". The main content area has a light gray background. At the top right, the text "Employee Churn Prediction App" is displayed in blue. In the center, there's a small illustration of three people walking away from a building towards an "EXIT" door. Below this, a section titled "About the app" contains text about the tool's purpose and how it can help organizations gain insights into employee turnover rates and predict potential churn. Another section, "How it works", provides a brief overview of the process. At the bottom, a section titled "Are you an employer?" features an illustration of a woman holding a smartphone with speech bubbles around her head, suggesting communication or decision-making. Small descriptive text at the very bottom relates to employers wanting to know if their employees will continue working with them.



# Employee Churn Prediction App

Now, you can predict with ML 🎉

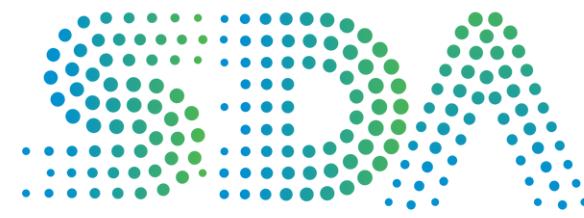


The values you have chosen:

	Employee information
satisfaction_level	0.00
last_evaluation	0.00
number_project	1
average_montly_hours	90
time_spend_company	1

Predict

Select values first...



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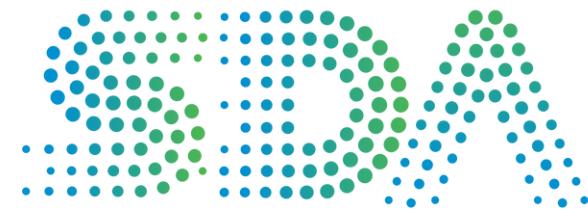
# Visit Our App



Demo



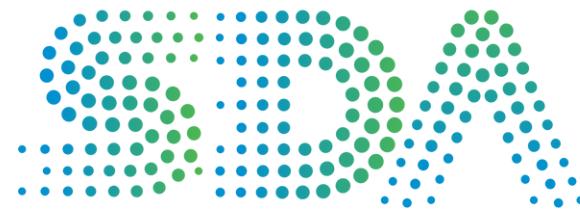
URL



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# Conclusion



In this project we deploy a Streamlit app that predicts employees churn based on user inputs. The app loads a trained Random Forest classifier model and applies it to the user input data to predict whether or not the employee is likely to churn.



The background features a minimalist design with abstract, flowing blue lines. These lines are thin and light blue, creating a sense of motion and depth. They form a large, sweeping arc that spans from the top left towards the bottom right, and another smaller, more vertical set on the right side. The overall aesthetic is clean and modern, with a focus on negative space.

# Thanks for Listening