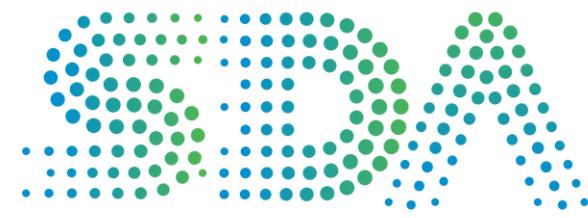


Churn Prediction Project

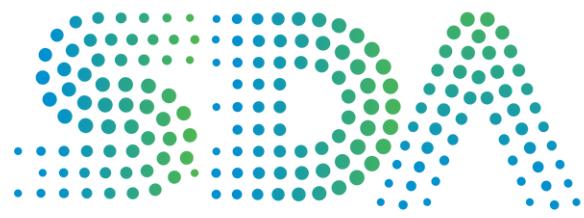
By: G-1 Team





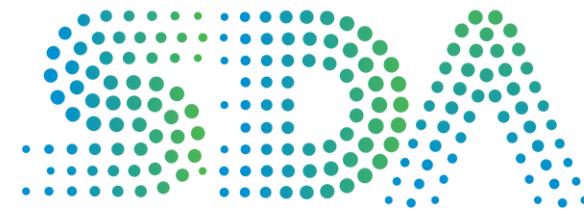
G-1 Team Members

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



Outlines:

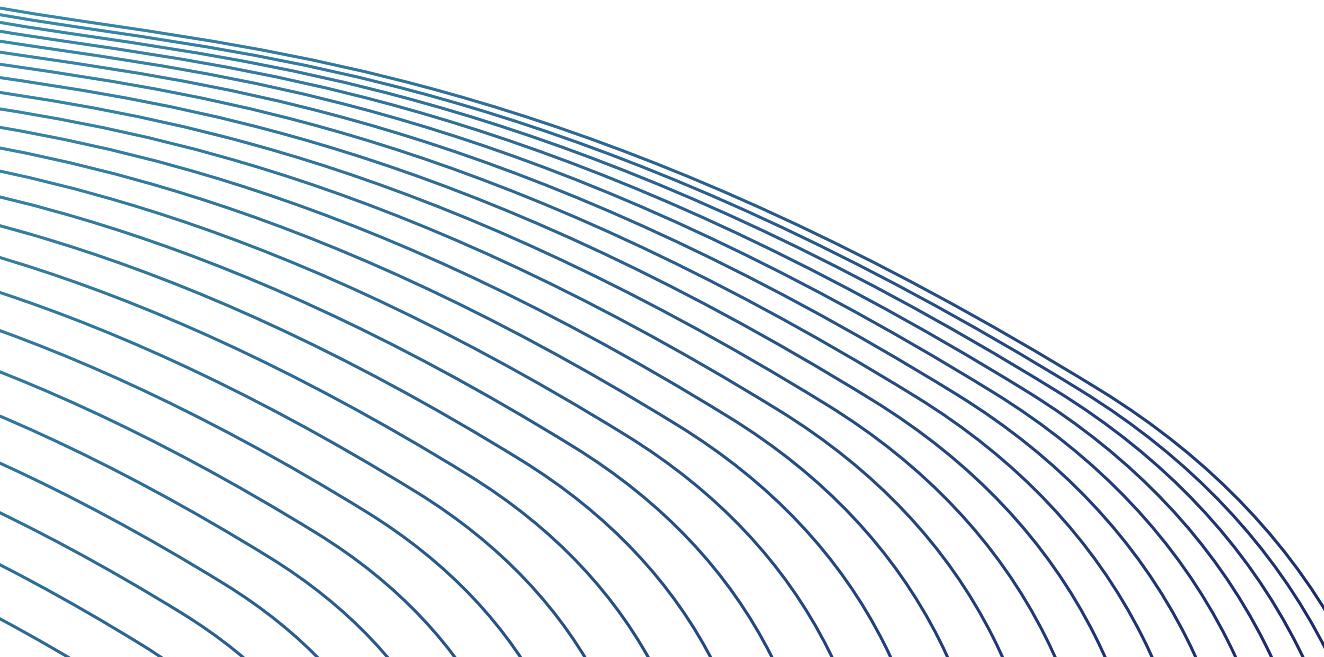
- Project Overview
- Data Analysis and Visualization
- Clustering
- Predictive Model
 - SVM model
 - RF model
 - XG Boost model
 - Multi Layer perceptrons
- Model Deployment
- Conclusion

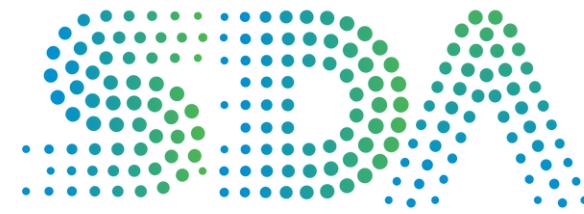


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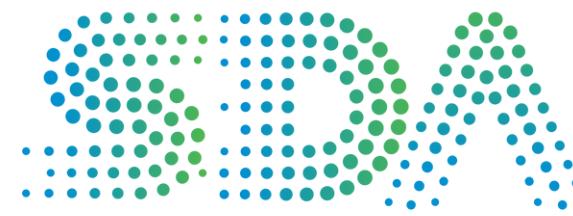
Project Overview





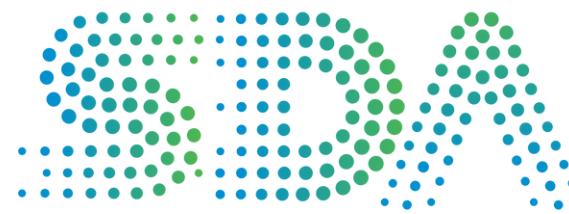
Problem Statement

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

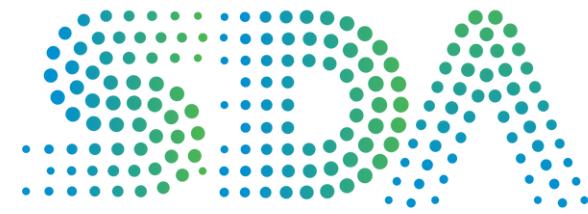
Develop a robust predictive model leveraging HR data to accurately forecast employee churn, enabling companies to proactively address retention strategies and reduce attrition rates



Dataset

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

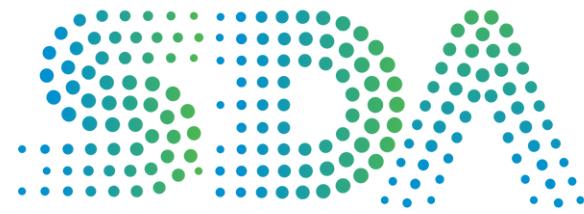
satisfaction_level	last_evaluation	number_project	average_montly_hours	time_spend_company	Work_accident	left	promotion_last_5years	Departments	salary
0.38	0.53	2	157	3	0	1	0	sales	low
0.80	0.86	5	262	6	0	1	0	sales	medium
0.11	0.88	7	272	4	0	1	0	sales	medium
0.72	0.87	5	223	5	0	1	0	sales	low
0.37	0.52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



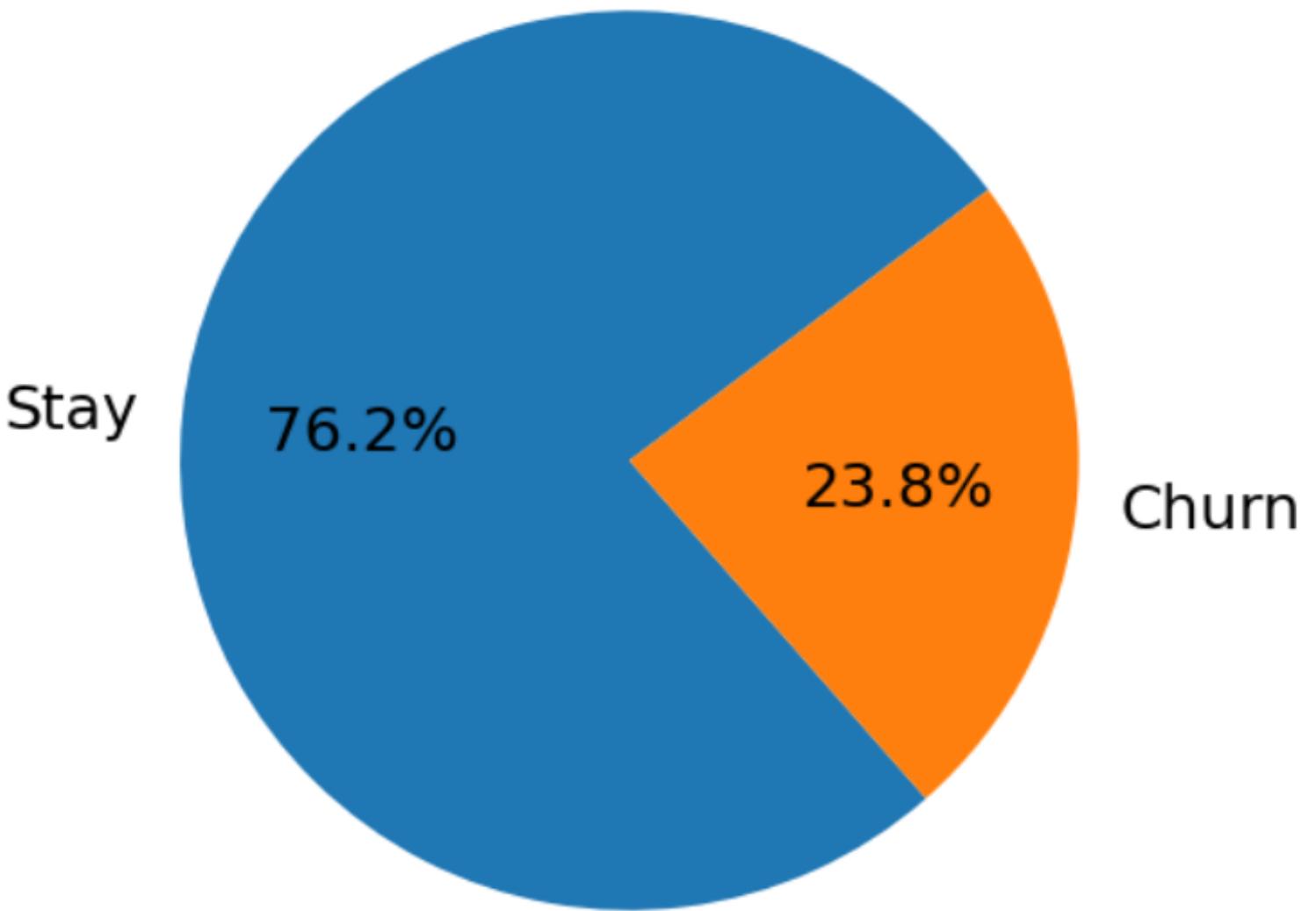
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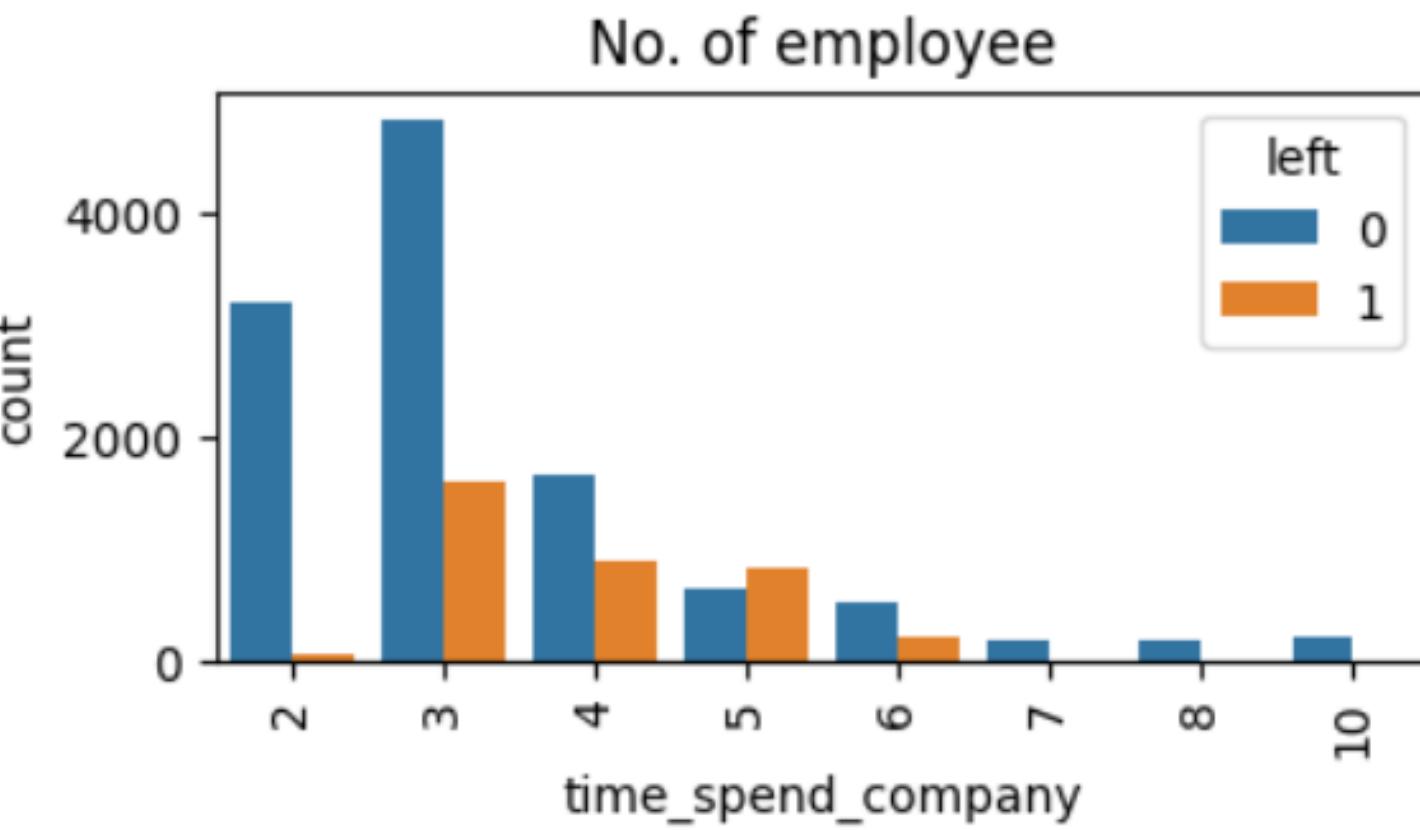
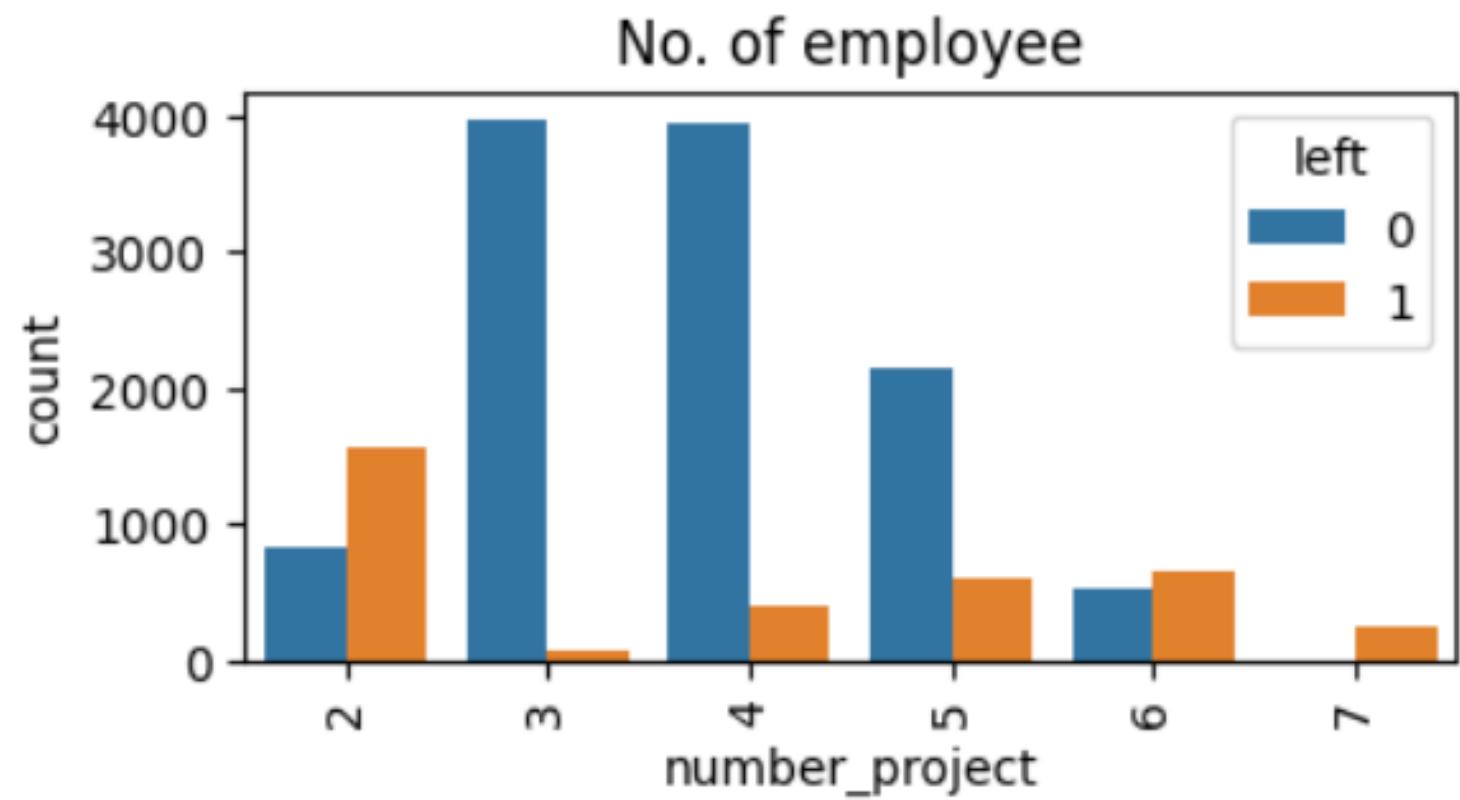
Data Analysis and Visualization

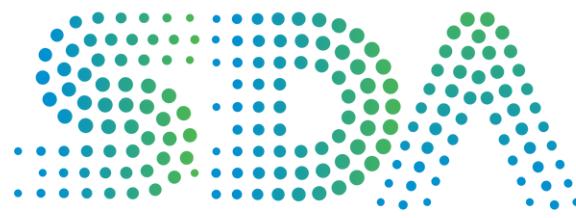


Employees churn distribution

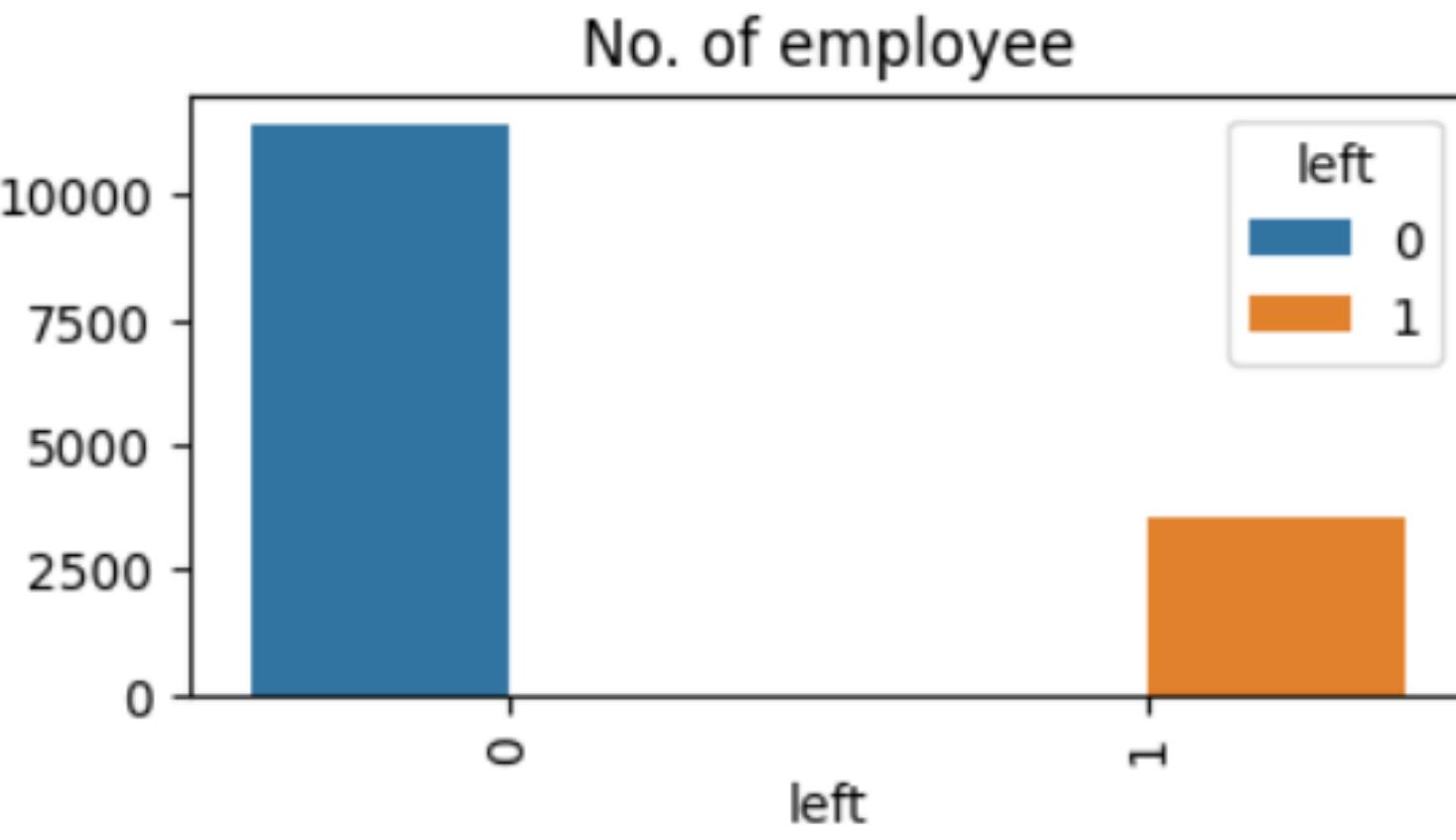
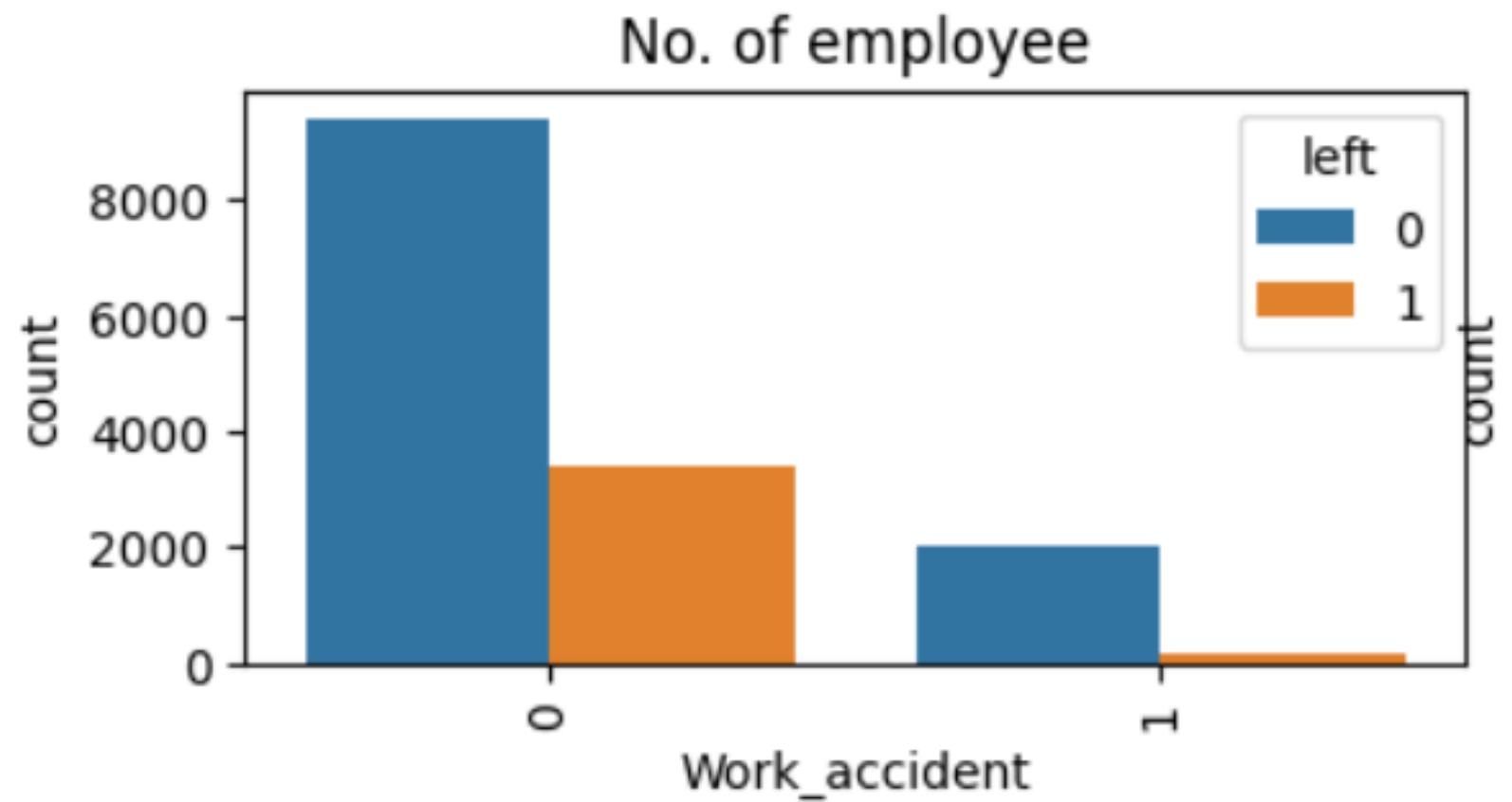


Employee Departure Analysis Across Factors

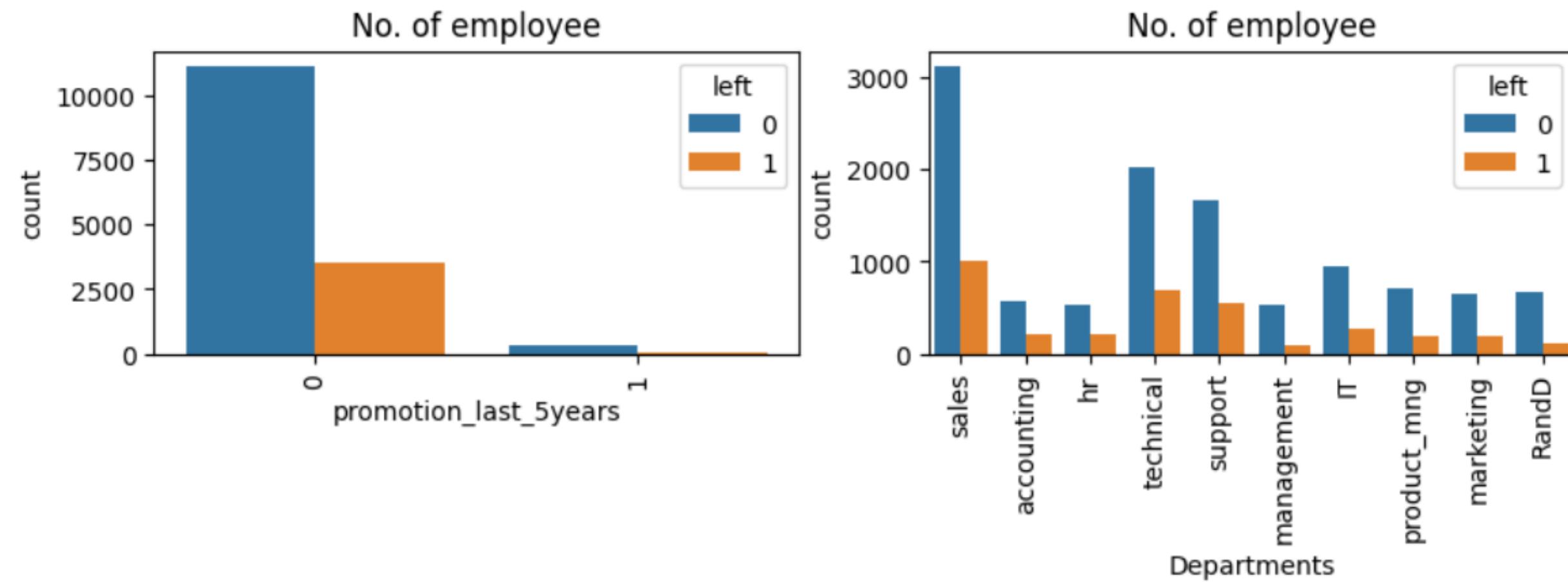


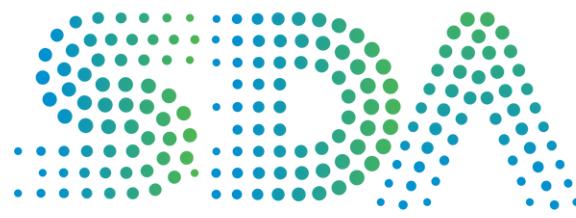


Employee Departure Analysis Across Factors

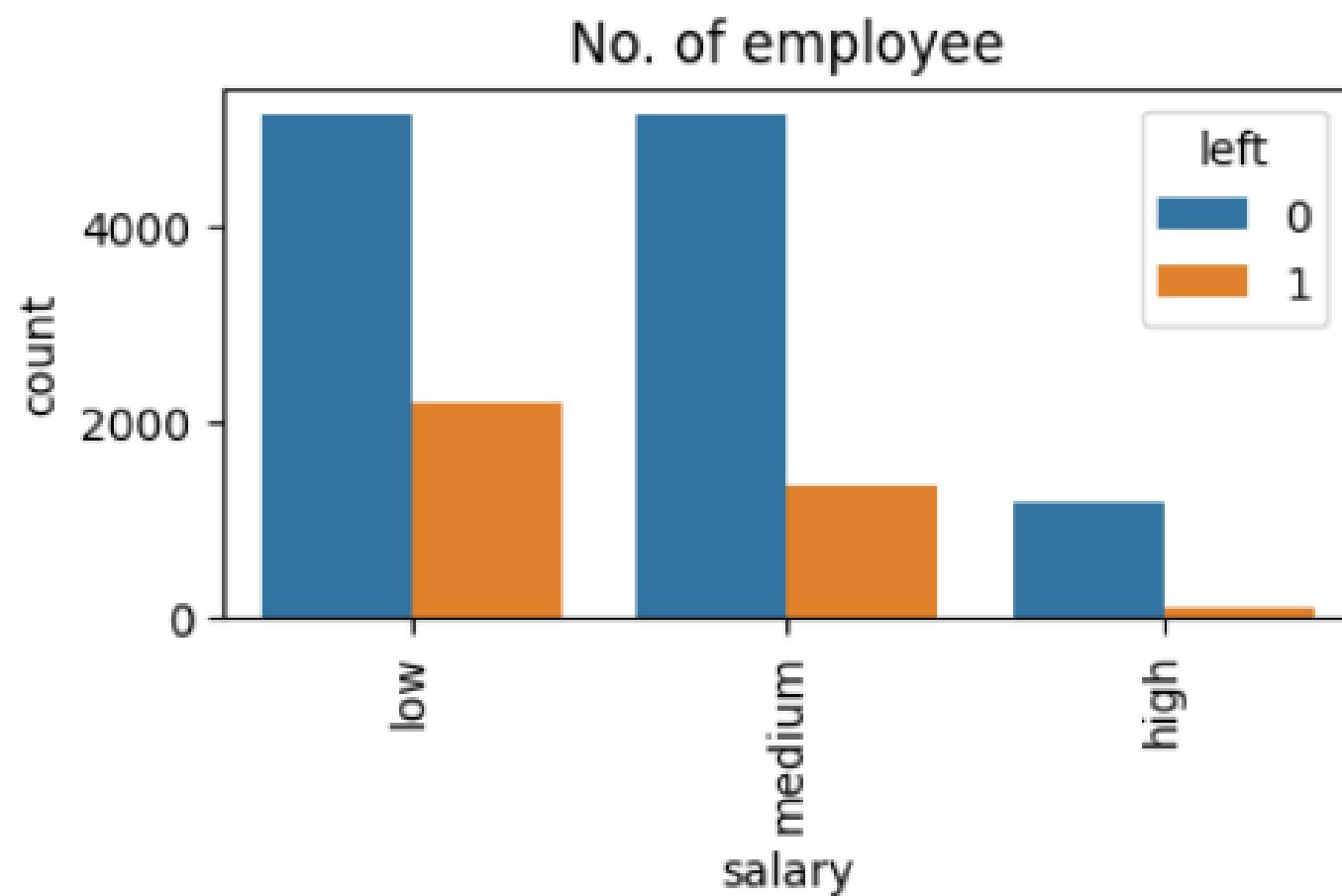


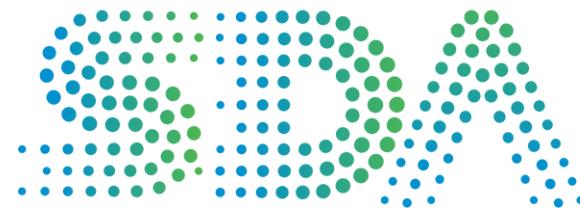
Employee Departure Analysis Across Factors



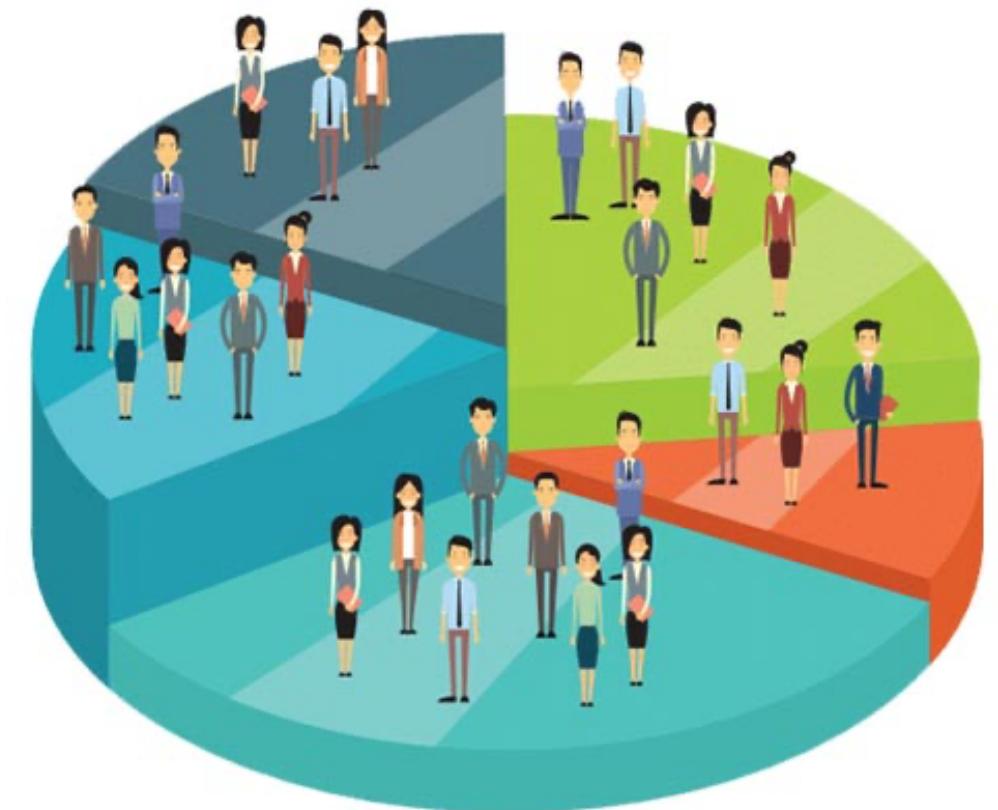


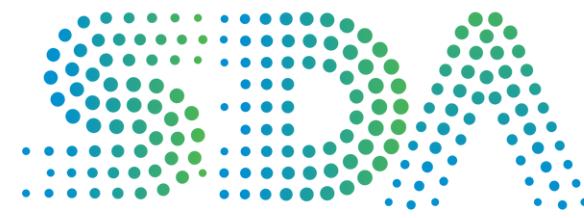
Employee Departure Analysis Across Factors





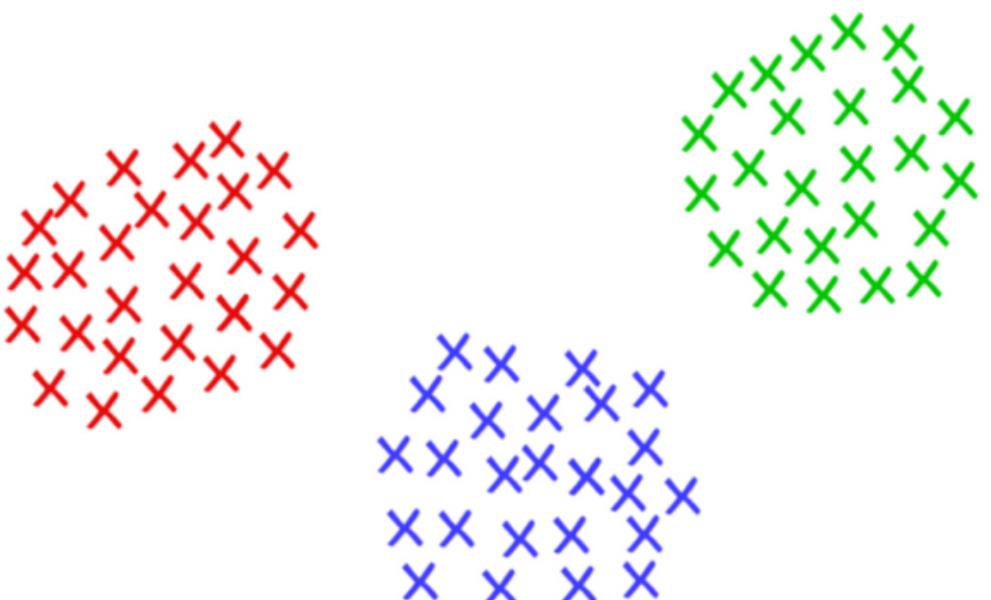
Clustering

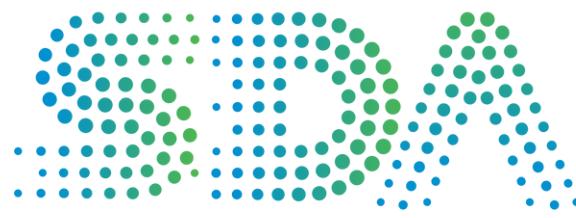




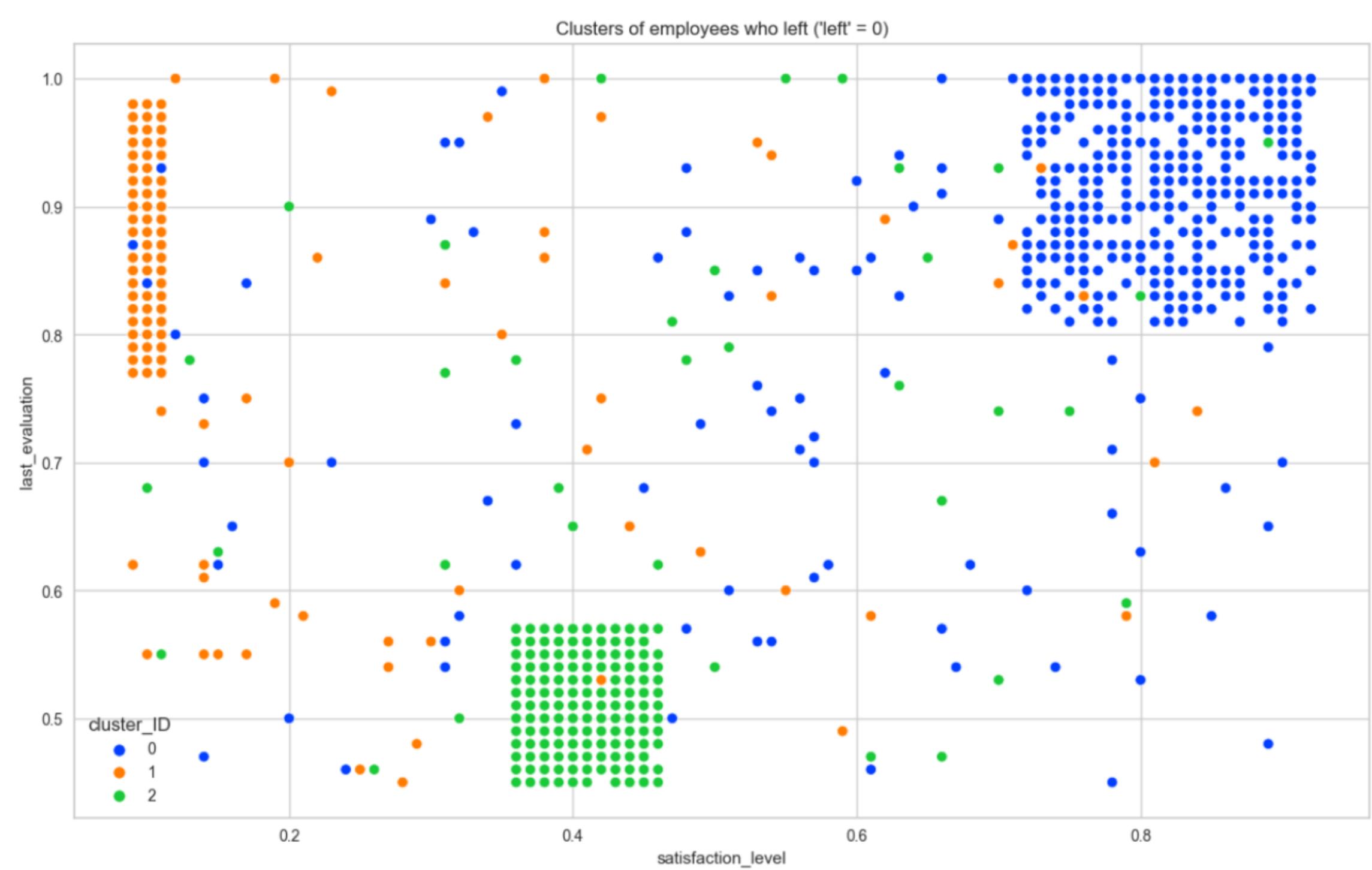
What is clustering?

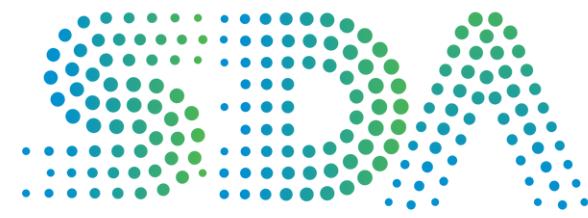
Grouping similar data points together based on their inherent characteristics or patterns.





clustering results

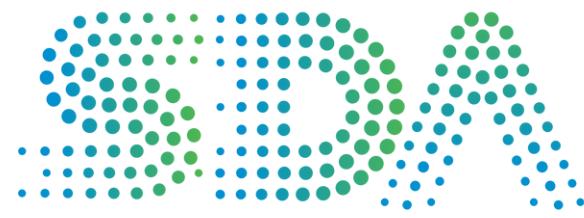




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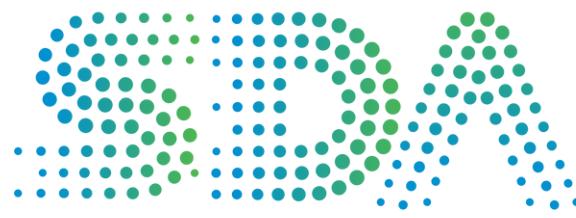
Predictive Model



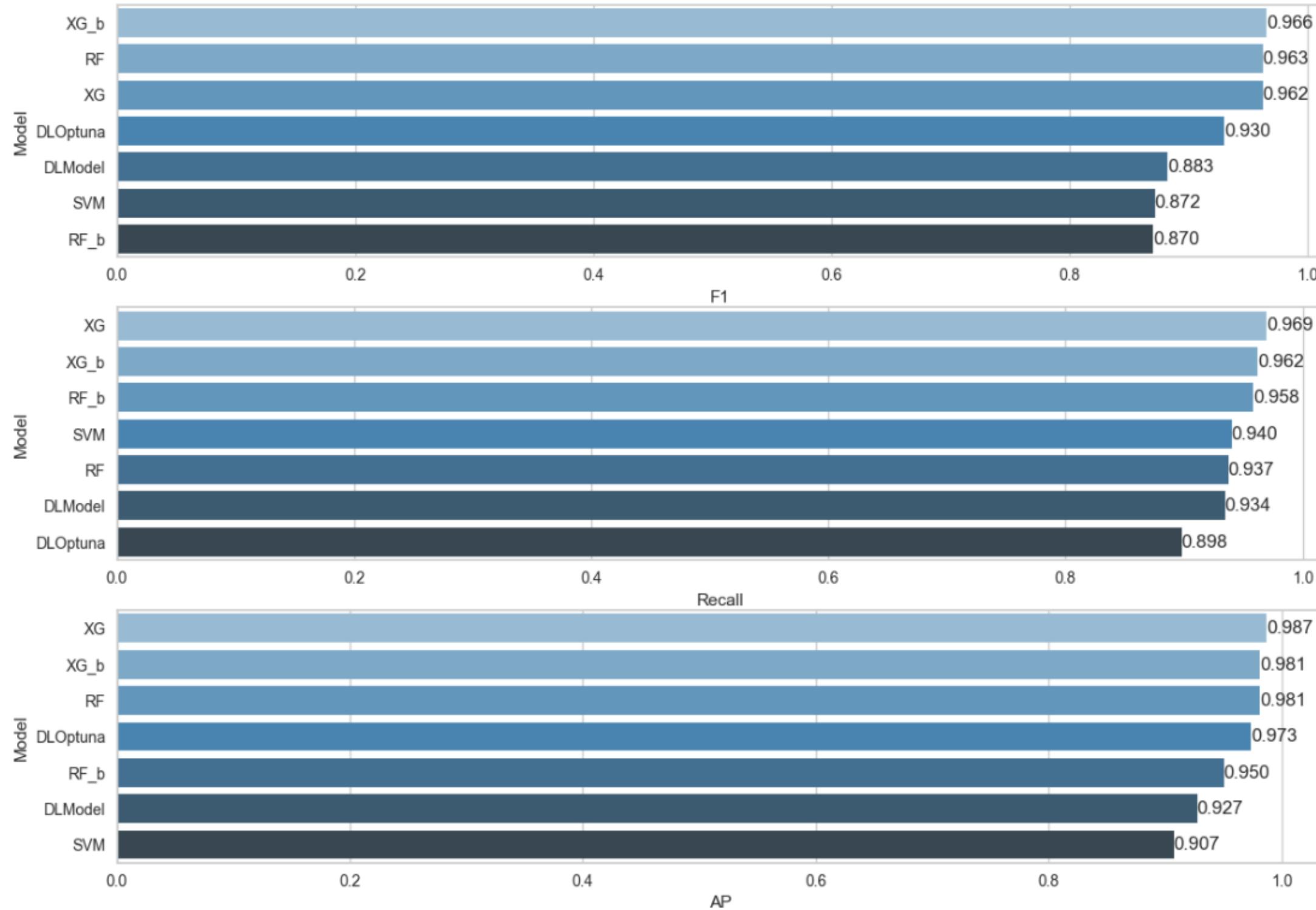
Predictive Model Building

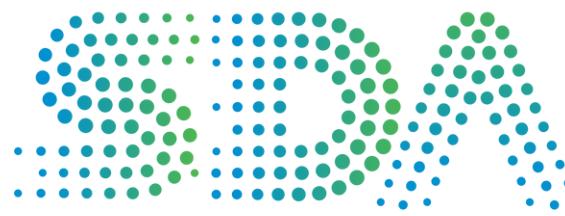
Classification algorithms we applied:

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

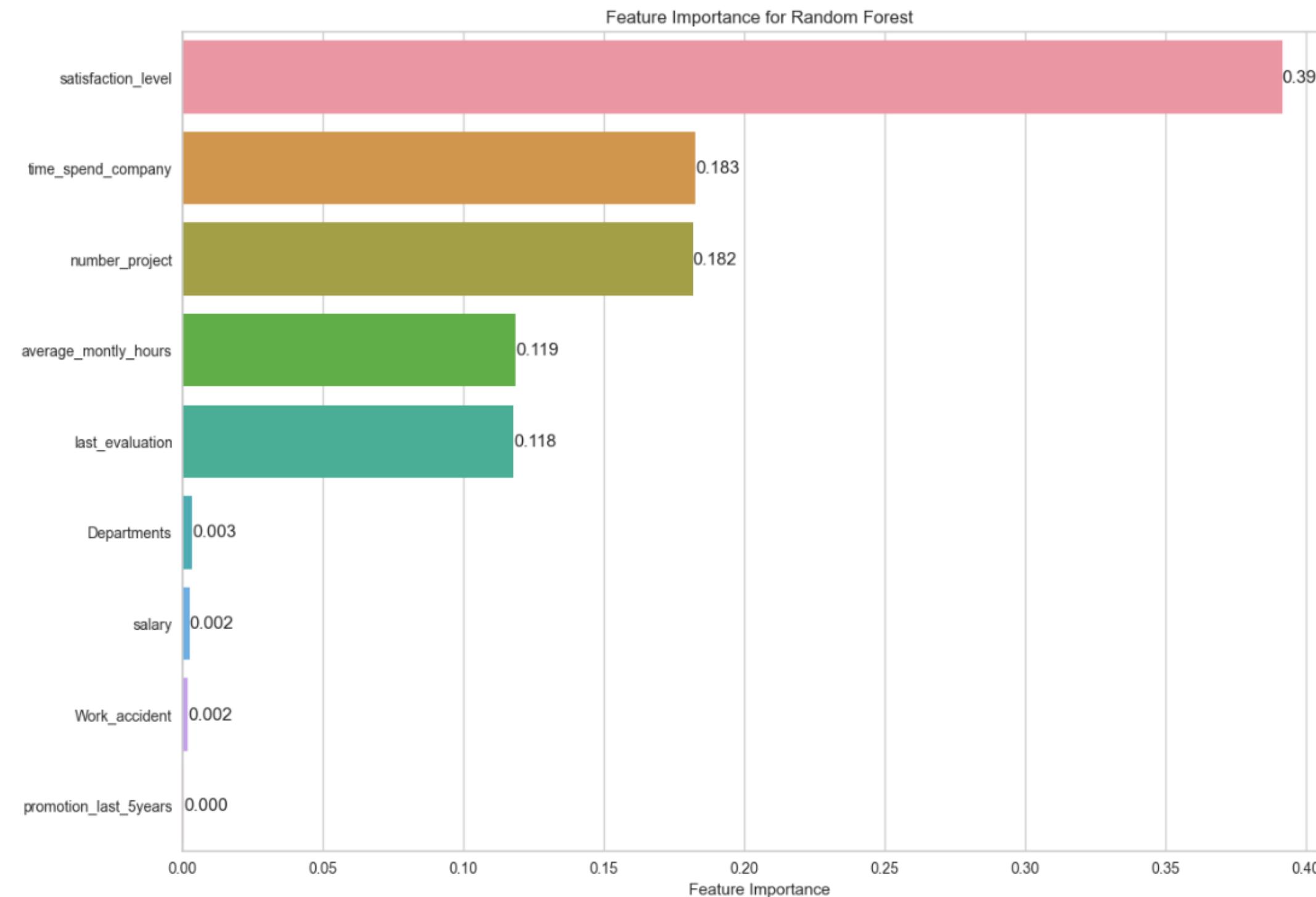


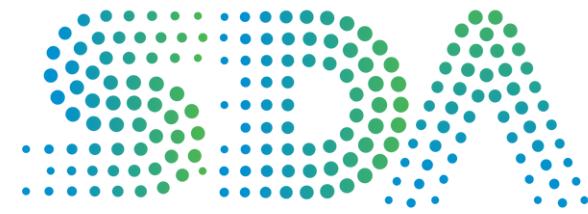
Predictive Models Results Comparison





Features Importance for the Best Model





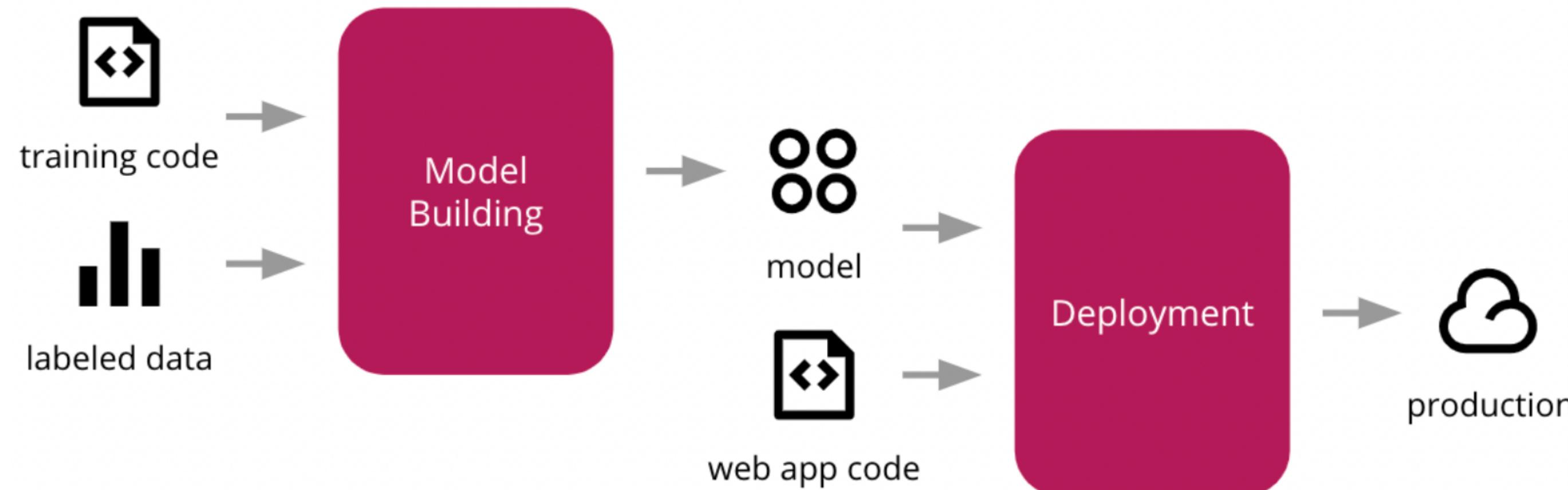
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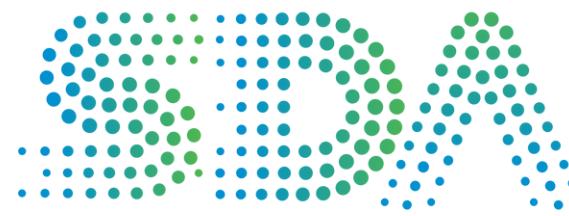


Model Deployment

What is Model Deployment?

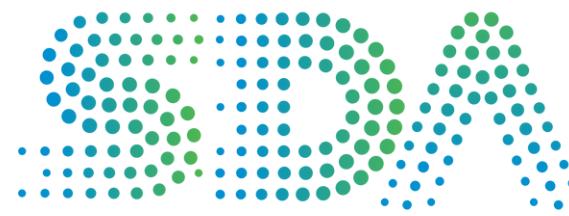
Deployment means putting a machine learning model into action in a real business setting to make decisions based on data. It's one of the last steps in the machine learning process. In this project we deployed our ML model with Streamlit on AWS.





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 notification bubble says "Main page 1". The main content area has a blue header "Employee Churn Prediction App". It features a small illustration of three people walking away from a building labeled "EXIT". Below this is a section titled "About the app" which contains descriptive text and a "Read more" link. Another section titled "How it works" also includes explanatory text and a "Read more" link. At the bottom, there's a section titled "Are you an employer?" with an illustration of a woman holding a smartphone surrounded by question marks. Small text at the very bottom reads: "Are you an employer and you want to know if your employee will continue working with you or not? You are in the right place, you can now use our Machine Learning Model and predict the situation of your employee."



Employee Churn Prediction App

Now, you can predict with ML 🎉

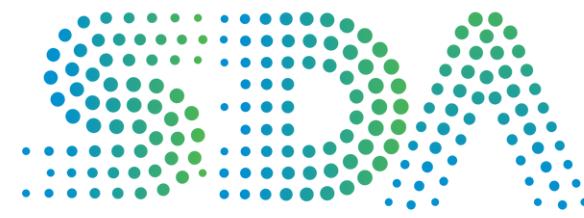


The values you have chosen:

	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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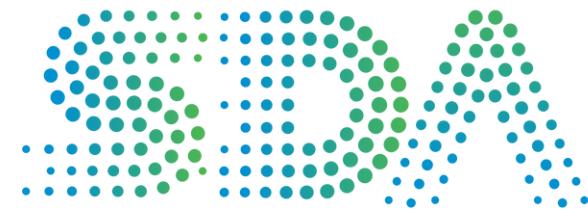
Visit Our App



Demo



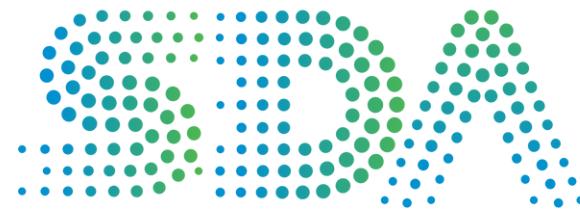
URL



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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 three sets of thin, light blue wavy lines. One set originates from the top left, another from the bottom right, and a third from the center-left, all converging towards the center-right of the frame.

Thanks for Listening