PREDICTING EMPLOYEE TURNOVER

Submitted by

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Content

DEFINING PROJECT AND ITS SCOPE

Understanding of the project: By Developing the Project, any Person can predict turnover of employees in a company/organization , Employees details , organization details and the environment of it required to calculate and predict any turnover of employees. To predict the machine learning techniques. ML, datasets, algorithms, etc. are used in calculating any employees for turnover Furthermore This will help any company/organization to improve their internal system. So that any employee don't turnover on them.

Reason for choosing this project: This Project really fascinates me. And through ML , datasets and some calculation I want to find out why any employee leave or forced to leave or anything else might occur that causes any turnover from employees. That what pulls me in the project.

1. APPROACH OF PROBLEM SOLVING

Approach: First, we load the dataset and take a glimpse. The data set is a combination of mathematical and non-mathematical elements,

with various ranges of values and some missing points. We pre-process the dataset so that the selected ML model meets high expectations. Once the information looks good, an exploratory information check is performed to glean instincts. Finally, we created a machine learning model that can predict whether any employee is facing any problem/ difficulties which further results in leaving them. This project uses the Jupyter Python programming notebook to create a machine-learning model. This project used data analytics and machine learning to determine the most important parameters of any motive of leaving

Platform/Coding Language/Frameworks (if using): Python, Google Colab, Python Libraries, ML Libraries

Database/Cloud/ Hosting : Google Cloud

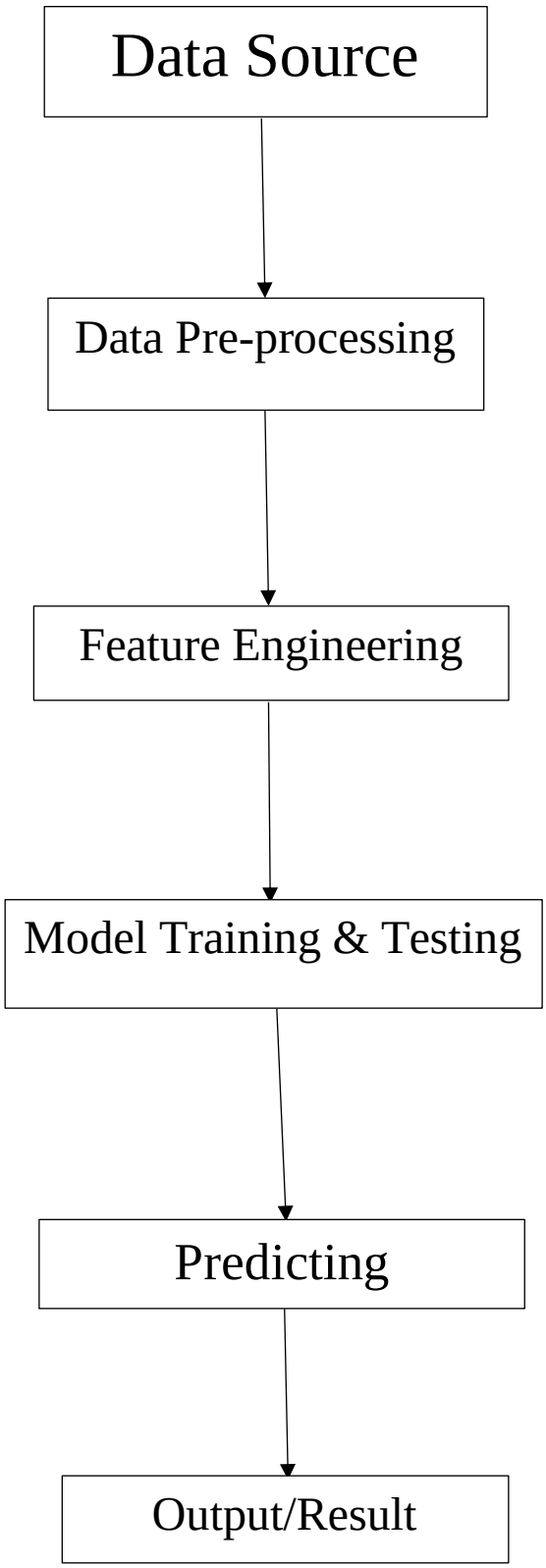
External tools : Kaggle Dataset

Methodology :

1.Define the Problem
2.Gather Data
3.Data Analysis
4.Data Processing
5.Feature Engineering
6.Model Selection
7.Model Training
8.Model Evaluation
9.Deploy & Monitor
10.Maintenance

Feasibility Study :

1. **Technical feasibility** : predicting employee turnover is technically feasible, and there are various tools and techniques available to develop a predictive model. However, the success of the project would also depend on factors such as data availability, data quality, and the ability to integrate the model with existing HR systems.
2. **Economic feasibility** : predicting employee turnover can be economically feasible if the benefits of the project outweigh the costs. However, it is important to carefully consider the costs and benefits and perform a cost-benefit analysis to determine the economic feasibility of the project. It is also important to monitor the project over time to ensure that it continues to provide economic benefits.
3. **Operational Feasibility** : predicting employee turnover can be operationally feasible if the users are willing to adopt the system, the required data is available, the technical expertise is available, and the system can be integrated with existing HR systems. It is also important to provide appropriate training and support and continually evaluate the system's effectiveness and user satisfaction.



Workflow Diagram

Colab Notebooks - Google Drive

colab.research.google.com/drive/1ZdRq0DHsyHWtkqKJjdKS2OleaTiC7dM2

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Employee Turnover Prediction.ipynb

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RAM Disk

```
[ ]  #import data
     from google.colab import files
     uploaded  = files.upload()
```

Choose files No file chosen Upload widget is only available when the cell has been executed in the current browser session. Please rerun this cell to enable.

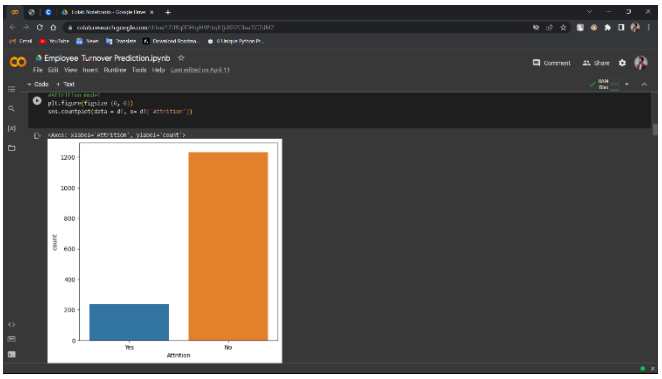
Saving WA_Fn-UseC_-HR-Employee-Attrition.csv to WA_Fn-UseC_-HR-Employee-Attrition.csv

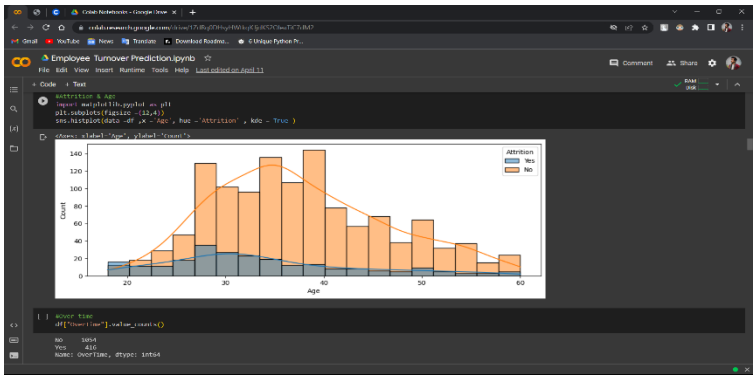
```
[ ]  #store data in data frame
     #First 5 entities
     df = pd.read_csv("WA_Fn-UseC_-HR-Employee-Attrition.csv")

     df.head(5)
```

	Age	Attrition	BusinessTravel	DailyRate	Department	DistanceFromHome	Education	EducationField	EmployeeCount	EmployeeNumber	...	RelationshipSatisfaction	StandardHours	Stoc
0	41	Yes	Travel_Rarely	1102	Sales	1	2	Life Sciences	1	1	...	1	80	
1	49	No	Travel_Frequently	279	Research & Development	8	1	Life Sciences	1	2	...	4	80	
2	37	Yes	Travel_Rarely	1373	Research & Development	2	2	Other	1	4	...	2	80	
3	33	No	Travel_Frequently	1392	Research & Development	3	4	Life Sciences	1	5	...	3	80	
4	27	No	Travel_Rarely	591	Research & Development	2	1	Medical	1	7	...	4	80	

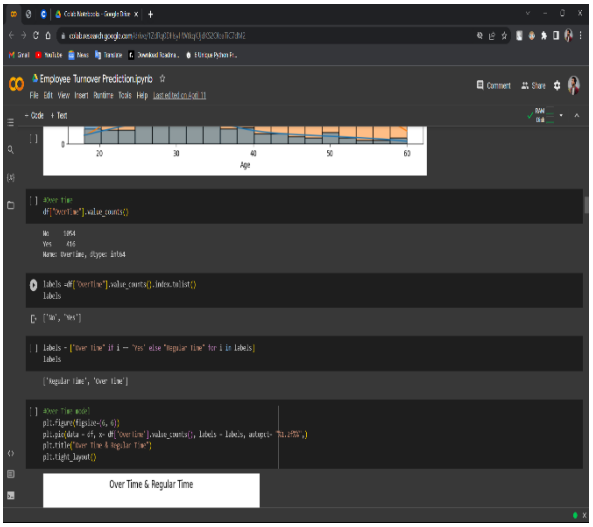
5 rows × 35 columns

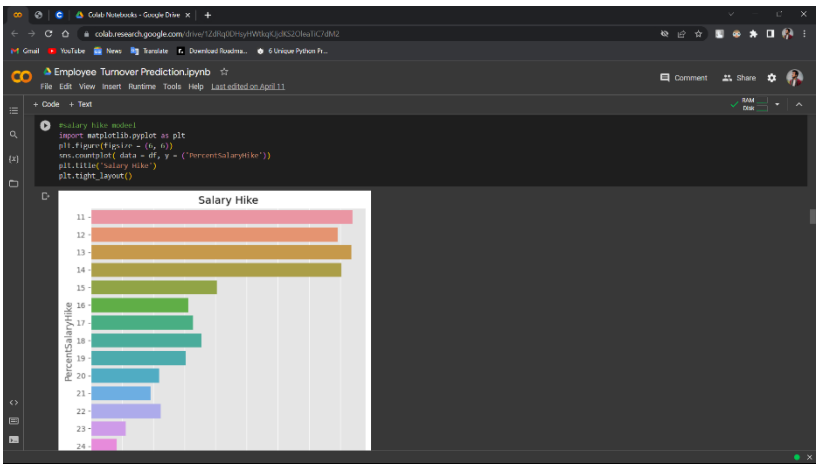
Insertion of dataset. And showing first 5 rows & column

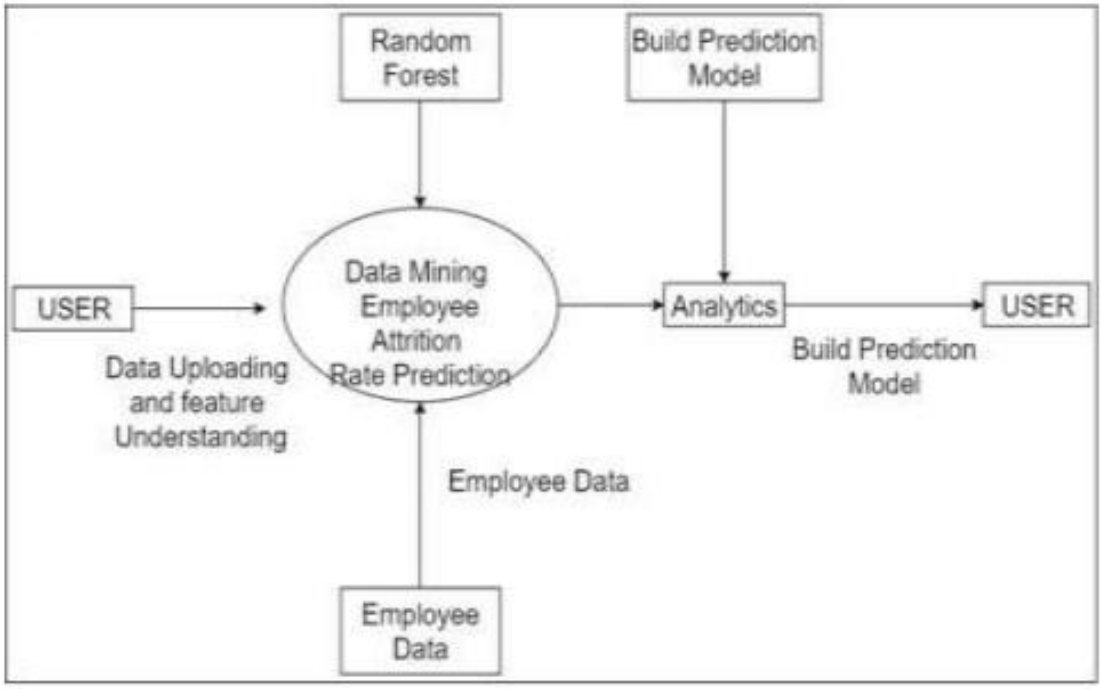




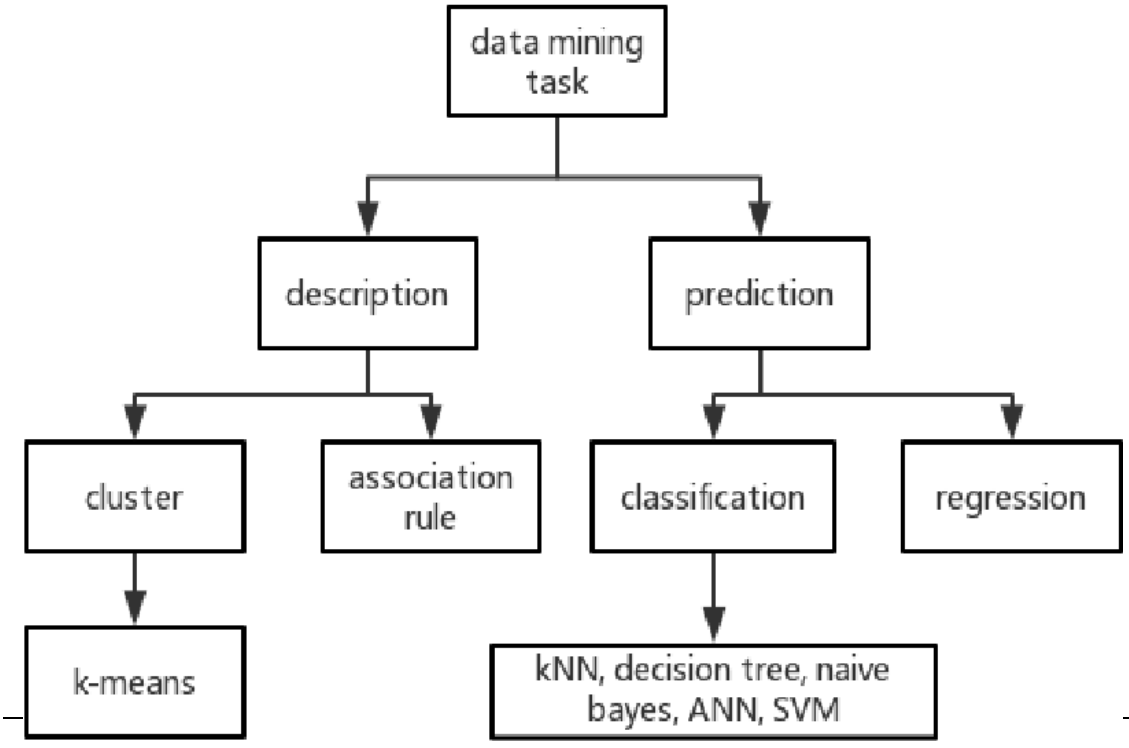
Preparing ML Model







Dataflow Diagram



Decision Tree Diagram

Most challenging aspect of the project statement:

Many researchers have conducted machine learning applications on companies system to get many information.
Researchers have concluded that SVM (support vector machine) and ANN (Artificial Neural Network) performed better than other classifiers. However, it is important to study how these two algorithms behave differently with filter-based feature selection and balancing imbalanced data which is inherited by nature using Synthetic Minority Oversampling Technique (SMART). And most importantly being new in such project and finding proper information was one of the most challenging.

Conclusion

If the project is found to be feasible and economically viable, it can be implemented with appropriate resources and timelines, while also monitoring the system's performance and effectiveness over time. Ultimately, predicting employee turnover can provide organizations with valuable insights into their workforce and help them make data-driven decisions to improve their employee retention rates and overall business performance.