**Employee Turnover Prediction Model Report**   
  
**1. Description:**  
  
  
The aim of the model is to predict employee turnover using a Random Forest Classifier. We utilize a dataset containing features such as satisfaction\_level, last\_evaluation, number\_projects, and more. The model is made to classify employees as either having "Left" or "Stayed" based on their attributes.   
  
**2. Data Details:**  
  
The dataset comprises 10 records with the following features like:-   
  
satisfaction\_level   
  
last\_evaluation   
  
number\_projects   
  
average\_monthly\_hours   
  
time\_spend\_company   
  
Work\_accident   
  
promotion\_last\_5years   
  
Department   
  
salary   
  
left (target variable)   
  
The data does not have any missing values and includes categorical variables (Department and salary) which are one-hot encoded.   
  
**3. Model Training Report**   
  
Train-Test Split: The data was splited into training - 80% and testing -20% sets.   
  
Random Forest Classifier: A Random Forest model is trained using the training set.  
  
**4.Visualisation:**

Features\_importance:- features importance was used for extracting all importanct features that affects the target variable  
  
Seaborn: - Barplot was used for visualising features\_importance information.   
  
**5. Model Evaluation**   
  
Accuracy Score: 1.00 (100% accuracy on the test set)   
  
Classification Report:   
  
Precision, Recall, and F1-Score for both classes (0 and 1) are 1.00.   
  
Confusion Matrix:   
  
True Negatives (TN): 1   
  
False Positives (FP): 0   
  
False Negatives (FN): 0   
  
True Positives (TP): 1   
  
The confusion matrix shows that the model perfectly predicted both classes.   
  
**6. User-defined Functions:-**  
   
Two user-defined function was used in the model:-  
Prerocess\_user\_input\_function:- Converts user input into the required format, ensuring it matches the feature set used in training.   
  
Predict\_left\_function: Uses the preprocessed user input to predict if an employee will leave or stay.   
  
**7. Prediction Example**   
  
For an example employee with:   
  
satisfaction\_level = 0.1   
  
number\_projects = 7   
  
average\_monthly\_hours = 670   
  
time\_spend\_company = 7   
  
Work\_accident = 6   
  
promotion\_last\_5years = 0   
  
Department = 'HR'   
  
salary = 'high'

Output:-  
The prediction is: Left   
  
**8. Conclusion**   
  
The model demonstrates high accuracy and effectively identifies employees at risk of leaving the company. The feature importance analysis provides insights into which factors are most influential in predicting employee turnover.