# EMPLOYEE ATTRITION PREDICTION USING ANN

Machine Learning

# INTRODUCTION

Employee attrition refers to the loss of employees over time.

High attrition increases recruitment cost and affects productivity.

This project uses Artificial Neural Networks (ANN) to predict employee attrition.

# PROBLEM STATEMENT

ORGANIZATIONS STRUGGLE TO IDENTIFY EMPLOYEES LIKELY TO LEAVE.

MANUAL ANALYSIS IS INEFFICIENT AND INACCURATE.

GOAL: BUILD A PREDICTIVE MODEL TO IDENTIFY ATTRITION RISK EARLY.

# PROJECT OBJECTIVES

## Analyze

Analyze employee data.

## Identify

Identify key factors affecting attrition.

## Build

Build an ANN model for prediction.

## Evaluate

Evaluate model performance.

# DATASET OVERVIEW

HR Employee Attrition Dataset.

Contains demographic, job, and performance-related features.

Target variable: Attrition (Yes / No).

# DATA PREPROCESSING

- Handled categorical variables using encoding.
- Feature scaling applied to numerical columns.
- Split data into training and testing sets.

# EXPLORATORY DATA ANALYSIS (EDA)

Analyzed attrition distribution.

Observed trends with age, salary, job role, and experience.

Helped understand patterns before modeling.

# WHY ARTIFICIAL NEURAL NETWORK (ANN)?

Handles complex non-linear relationships.

Performs well with large feature sets.

Mimics human learning process.

# ANN MODEL ARCHITECTURE

INPUT LAYER WITH EMPLOYEE FEATURES.

MULTIPLE HIDDEN LAYERS WITH RELU ACTIVATION.

OUTPUT LAYER WITH SIGMOID ACTIVATION FOR BINARY CLASSIFICATION.

# MODEL TRAINING

Loss function: Binary Cross-Entropy.

Optimizer: Adam.

Model trained for multiple epochs to reduce loss.

# MODEL EVALUATION

Accuracy used as primary metric.

Compared training and testing performance.

Checked for overfitting and underfitting.

# RESULTS

ANN model achieved good prediction accuracy.

Successfully identified employees with higher attrition risk.

Model can assist HR decision-making.

# BUSINESS IMPACT

Helps HR take preventive actions.

Reduces hiring and training costs.

Improves employee retention strategy.

# LIMITATIONS

1. Model depends on historical data quality.
2. External factors not included.
3. Performance can improve with more data.

# CONCLUSION

ANN IS EFFECTIVE FOR PREDICTING EMPLOYEE ATTRITION.

EARLY PREDICTION SUPPORTS BETTER HR PLANNING.

FUTURE WORK CAN INCLUDE ADVANCED DEEP LEARNING MODELS.