

# Hope Artificial Intelligence

## Scenario Based Learning

A company works with number of employees, all the works are dependents on the employees. Even if one of the employees resign the job immediately then assigned work will be not finished at the time, so delivery of the project to the clients will be delayed. Company planned to make solution for this, they want to know which employee may resign next. If they know previously, they can arrange alternative to avoid such problem. As an AI Engineer you must give Solution to this.

- A) How will you achieve this in AI?
- B) Find out the 3 -Stage of Problem Identification
- C) Name the project
- D) Create the dummy Dataset.

## Solution to Predict Employee Attrition

### A) How will you achieve this in AI?

To predict which employee may resign next, we can build an **AI-based Employee Attrition Prediction System** using the following steps:

1. **Data Collection:** Gather historical employee data (e.g., job role, salary, tenure, performance ratings, job satisfaction, promotion history, workload, etc.).
2. **Data Preprocessing:** Clean data, handle missing values, and encode categorical variables.
3. **Feature Engineering:** Extract meaningful features (e.g., overtime frequency, recent complaints, missed promotions).
4. **Model Selection:** Train a **classification model** (e.g., Logistic Regression, Random Forest, XGBoost, or Neural Networks) to predict attrition risk.
5. **Model Evaluation:** Use metrics like **Precision, Recall, F1-Score, and AUC-ROC** to assess performance.
6. **Deployment:** Integrate the model into HR systems to flag high-risk employees in real-time.
7. **Explainability:** Use SHAP/LIME to interpret why an employee is flagged (e.g., low salary, high stress).

### Tools/Frameworks:

- Python (Scikit-learn, TensorFlow/PyTorch)
- Power BI/Tableau for HR dashboards

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### B) 3-Stage Problem Identification

1. **Problem Recognition**
    - Identifying that unexpected resignations delay project deliveries.
  2. **Root Cause Analysis**
    - Analyzing past resignations to find patterns (e.g., burnout, low pay, lack of growth).
  3. **Solution Formulation**
    - Building an AI system to predict resignations proactively.
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### C) Name the Project

**"SmartRetain: AI-Powered Employee Attrition Prediction System"**

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### D) Dummy Dataset Example

Employee ID	Age	Salary	Tenure (Years)	JobSatisfaction (1-10)	Overtime (Hours/Week)	PromotionLastYear	Resigned (Target)
101	32	65000	3	7	5	0	0
102	28	48000	1	4	12	0	1
103	45	85000	8	9	2	1	0
104	36	72000	5	5	8	0	1
105	29	55000	2	6	10	0	1

#### Features Explanation:

- **JobSatisfaction:** Self-rated (1-10 scale)
- **Overtime:** High overtime may indicate burnout.

- **PromotionLastYear:** 1 = Promoted, 0 = Not Promoted.
- **Resigned (Target):** 1 = Left, 0 = Stayed.

This dataset can be expanded with more features like **department, training hours, distance from home, etc.**