**Problem Identification Assignments**

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.

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

To predict employee resignations, we can use a **Machine Learning (ML) model** and **NLP** model.

The steps are:

1. **Data Collection:**
   * Gather historical employee data, such as tenure, performance ratings, department, job role, salary changes, training history, workload, and any past resignations.
   * Include external factors like market conditions or employee satisfaction surveys.
2. **Feature Engineering:**
   * Identify key indicators influencing resignations,
     + Job satisfaction
     + Number of promotions
     + Absenteeism
     + Workload
     + Peer resignations
3. **Model Selection:**
   * Choose a classification model, such as:
     + Logistic Regression – workload - small dataset - Simple, linear relationships
     + Random Forest - Medium dataset - relationships are non-linear or complex
     + Gradient Boosting (e.g., XGBoost) - Low interpretability and High accuracy
     + Neural Networks (for large datasets) - dataset has thousands of features and millions of records
4. **Training the Model:**
   * Split data into training and testing sets.
   * Train the model on historical data where the target variable is **resigned or not resigned**.
5. **Prediction & Insights:**
   * Use the trained model to predict which employees are at risk of resigning.
   * Provide actionable insights for HR to intervene, such as offering promotions, salary adjustments, or training opportunities.

**B) Find out the 3 -Stage of Problem Identification**

Stage -1 – NLP and ML 🡪 Input is Number and Text both

Stage -2 – Supervised 🡪 We know Input (get from source of employee details) and expected output.

Stage -3 – Classification 🡪 Classify the output based on the input.

**C) Name the project**

Carrier Shift clock

**D) Create the dummy Dataset.**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **EmployeeID** | **Age** | **Tenure (Years)** | **Job Role** | **Department** | **Salary** | **Performance Rating** | **Training Hours** | **Workload Index** | **Attrition (Yes/No)** |
| 101 | 29 | 3 | Developer | IT | 60000 | 4.5 | 20 | 75 | No |
| 102 | 35 | 5 | Manager | HR | 80000 | 4.2 | 10 | 50 | Yes |
| 103 | 40 | 7 | Analyst | Finance | 70000 | 4.8 | 15 | 60 | No |