**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 address this Scenario using AI, I would recommend implementing a predictive model to estimate the likelihood of employee turnover. This can be achieved through the use of machine learning algorithms that can analyze historical employee data and identify patterns or factors that contribute to employee resignation.

One approach would be to use a supervised learning algorithm **logistic regression, decision trees, random forests t**he probability of an employee resigning. The model would be trained on a dataset of past employee records, including features

Demographic information includes age, gender, marital status, Job-related factors like job role, department, salary, performance ratings Behavioral indicators such as absenteeism, tardiness, training participation Organizational factors includes employee satisfaction, work-life balance, management quality. The model would then be used to analyze the current employee data and generate a risk score or probability for each employee, indicating the likelihood of them resigning in the near future. This information can be used by the company to proactively address potential turnover and implement retention strategies for high-risk employees.

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

**Data Collection and Preparation**:

* Gather historical employee data, including information about past resignations and the factors that may have contributed to them.
* Clean and preprocess the data, handling missing values, encoding categorical variables, and ensuring data quality.
* Split the data into training and testing sets to evaluate the model's performance.

**Model Development and Training**:

* Select an appropriate machine learning algorithm, such as logistic regression or decision trees, based on the nature of the problem and the available data.
* Train the model on the historical employee data, tuning the hyperparameters to optimize its performance.
* Evaluate the model's accuracy, precision, recall, and F1-score on the testing set to ensure its reliability.

**Model Deployment and Monitoring**:

* Integrate the trained model into the company's systems to generate real-time predictions for current employees.
* Monitor the model's performance and update it periodically as new employee data becomes available, to ensure the predictions remain accurate over time.
* Develop a system to proactively notify the HR department about high-risk employees, allowing them to take appropriate action.

**C) Name the project:**

**"PREDICTIVE EMPLOYEE RETENTION ANALYTICS".**

**D) CREATE THE DUMMY DATASET:**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **EID** | **AGE** | **GENDER** | **TENURE** | **DEPT** | **SALARY** | **ABS** | **SATISFACTION** | **RESIGNED** |
| 1001 | 32 | Female | 4 | Marketing | 65000 | 4 | 3 | 0 |
| 1002 | 29 | Male | 2 | IT | 75000 | 5 | 1 | 1 |
| 1003 | 45 | Female | 8 | HR | 85000 | 3 | 5 | 0 |
| 1004 | 27 | Male | 1 | Sales | 55000 | 3 | 2 | 0 |
| 1005 | 38 | Female | 6 | Marketing | 70000 | 4 | 2 | 0 |
| 1006 | 31 | Male | 3 | IT | 80000 | 4 | 1 | 1 |
| 1007 | 41 | Female | 7 | HR | 90000 | 4 | 3 | 0 |
| 1008 | 25 | Male | 1 | Sales | 60000 | 3 | 4 | 0 |
| 1009 | 35 | Female | 5 | Marketing | 75000 | 4 | 2 | 0 |
| 1010 | 28 | Male | 2 | IT | 70000 | 4 | 1 | 1 |