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?

We can achieve this using a classification machine learning model. Here's the general process:

Data Collection: Gather historical data about employees, including those who have resigned and those who haven't. This data will be our training ground.

Feature Engineering: Identify relevant features (employee characteristics and behaviors) that might influence an employee's decision to resign.

Model Selection: Choose an appropriate classification algorithm.

Model Training: Train the chosen model on the historical data to learn the patterns associated with resignations.

Model Evaluation: Evaluate the model's performance on unseen data to ensure it generalizes well.

Prediction: Use the trained model on current employee data to predict the probability of resignation for each employee in the coming months.

Monitoring and Retraining: Continuously monitor the model's performance and retrain it with new data to maintain accuracy.

B) Find out the 3 -Stage of Problem Identification

Model selection,Stage1: Given that our goal is to predict a specific outcome (whether an employee will resign or not), this naturally leans towards Machine Learning (ML) models. While Deep Learning (DL) models can be powerful, they typically used for image processing and require very large datasets to learn complex patterns effectively. For an initial implementation and with potentially limited historical resignation data, traditional ML algorithms are often more efficient and interpretable.

Learning Method, Stage2: The problem of predicting whether an employee will resign or not is a supervised learning task. Here's why:

We have a target variable: Our dummy dataset (and any real-world dataset for this problem) includes the IsResigned column. This is the "ground truth" that our model will learn from.

We have labeled data: Each employee record in our historical data is "labeled" with whether they eventually resigned ("Yes") or not ("No").

The goal is prediction: We want to train a model to predict this label for new, unseen employee data.

Classification or Regression, Stage3: Predicting whether an employee will resign ("Yes" or "No") is a classification problem.

C) Name the project

1) Employee Attrition Prediction System

2) Resignation Risk Forecaster

D) Create the dummy Dataset.

Here's a simplified dummy dataset you can use as a starting point. Remember that a real-world dataset would likely have many more features and a larger number of records.

Below are the columns in our dataset:-

EmployeeID: Unique identifier for each employee.

Age: Age of the employee.

Gender: Gender of the employee.

Tenure(Years): Number of years the employee has worked at the company.

Department: Department the employee belongs to.

JobSatisfaction(1-5): Self-reported job satisfaction level (1 being lowest, 5 being highest).

EngagementScore(1-5): A measure of employee engagement (1 being lowest, 5 being highest).

TrainingCompleted: Whether the employee has completed required training (Yes/No).

PromotionsLast2Years: Number of promotions received in the last two years.

SalaryHikeLastYear(%): Percentage increase in salary in the last year.

AbsenteeismDaysLastYear: Number of days the employee was absent last year.

PerformanceRating(1-5): Employee's performance rating (1 being lowest, 5 being highest).

IsResigned: Target variable indicating whether the employee has resigned (Yes/No).

Dummy Dataset:

EmployeeID,Age,Gender,Tenure(Years),Department,JobSatisfaction(1-5),EngagementScore(1-5),TrainingCompleted,PromotionsLast2Years,SalaryHikeLastYear(%),AbsenteeismDaysLastYear,PerformanceRating(1-5),IsResigned

1,32,Male,3,Sales,4,3,Yes,0,5,2,4,No

2,28,Female,1,Marketing,2,2,No,0,0,5,3,Yes

3,35,Female,5,HR,5,4,Yes,1,8,1,5,No

4,40,Male,7,Engineering,3,3,Yes,0,3,0,4,No

5,25,Male,0.5,Sales,1,1,No,0,0,10,2,Yes

6,38,Female,4,Marketing,4,5,Yes,0,6,3,4,No

7,30,Male,2,Engineering,5,4,No,0,2,1,5,No

8,27,Female,1.5,HR,3,2,No,0,1,7,3,Yes

9,42,Male,6,Sales,2,3,Yes,1,10,0,4,No

10,29,Female,2.5,Marketing,5,5,Yes,0,4,2,5,No

11,31,Male,3.5,Engineering,4,4,No,0,1,4,4,No

12,26,Female,0.8,HR,2,1,No,0,0,9,2,Yes

13,37,Male,5.2,Sales,3,2,Yes,0,7,1,3,No

14,33,Female,2.1,Marketing,4,3,No,1,3,0,5,No

15,24,Male,0.3,Engineering,1,1,No,0,0,12,1,Yes

16,39,Female,4.8,HR,5,5,Yes,0,9,2,5,No

17,31,Male,2.9,Sales,3,4,No,0,2,3,4,No

18,28,Female,1.2,Marketing,2,2,No,0,0,6,3,Yes

19,36,Male,6.1,Engineering,4,3,Yes,1,5,0,4,No

20,25,Female,0.7,HR,1,1,No,0,0,11,2,Yes

Therefore, to summarize:

Model: Machine Learning (ML) models.

Learning Method: Supervised Learning.

Type of Problem: Classification.

So, as an AI Engineer, I would focus on building a supervised classification model using machine learning algorithms to predict the likelihood of employee resignation.