PYTHON & DATA ANALYTICS - CASE STUDIES

Dyashin Technosoft Development Team

1. Employee Data Analysis

Objective: Perform exploratory analysis on Dyashin's employee dataset to gain HR insights.

Instructions:

- Clean and preprocess the dataset.
- Analyze gender distribution, department size, average salaries by department/location.
- Identify trends in joining dates and tenure.
- Visualize salary trends by designation and department.
- Optional: Predict attrition based on salary, role, and location (if a label exists).

2. LMS Usage Analytics (DSEdify)

Objective: Analyze user engagement with DSEdify LMS modules.

Instructions:

- Analyze most popular Course.
- Find average time spent per course.
- Identify user drop-off points and completion rates.
- Highlight courses where learners spend the most and least time.
- Identify top-performing courses based on number of completions.
- Calculate course-wise CompletionStatus percentages.
- Create time-series plots showing trends in course access over months.
- Use bar charts and pie charts to depict completion distribution and device usage

3. Predictive Hiring Analysis

Objective: Predict the likelihood of a candidate being selected and retained.

Instructions:

- Clean and preprocess candidate data.
- Perform EDA to understand relationships between test scores and hiring.
- Visualize hiring patterns by experience level and education.
- Build a binary classification model (Logistic Regression or Decision Tree).
- Evaluate model using accuracy, precision, recall, and confusion matrix.

4. IT Asset Maintenance Forecasting

Objective: Forecast maintenance needs for IT assets.

Instructions:

- Analyze distribution of asset types and their service history.
- Calculate average time between services.
- Visualize assets nearing maintenance dates.
- Optional: Predict future maintenance schedule using regression models.

5. Skill Gap Analysis

Objective: Identify gaps between current and required skills across employees.

Instructions:

- Compare current and required proficiency for each skill.
- Visualize top 5 skills with the largest gaps.
- Suggest training areas based on analysis.
- Optional: Cluster employees based on skill profiles.

6. Web Traffic Analysis

Objective: Analyze traffic patterns on Dyashin's LMS platform.

Instructions:

- Ensure SessionDurationSeconds and BounceRate are in valid numerical formats.
- Analyze average SessionDurationSeconds by Device.
- Analyze session duration by page type and browser
- Correlate session duration with PageViews and BounceRate
- Identify which devices are associated with longer or shorter session durations.
- Use bar or line charts to visualize device-wise average session duration.
- Create histograms or scatter plots for bounce rate vs. session duration.