**High Impact Skills Development Program**

**in Artificial Intelligence, Data Science, and Blockchain**

**Module 3: Data Visualization**

**Module Project**

Interactive Dashboard Development

Using Tableau for Exploratory Data Analysis (EDA)

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# Objective:

In this project, you will perform Exploratory Data Analysis (EDA) using Tableau, which is a crucial step before any AI or machine learning task. EDA helps you understand the underlying patterns, distributions, and relationships within your data, setting the stage for more sophisticated analysis. By engaging deeply with the data through Tableau, you will practice making informed decisions that not only improve the effectiveness of your visualizations but also lay a solid groundwork for future predictive modeling or machine learning applications. You will select a substantial dataset of your choice and develop an interactive dashboard that uncovers and presents meaningful insights.

The dataset should include around 1,000 items (rows) and 10 attributes (columns). Your final submission will include a Tableau Public link to your dashboard and a concise report detailing your EDA process, design decisions, and any challenges encountered.

# Dataset Selection:

* Choose a dataset that interests you and is relevant to your field of study or work.
* The dataset must have at least 1,000 items (row) and 8 variables (columns), offering a rich context for exploration.
* Possible sources include Kaggle, Data.gov, and other open data platforms.
* Ensure that the dataset is clean or perform the necessary preprocessing before uploading it to Tableau.

# Interactive Dashboard:

* Visualization Design:
  + Your task is to create a series of visualizations (at least 4) that effectively communicate key insights from your dataset.
  + Use various chart types (e.g., bar charts, line charts, scatter plots, heatmaps, box plot) that are best suited for the data based on the theory discussed in the class.
  + The goal is to explore the data comprehensively, revealing patterns, trends, and anomalies.
* Interactivity and User Experience:
  + Enhance the EDA process by incorporating interactive elements such as filters, parameters, and tooltips.
  + This interactivity allows users to dynamically explore different aspects of the data, deepening their understanding.
* Creativity and Innovation:
  + Leverage advanced Tableau features such as calculated fields, level of detail (LOD) expressions, or story points to enrich your EDA.
  + Think creatively about how to visualize the data to discover hidden insights and tell a compelling data story.

# Submission:

* Tableau Public Link:
  + Publish your EDA dashboard to Tableau Public and provide a shareable link.
  + Ensure your dashboard is publicly accessible and the privacy settings are configured correctly.
* Report (approximately 2-3 pages) that includes:
  + **Introduction**: Describe the dataset and the objectives of your EDA, explaining how the insights gained will support future AI/ML tasks.
  + **Visualization Process**: Detail the steps you took to create each visualization, including the rationale for choosing specific chart types and how they contribute to the overall exploratory analysis.
  + **Decision-Making Justification**: Discuss your design choices, focusing on how they enhance the clarity, aesthetics, and interactivity of your EDA dashboard.
  + **Challenges and Solutions**: Reflect on any challenges encountered during the project and how you overcame them.
  + **Conclusion**: Summarize the key insights derived from your EDA and explain how they will inform and influence subsequent AI/ML tasks.

# Evaluation Criteria:

* Visualization Design (30%):
  + The effectiveness of your visualizations in revealing insights during EDA.
  + Clarity, aesthetics, and the appropriateness of chart types for exploratory analysis.
  + Justification of design choices in the report.
* Interactivity and User Experience (30%):
  + The degree to which your dashboard facilitates interactive exploration of the data.
  + Ease of navigation and the ability to uncover insights through interaction.
  + Enhancements to user experience that support a thorough EDA process.
* Creativity and Innovation (20%):
  + Originality in the use of Tableau features to enhance EDA.
  + Creative approaches to uncovering and presenting data insights.
  + Incorporation of storytelling techniques that add depth to the EDA.
* Documentation and Reporting (20%):
  + Clarity and depth of the accompanying report.
  + Detailed explanation of the EDA process, including challenges and design rationale.
  + Demonstration of a comprehensive understanding of the dataset and strategic exploration.