# **HVA24: Mini Hackathon 2.0 - Electric Vehicle (EV) Market Analysis**

## Rules

* The Mini Hackathon is an individual event, and **external help, including tools like ChatGPT, is NOT allowed**. Please refrain from discussing or collaborating with others. Strict action will be taken if anyone is found using external tools or collaborating.
* The goal is to challenge yourself in Data Processing, Data Analysis, and Data Visualization. The objective is to test your own skills and abilities.
* If you feel that you need more time to fully grasp the concepts required for this Mini Hackathon, you can **request an extension**. Extensions must be requested from the submission form **before the original deadline**.
* The event starts now, and submissions are due before Monday, 14th October 2024, at 10 AM.

## Problem Statement

### Overview:

In this Data Science challenge, participants will explore a [dataset from Kaggle](https://www.kaggle.com/datasets/srinrealyf/india-ev-market-data) featuring India's electric vehicle (EV) market data. This challenge focuses on utilizing your skills in **Pandas for Data Processing and Analysis** and **Power BI for Visualization** to extract meaningful insights from the dataset.

### Task:

Your task is to explore the India EV Market dataset and uncover valuable insights about the electric vehicle industry.

### Suggested Areas for Analysis:

* **EV Adoption Trends:** Analyze the adoption rate of electric vehicles over the years. How has the demand for EVs changed over time?
* **Manufacturer Performance:** Compare the performance of different EV manufacturers. Which companies have the highest market share, and what factors contribute to their success?
* **Price vs. Features:** Investigate the relationship between the price of EVs and their features. Is there a correlation between price and key attributes such as battery life, range, or charging time?
* **Impact of Government Policies:** Explore the impact of government subsidies or regulations on the EV market. Have policy changes resulted in noticeable shifts in sales or adoption rates?
* **Geographical Analysis:** Study how the demand for electric vehicles varies across different regions in India. Which regions are leading in EV adoption, and what might be the reasons behind this trend?
* **Environmental Impact:** Analyze the potential environmental benefits of increasing EV adoption. What is the reduction in emissions or fuel consumption?

These are suggested areas for analysis. Feel free to explore other aspects of the data that you find interesting or relevant.

### Tools to Use:

* **Data Processing and Analysis:** Focus on using Pandas for data manipulation and analysis.
* **Visualization:** Use Power BI to create compelling visualizations that effectively communicate your findings.

### Scoring

Your project will be evaluated based on the following key areas. Please ensure these aspects are well addressed in your submission:

* Data Cleaning and Pre-processing:
  + Handling missing data
  + Outlier detection and treatment
  + Feature engineering and transformation
* Descriptive Statistics and Data Summary:
  + Providing basic statistical summaries
  + Drawing initial insights from the data
* Data Visualization:
  + Using appropriate and effective visuals
  + Ensuring clarity and interpretability in visualizations
* Conclusions and Next Steps:
  + Summarizing key findings from your analysis
  + Proposing meaningful next steps or recommendations
* Technical Excellence:
  + Writing clean, organized, and well-documented code
  + Applying advanced techniques or deriving deeper insights beyond basic analysis
  + Delivering a well-explained Loom video demonstrating your project workflow and findings

## Submission

If you're unable to finish everything on time, you can request an extension. Please make sure to request the extension before the original deadline.

Submit the following via the provided [Google Form](https://forms.gle/Fcq3KPX59oyrDVpd6):

* Github Link: A link to your GitHub repository containing all your Pandas scripts and Power BI files.
* Loom video:
  + Demonstrating the workflow of your project.
  + Explaining your analysis and visualizations.

**Note:** If 5 minutes are insufficient to explain your project, make 2 videos.

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