Feature Extraction and Price Prediction for Mobile Phones

Project Scenario:

You work for a prominent organization that specializes in selling mobile phones. The organization is keen to enhance its pricing strategy by gaining a deeper understanding of the key features that influence the prices of mobile phones in today's highly competitive market. Your objective is to build a predictive model that can accurately estimate the price of a mobile phone based on its features. To achieve this, you'll perform a feature extraction analysis to identify the most influential features.

Project Description:

In this project, you will work with a dataset that contains detailed information about various mobile phones, including their model, color, memory, RAM, battery capacity, rear camera specifications, front camera specifications, presence of AI lens, mobile height, processor, and, most importantly, the price. Your primary goal is to develop a predictive model for mobile phone prices.

Project Tasks:

Data Exploration:

Begin by loading and exploring the dataset to understand its structure, data types, and the range of values for each feature. You can find the data [here](#).

Data Preprocessing:

Handle any missing values, outliers, or inconsistencies in the dataset.
Convert categorical variables (e.g., model, colour) into a suitable numerical format, such as one-hot encoding.

Feature Extraction:

Perform feature extraction to identify the most relevant features that strongly affect the price of mobile phones.
Use statistical methods, visualizations, or feature importance techniques (e.g., correlation analysis, feature selection, or dimensionality reduction) to narrow down the list of important features.

Model Building:

Split the dataset into training and testing sets.
Develop a machine learning model for price prediction. You can choose algorithms like linear regression, decision trees, or more advanced models like random forests or gradient boosting.

Model Evaluation:

Evaluate the model's performance using appropriate metrics (e.g., mean absolute error, root mean squared error) to assess how accurately it predicts mobile phone prices.

Feature Importance Analysis:

Analyze the feature importances obtained from your model to confirm the significance of the features identified during the feature extraction phase.

Report and Visualization:

Create a comprehensive report or presentation that summarizes the project's findings.
Include visualizations and insights related to feature importance and their impact on price prediction.

Recommendations:

Provide recommendations to the organization regarding which features have the most significant influence on mobile phone prices. This information can inform pricing strategies and marketing decisions.

Deliverables:

- A project report or presentation that details the entire process, from data exploration to feature extraction and model building.
- All code and scripts used in the project.
- Visualizations and insights related to feature importance.
- Recommendations for the organization based on the project's findings.

Additional Notes:

You can use data science and machine learning libraries such as scikit-learn (for Python) for building and evaluating your predictive model.
Ensure that your project is well-documented, and your findings are clearly explained, especially with regard to the influential features affecting mobile phone prices.

Links
[Feature Extraction Techniques](#)
[What is feature extraction](#)
[Machine Learning Feature Extraction Techniques](#)
[Encoding Techniques](#)

Deadline: 15th August, 2025