**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.

Data Exploration:

Begin by loading and exploring the dataset to understand its structure, data types, and the range of values for each feature.

Data Preprocessing:

Handle any missing values, outliers, or inconsistencies in the dataset.

Convert categorical variables (e.g., model, color) 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 importance 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.

Python Libraries Used - Data science libraries such as Numpy, Pandas, Matplotlib, Seaborn and Machine learning libraries such as Sk-learn (for Python) for building and evaluating the predictive model in the Jupyter Notebook Environment.