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* **DEPARTMENT:**

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* **SUBJECT:**

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**Project Report:**

**Mobile Price Prediction using Machine Learning Algorithms**

1. **Introduction**

In today's digital age, mobile phones are an integral part of our lives. The mobile market is highly competitive, with numerous brands and models available. Predicting the price of mobile phones based on various features can be a valuable tool for consumers and manufacturers alike. This project aims to develop a machine learning model that predicts mobile prices based on several parameters.

**2. Objective**

The primary objective of this project is to create a predictive model that accurately estimates the prices of mobile phones using machine learning algorithms. The model will utilize various features such as brand, RAM, internal storage, camera quality, battery capacity, and more.

**3. Dataset**

The dataset for this project consists of various mobile phone specifications and their corresponding prices. The data includes features such as:

Brand

Model

RAM (in GB)

Internal Storage (in GB)

Camera Quality (in MP)

Battery Capacity (in mAh)

Operating System

Display Size (in inches)

Connectivity Options

1. **Methodology**

**4.1 Data Preprocessing**

Data Cleaning: Remove any missing or irrelevant data points.

Feature Encoding: Convert categorical variables into numerical values using techniques like one-hot encoding.

Normalization: Scale the numerical features to ensure that all variables contribute equally to the model.

**4.2 Model Selection**

Different machine learning algorithms will be tested to find the best model for price prediction. The following algorithms may be considered:

Linear Regression

Decision Trees

Random Forest

Support Vector Machines (SVM)

Gradient Boosting

**4.3 Model Training and Evaluation**

Train-Test Split: Divide the dataset into training and testing sets (e.g., 80% training, 20% testing).

Model Training: Train the selected models on the training dataset.

Model Evaluation: Evaluate the models using metrics such as Mean Absolute Error (MAE), Mean Squared Error (MSE), and R-squared.

**5. Results**

The results section will include:

Comparison of different models based on evaluation metrics.

Visualization of predicted prices vs. actual prices.

Analysis of feature importance to understand which features contribute most to price prediction.

**6. Conclusion**

The project aims to provide a reliable mobile price prediction model that can assist consumers in making informed purchasing decisions. The findings will also be beneficial for manufacturers to understand market trends and pricing strategies.

**7. Future Work**

Future enhancements may include:

Incorporating more features such as user ratings and reviews.

Implementing advanced algorithms like deep learning for improved accuracy.

Developing a web application for users to input specifications and receive price predictions.

8. References

Machine Learning textbooks and online resources.

Research papers on price prediction and machine learning algorithms.

Documentation for libraries used (e.g., Pandas, Scikit-learn, Matplotlib).