Mobile Price Prediction Project

## Project Overview

This project implements a machine learning model that automatically predicts mobile phone prices based on device specifications including brand, processor, RAM, and storage capacity. The application features a full-stack implementation with a responsive frontend and Flask backend that serves the trained ML model.

**Architecture**

### Frontend

* **Technologies**: HTML, CSS
* **Features**:
  + User-friendly interface for inputting mobile specifications
  + Responsive design for cross-device compatibility
  + Display of predicted mobile price based on model output

### Backend

* **Framework**: Flask (Python)
* **Responsibilities**:
  + API endpoint handling
  + Data preprocessing
  + Model integration
  + Response formatting

### Machine Learning Model

* **Implementation**: Trained model (algorithm specifics not provided)
* **Input Parameters**:
  + Brand (categorical)
  + Processor (categorical)
  + RAM (numerical, in GB)
  + Storage (numerical, in GB)
* **Output**: Predicted mobile price

### Implementation Details

**Data Flow**

1. User enters mobile specifications through the frontend interface
2. Frontend sends data to Flask backend via form submission
3. Backend preprocesses the data (encoding categorical variables, scaling, etc.)
4. Preprocessed data is fed into the trained ML model
5. Model generates price prediction
6. Backend formats the prediction and sends response
7. Frontend displays the predicted price to the user

### Key Components

**Frontend Components**

* Input form for mobile specifications
* Results display area

**Backend Components**

* Flask routes for handling form submissions
* Data preprocessing utilities
* Model loading and prediction module

### Deployment

The application can be deployed on any web server that supports Python applications. The Flask backend can be deployed using WSGI servers like Gunicorn or uWSGI.

**Future Enhancements**

* Add more input parameters for improved prediction accuracy
* Implement user authentication for personalized experiences
* Add historical prediction tracking
* Expand model to include more mobile brands and features
* Implement a feedback mechanism to improve model accuracy over time

### Conclusion

This mobile price prediction project demonstrates the practical application of machine learning in e-commerce and consumer electronics domains. By combining frontend technologies with Flask and machine learning, the application provides users with instant price predictions based on device specifications, helping them make informed purchasing decisions.