FUTURE PARTS COST PREDICTOR

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Why Need to Predict Cost of Components?

Predicting Vehicle Parts Costs Using Neural Networks

Introduction

- **Objective**: To predict future supplier costs for vehicle parts using historic data and key features.
- **Challenges**:
  - Accurate and fast cost predictions
  - Dealing with missing feature values
  - Maintaining prediction explainability

Dataset Overview

- **Variables**:
  - Total_Mass
  - Painted_Body_Colour
  - Painted_Gloss_Black
  - Grained_Plastic
  - Job_1_Date (Year)
  - Country_of_Production
  - Vehicle_Volume
  - Number_of_Parts_within_Construction
  - Total_Cost

Data Processing

- **Calculation of Unit Costs**:
  - `Total_Mass_per_kg`
  - `Painted_Body_Colour_per_kg`
  - `Painted_Gloss_Black_per_kg`
  - `Grained_Plastic_per_kg`
- **Handling Missing Values**: Replacement with zeros for divisions by zero.
- **Categorical Data Conversion**: Using one-hot encoding for `Country_of_Production`.

Data Splitting and Scaling

- **Data Split**: Training and testing sets split with an 80-20 ratio.
- **Feature Scaling**: StandardScaler used for both features and target variables.

Neural Network Model

- **Model Architecture**:
  - Input Layer: Features
  - Hidden Layers: 64, 32, and 16 neurons with ReLU activation
  - Output Layer: Linear activation for cost predictions
- **Model Compilation**: Optimizer as Adam and loss as Mean Squared Error.

Model Training

- **Training Process**:
  - 100 epochs
  - Batch size of 10
  - Validation split of 20%
- **Evaluation Metric**: Loss on test data

Predictions for New Car Models

- **Input Features for New Models**: Total Mass, Painted Body Colour, Painted Gloss Black, Grained Plastic, Job 1 Date, Country of Production, Vehicle Volume, Number of Parts.
- **Predicted Costs per kg**: Show the predicted unit costs for each part.
- **Total Cost Calculation**: Method to compute total cost from predicted unit costs

	Predict 1	Predicted 1	Predict 2	Predicted 2
Total Mass	1.70	18.708494	1.50	14.031092
Painted Body Colour	0.10	138.00943	0.19	63.58525
Painted Gloss Black	0.10	232.72104	0	199.97932
Grained plastic	0	2.1095822	0	4.6391373
Job 1 Date	2028		2028	
Country of production	UK		UK	
Vehicle Volume	40000		60000	
Number of parts within construction	3		2	

Total-68.87748   33.12783

THANK YOU!

Any Questions?