Graphic Card Price in Daraz Online Shopping

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**ABSTRACT:**

The study investigates the pricing trends of graphics cards on Daraz, an online shopping platform, using data analytics and machine learning techniques. Graphics cards have become an essential component for gaming, professional graphics work, and cryptocurrency mining, leading to fluctuating market prices driven by demand and supply dynamics. This research aims to predict the prices of graphics cards based on historical data and various product attributes. We compiled a dataset from Daraz, including information such as brand, model, specifications, and prices. By applying machine learning algorithms, we developed a model capable of accurately forecasting the price range of different graphics cards. The findings provide valuable insights for consumers and sellers, helping them make informed decisions in a volatile market. This study not only underscores the significance of data-driven approaches in e-commerce but also highlights the practical applications of predictive modeling in understanding market trends.

**INTRODUCTION:**

Graphics cards, or GPUs (Graphics Processing Units), are crucial for various applications, ranging from gaming and professional graphics design to scientific computing and cryptocurrency mining. The demand for GPUs has surged in recent years, causing significant fluctuations in their prices. Daraz, a leading online marketplace, offers a diverse range of graphics cards, making it a valuable source of data for analyzing price trends and market dynamics. The availability of extensive data on Daraz provides an opportunity to apply machine learning techniques to predict graphics card prices. This introduction explores the potential of utilizing the Daraz dataset for predictive analysis, highlighting the benefits and wider impact on consumers and retailers. By examining the historical pricing data and product specifications, we aim to develop a model that can forecast future prices and assist stakeholders in making informed decisions.

**LITERATURE REVIEW:**

Previous research on e-commerce pricing has primarily focused on various product categories, including electronics, fashion, and home appliances. However, studies specifically targeting graphics card prices are limited. In the context of e-commerce, machine learning has been widely used to predict product prices, sales trends, and customer preferences. A significant body of work has explored the application of supervised learning techniques for price prediction. Algorithms such as linear regression, decision trees, and random forests have been popular choices due to their ability to handle structured data effectively. Ensemble methods, like gradient boosting machines, have also demonstrated superior performance in capturing complex relationships within the data. Unsupervised learning techniques, such as clustering, have been used to group products with similar characteristics. This helps identify patterns and trends that may not be immediately apparent. For example, clustering can reveal common attributes among graphics cards within specific price ranges or brands. Sentiment analysis of customer reviews is another area that has garnered attention. By analyzing textual data, machine learning models can determine the overall sentiment expressed by buyers, providing insights into customer satisfaction and preferences. Techniques such as natural language processing (NLP) and deep learning have been employed to analyze large volumes of review text.

**METHODOLOGY:**

**Data Collection and Preparation:**

We collected data from Daraz, including product titles, brands, models, specifications (e.g., memory size, clock speed), and prices. The dataset was cleaned to handle missing values, correct data formats, and remove inconsistencies, ensuring its suitability for analysis.

**Exploratory Data Analysis (EDA):**

Descriptive statistics (mean, median, standard deviation) were computed for numerical features like prices and specifications. Visualizations, such as histograms and box plots, were used to understand the distribution and identify outliers.

**Feature Engineering:**

New features were derived to enhance predictive power, such as extracting brand-specific attributes or normalizing numerical features. Aggregated metrics, like average price per brand, were also considered.

**Model Selection and Training:**

The dataset was divided into training and testing sets to evaluate model performance effectively. Various machine learning algorithms, including linear regression, decision trees, and ensemble methods, were applied to train the model.

**Model Evaluation:**

Models were evaluated using metrics such as mean squared error (MSE), root mean squared error (RMSE), and R-squared (R²) for price prediction. These metrics provided insights into the accuracy of the models and areas for improvement.

**Validation and Interpretation:**

Model predictions were validated using the testing dataset to ensure robustness and generalization. Feature importance analysis helped interpret the factors influencing graphics card prices, providing actionable insights for stakeholders.

**Deployment and Application:**

The trained model was implemented into applications or decision-making processes, such as recommending graphics cards based on predicted prices or understanding market trends. Continuous monitoring and updates were conducted to maintain accuracy and relevance.

**Documentation and Reporting:**

The entire process, including data sources, preprocessing steps, model selection rationale, and performance evaluation, was documented comprehensively.