**Diamond Price Analysis using Random Forest Algorithm**

The **Diamond Price Analysis** project aims to explore and predict diamond prices using machine learning techniques. By analyzing the relationship between various attributes of diamonds, such as carat, cut, color, and clarity, You will develop a model to predict the price of diamonds accurately. This project highlights the importance of feature selection and regression techniques in pricing problems.

**Problem Statement**

**Objective**:  
The goal of this project is to analyze the factors influencing diamond prices and build a machine learning model to predict the price based on its characteristics.

**Scenario**:  
A jewelry business wants to automate the pricing process for diamonds to ensure consistent and competitive pricing. Using historical data on diamond features and prices, the business aims to build a predictive model that estimates prices accurately and provides insights into the factors affecting diamond valuation.

**Key Questions to Address**:

1. What are the primary features that impact diamond pricing?
2. How can we preprocess and visualize the data to uncover trends and relationships?

**Deliverables**:

* **Exploratory Data Analysis (EDA)**: Insights into data distribution, relationships between features, and their impact on pricing.
* **Data Preprocessing**: Addressing missing values, encoding categorical variables, and scaling features like carat.
* **Model Development**: Implement regression models (**Use only Random Forest Algorithm**) to predict diamond prices.
* **Insights and Visualizations**: Highlight key factors influencing diamond pricing, supported by visualizations such as scatter plots and heatmaps.

This project will give you hands-on experience in handling regression problems while exploring the luxury goods market, making it an engaging and practical application of data science.