DIAMOND PRICE STATISTICS FOR
BUSINESS ANALYTICS EDUCATION AND RESEARCH[1]

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ABSTRACT

Diamond's 4C's grading system is a method to measure faceted diamond's quality according to its color, cut, clarity, and carat. The Rapaport Price List links diamond's 4C's with its price. The goal of this study is to investigate how diamond 4 C's affect the diamond price performance over the past ten years. The findings will be summarized for publication and used as a serials of case studies in business analytics and related courses.

Contribution to new knowledge:
- Using business analytics approaches, the research is aimed to find out how each "C" affects the diamond's market value.
- The study will test a few hypotheses of the diamond pricing system which helps advance knowledge in jewelry market pricing.

Contributions to classroom teaching:
- The success of this project will showcase the whole research and data analytics process that enhances students' learning outcomes from Business Analytics courses.

Methodology

The study aims to achieve both developing new knowledge and teaching goals. Hence, different methodologies will be chosen.
(1) To develop new knowledge, over 12 reports will be used to collect data on diamond price and different 4C's , which will be analyzed with modeling techniques to examine the following hypotheses:
- H1: diamond's Color grading is positively related to the price
- H2: diamond's Carat grading is positively related to the price
- H3: diamond's Clarity grading is positively related to the price
- H4: diamond's Cut grading is positively related to the price
- H5: Among diamond's 4C's, color grading is the most important factor that positively related to the price.
(2) To achieve teaching goals, students will use over 12 reports to:
- learn the concept of 4 Vs (volume, velocity, variety, and veracity) of big data, population and sample data, quantitative data and time series data, etc.
- use real world data to calculate mean, median, mode, variance, standard deviation, and coefficient of variation

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- use data visualization techniques to effectively present the relationships between different variables.
- use modeling techniques to examine the pricing model of the diamond and test the fitness of the model

Anticipated results.

(1) Developing new knowledge through big data analysis and hypotheses testing. The ultimate research goal is to systematically study the relationship between diamond's price and 4C's and publish peer-reviewed journal paper(s).

(2) Improve students' experiential learning experience through applying business analytics techniques to real world big datasets. Gain hands-on experience in solving practical problems under supervision of the instructor.