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Title: Analysis of Exam Scores for the Years 2020 and 2024 Data Sets.

Introduction: This report's goal is to examine and contrast the distributions of exam scores from two different academic years, 2020 and 2024. Using statistical computations and visualizations, we aim to identify any significant differences and trends between the two datasets.

Dataset Description: The exam scores for 2020 are grouped into ranges, with counts of students scoring within each range. Conversely, the 2024 scores are presented as individual marks. We processed both sets to derive insights into the average scores, variability in scores, and the most common scores (medians) for the year 2020.

Methodology: For the 2020 dataset, the mean and standard deviation were computed using a weighted method, considering the frequency of students in each score range. For the 2024 data, these calculations were more direct due to the availability of individual scores. The standard deviation indicates the variation in scores around the mean, which is calculated by dividing the total of all scores by the number of scores.

Mean and Standard Deviation calculation formula for 2024 Data Set.

Mean (μ) = $\frac{1}{N} \sum_{i=1}^N xi$, where N is the total number of observations and xi is each value's score.

Standard Deviation(σ)= $\sqrt{\frac{1}{N} \sum_{i=1}^N (xi - \mu)^2}$

Mean and Standard Deviation calculation formula for 2020 Data Set.

MidScore = $\frac{(MinScore+MaxScore)}{2}$

TotalScore = (MidScore * Students)

Mean (μ) = $\frac{\sum(TotalScore)}{\sum(Students)}$

Standard Deviation (SD): $\sqrt{\frac{\sum((MidScore-Mean)^2*Students)}{\sum(Students)}}$

Median Grade(V) for 2020 Exam:

Median Score = (MinScore of median bin) + $\left(\frac{\frac{total\ students}{2} - prev\ cumulative}{Students\ in\ median\ bin} \right) * (MaxScore\ of\ median\ bin - MinScore\ of\ median\ bin)$

Results: The mean score for 2020 was calculated to be 62.56 with a standard deviation of 12.93. The median score was 62.48. In 2024, the mean was higher at 69.44, with a slightly tighter standard deviation of 11.71.

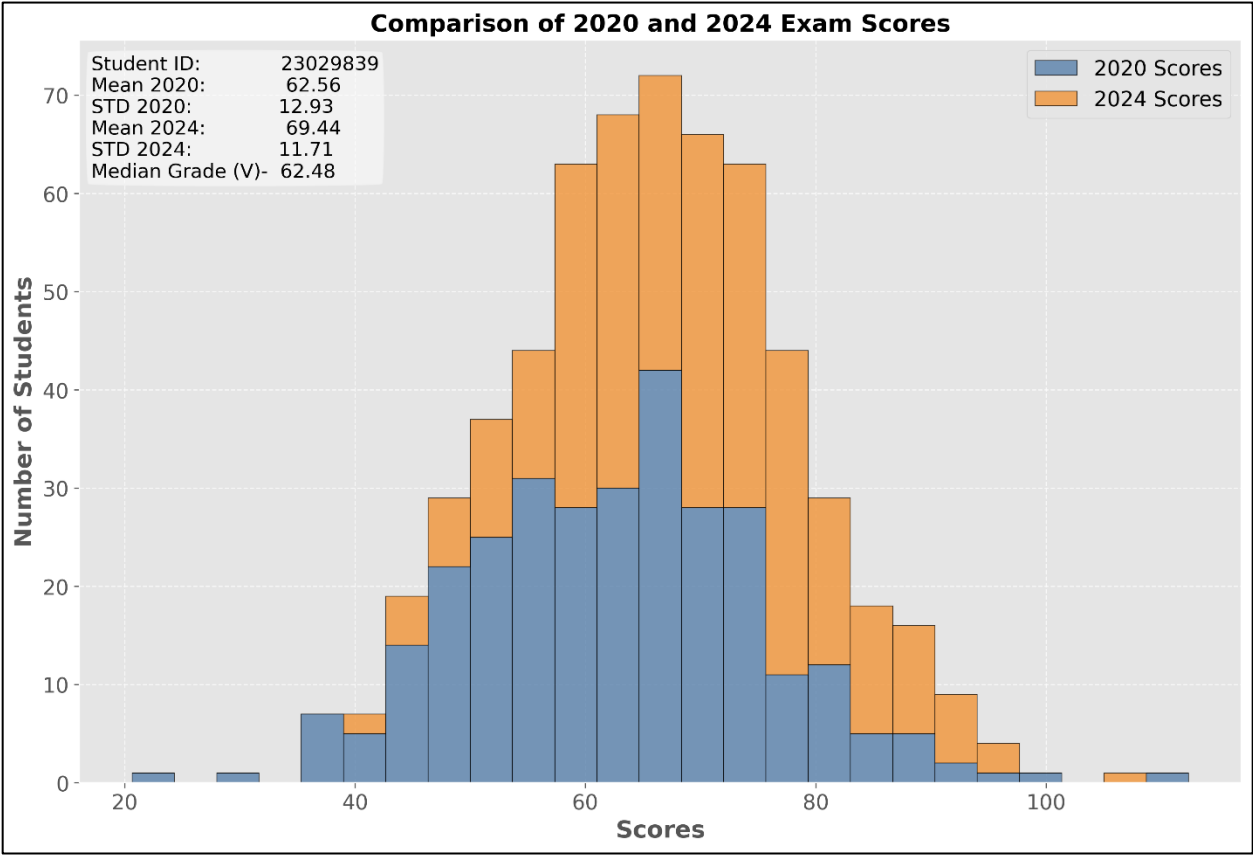
Discussion:

Performance Increase: The rise in mean scores from 62.56 in 2020 to 69.44 in 2024 suggests an overall increase in student performance.

Score Consistency: The decrease in standard deviation from 12.93 to 11.71 suggests that scores in 2024 were more consistent, with fewer extremes compared to 2020.

Median Grade (V) Analysis: The median score for 2020 is very close to the mean, indicating a symmetric distribution of scores around the average. This median offers an additional reference for the central tendency of the scores, enhancing the information given by the mean.

Graphical Analysis: Histograms color-coded by year (blue for 2020 and orange for 2024) illustrate the distribution of scores. These visuals help to highlight the upward trend in scores for 2024.



Conclusion: The analysis of exam scores from the years 2020 and 2024 indicates a general increase in scores and a tightening of score distributions around the average. Such insights are valuable for educational bodies to evaluate the impact of teaching strategies, examination standards, and student development over time.