**Education Post 12th Data Analysis Report**

**Project Overview**

The objective of this analysis is to gain insights into the characteristics of colleges and address key questions regarding the educational landscape. By understanding the data, we aim to inform strategies for improving education quality and enhancing the overall college experience. The analysis provides valuable insights and actionable recommendations for stakeholders in the education sector.

**Data Description**

The dataset includes the following features:

* **Names**: Names of various universities and colleges
* **Apps**: Number of applications received
* **Accept**: Number of applications accepted
* **Enroll**: Number of new students enrolled
* **Top10perc**: Percentage of new students from the top 10% of their high school class
* **Top25perc**: Percentage of new students from the top 25% of their high school class
* **F.Undergrad**: Number of full-time undergraduate students
* **P.Undergrad**: Number of part-time undergraduate students
* **Outstate**: Out-of-state tuition fee
* **Room.Board**: Cost of room and board
* **Books**: Estimated book costs for a student
* **Personal**: Estimated personal spending for a student
* **PhD**: Percentage of faculty with Ph.D.'s
* **Terminal**: Percentage of faculty with terminal degrees
* **S.F.Ratio**: Student/faculty ratio
* **perc.alumni**: Percentage of alumni who donate
* **Expend**: Instructional expenditure per student
* **Grad.Rate**: Graduation rate

**Basic Data Exploration and Cleaning Steps**

* **Top 5 Rows**: Display the top 5 rows of the dataset for initial inspection.
* **Last 5 Rows**: Display the last 5 rows to ensure data completeness.
* **Shape of Dataset**: Check dimensions to understand the dataset size.
* **Data Types**: Verify appropriate data types for each feature.
* **Statistical Summary**: Generate descriptive statistics for numerical features.
* **Handling Null Values**: Address any missing data appropriately.
* **Handling Duplicates**: Check and remove duplicate records.
* **Handling Outliers**: Identify outliers and assess their impact on analysis.

**Analysis and Key Findings**

**1. Application and Enrollment Analysis**

* **Average Number of Applications**: Calculate and analyze the average number of applications received.
* **Acceptance Rate**: Determine the average percentage of applications accepted.
* **Enrollment Rate**: Evaluate the average enrollment rate based on accepted applications.
* **Highest Number of Applications**: Identify the college with the highest number of applications received.

**2. Academic Excellence**

* **Top 10% Students**: Calculate the average percentage of new students from the top 10% of their high school class.
* **Top 25% Students**: Determine the average percentage of new students from the top 25% of their high school class.
* **Correlation Analysis**: Investigate correlations between top student percentages.

**3. Student Demographics**

* **Full-time Undergraduates**: Analyze the average number of full-time undergraduate students.
* **Part-time Undergraduates**: Review the average number of part-time undergraduate students.
* **Out-of-State Students**: Identify the college with the highest number of out-of-state students.

**4. Cost and Spending**

* **Room and Board Cost**: Determine the average cost of room and board.
* **Book Cost**: Calculate the average estimated book cost per student.
* **Personal Spending**: Analyze the average estimated personal spending per student.
* **Instructional Expenditure**: Evaluate variations in instructional expenditure per student.

**5. Faculty Qualifications**

* **Ph.D. Faculty**: Assess the average percentage of faculty with Ph.D.'s.
* **Terminal Degrees**: Review the average percentage of faculty with terminal degrees.
* **Correlation Analysis**: Investigate relationships between faculty qualifications and graduation rates.

**6. Student-Faculty Interaction**

* **Student/Faculty Ratio**: Determine the average student/faculty ratio.
* **Lowest Student/Faculty Ratio**: Identify the college with the lowest ratio.
* **Correlation Analysis**: Examine relationships between student/faculty ratio and graduation rates.

**7. Alumni Engagement**

* **Alumni Donations**: Calculate the average percentage of alumni who donate.
* **Correlation Analysis**: Investigate correlations between alumni donations and graduation rates.

**8. Graduation Rates**

* **Average Graduation Rate**: Determine the overall average graduation rate.
* **Highest Graduation Rate**: Identify the college with the highest graduation rate.
* **Correlation Analysis**: Explore relationships between instructional expenditure and graduation rates.

**9. Overall Insights**

* **Factors Influencing Graduation Rates**: Identify key factors influencing graduation rates based on analysis.
* **Recommendations**: Provide actionable recommendations for improving graduation rates.

**Conclusion**

This analysis provides actionable insights and recommendations for colleges and educational stakeholders to enhance education quality and improve the student experience.

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