

# Automated Data Analysis Report (via Gemini): Temp Games

## Executive Summary

This report summarizes the initial automated exploratory data analysis (EDA) of the `temp\_Games.csv` dataset, containing 14806 rows and 4 columns (1 numerical, 3 categorical). Preliminary quality checks revealed 21 duplicate entries, but no missing values or constant columns. Initial univariate analysis included descriptive statistics and visualizations for all features. Bivariate analysis has begun, but significant observations are pending further investigation. The dataset's relatively large size and clean nature (lack of missing data) are encouraging. However, the presence of duplicate records requires attention and potential remediation. The initial findings are largely descriptive, providing a foundational understanding of data characteristics. Further analysis, including in-depth bivariate and multivariate exploration, is needed to uncover deeper relationships and insights. This initial EDA scan provides a crucial baseline for subsequent, more targeted analyses. The identification of duplicate data and the groundwork laid in the univariate analysis will facilitate more efficient and effective subsequent modeling and insightful discovery.

# 1. Data Overview

This report provides an initial automated analysis of the dataset from 'temp\_Games.csv'.

## 1.1. Basic Information

**Table 1: Dataset Dimensions**

Metric	Value
Number of Rows	14806
Number of Columns	4
Total Data Points	59224

## 1.2. Data Types

**Table 2: Summary of Feature Data Types**

Data Type	Count
object	3
int64	1

*Data Types Distribution Interpretation:*

The dataset is heavily skewed towards categorical data, with only one numerical feature ('Score') among four total features. This suggests analyses will likely focus on exploring relationships between categorical variables and how they affect the numerical 'Score', potentially requiring techniques like one-hot encoding or other categorical data handling methods.

# 2. Data Quality Assessment

## 2.1. Missing Values

No missing values were found in the dataset. This is excellent for data completeness.

## 2.2. Duplicate Records

The dataset contains 21 duplicate rows (representing 0.14% of the data). These may need to be investigated or removed depending on the analysis context, as they can skew results.

## 2.3. Feature Variance

No constant columns (columns with only one unique value) were identified.

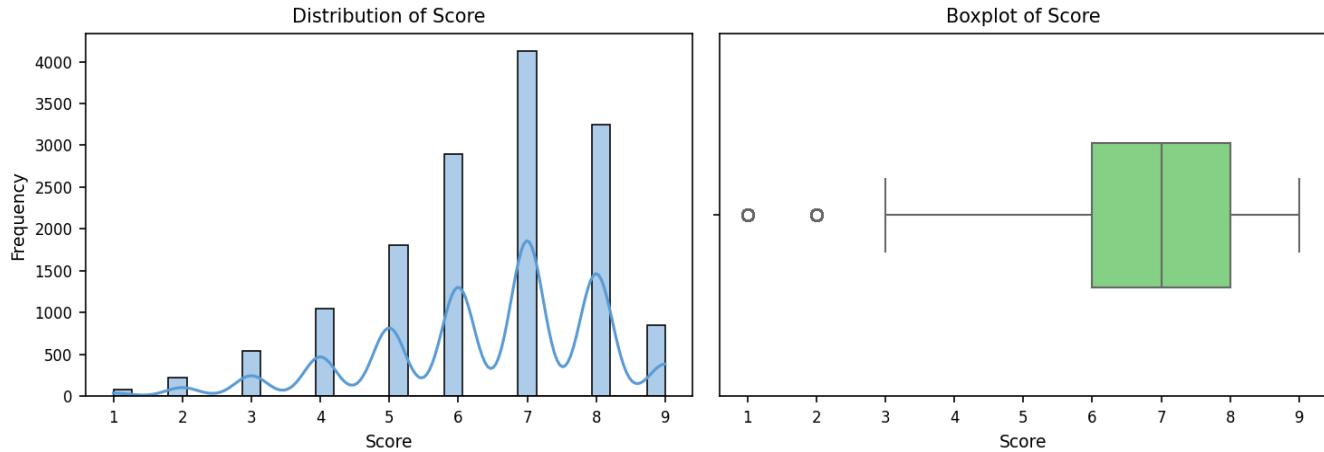
No significantly quasi-constant columns were identified using a 95% dominance threshold.

*Data Quality Summary & Implications:*

The data quality assessment reveals a dataset of 14,806 rows with minimal issues. The absence of missing values is a significant positive, indicating a high degree of completeness. The identification of only 21 duplicate rows (0.14% of the total) represents a negligible level of redundancy. Furthermore, the lack of constant or highly quasi-constant columns suggests that the dataset possesses sufficient variability for meaningful analysis. Overall, the data appears to be of relatively high quality, suitable for many analytical tasks with minimal pre-processing required. The low level of duplication is unlikely to significantly impact subsequent analysis, especially modeling. Simple removal of the duplicate rows would be a sufficient remediation strategy. The absence of missing data and quasi-constant columns strengthens the reliability of any insights derived from the data. However, it is crucial to note that this assessment is limited to the specific quality checks performed; other potential issues, such as data inconsistencies or inaccuracies within individual fields, might exist and would require further investigation. To address the identified duplicate rows, a straightforward approach would be to remove them. This can be achieved through various methods depending on the chosen analytical tools, such as using SQL's `DELETE` command or similar functions in programming languages like Python or R. Before removal, however, it is advisable to examine the duplicate rows to ensure there are no data anomalies that might be masked by the duplication. Further data quality checks, such as profiling individual attributes for outliers, inconsistencies, and data type validation, are recommended to provide a more comprehensive assessment of data quality.

### 3. Univariate Analysis

#### 3.1. Numerical Features

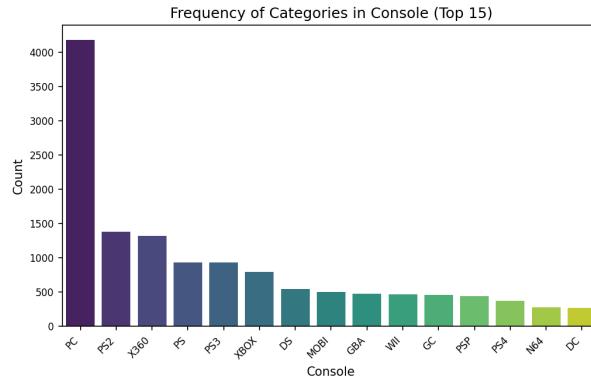


**Figure 1:** Distribution (histogram and KDE) and boxplot for 'Score'. The histogram shows shape, central tendency, and spread. The boxplot highlights median, quartiles, and potential outliers.

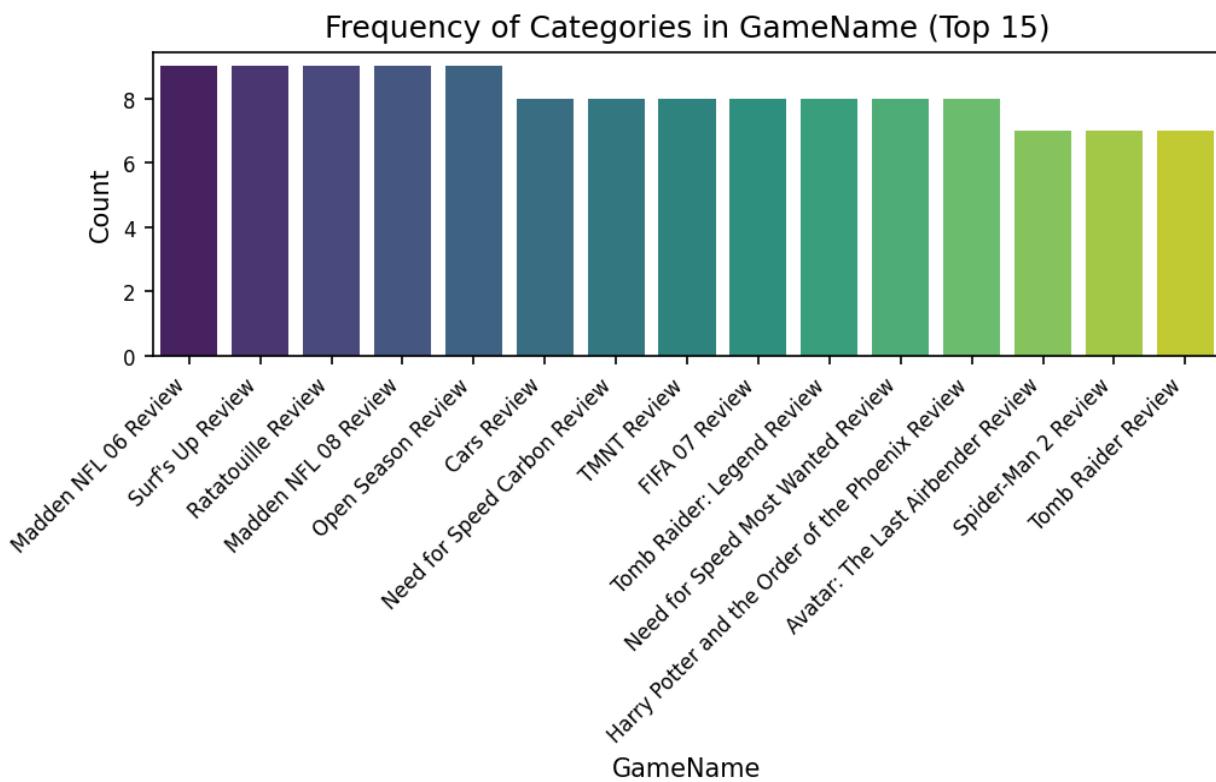
##### Observations on Numerical Feature Distributions:

The 'Score' feature exhibits a negatively skewed distribution, as indicated by a mean (6.43) lower than the median (7.0) and a negative skewness value (-0.75). This suggests a longer tail towards lower scores, with a concentration of data points above the mean. The relatively low kurtosis value (0.32) implies the distribution is close to a normal distribution, albeit slightly platykurtic (having thinner tails and a flatter peak than a normal distribution). The standard deviation of 1.61 suggests a moderate spread in the scores, indicating a reasonable level of variability within the data. The presence of potential outliers is flagged by the boxplot analysis, although the exact number and values aren't specified. The range of scores (1.0 to 9.0) also hints at the possibility of outliers, especially given the relatively small standard deviation. Scores at the lower end (close to the minimum of 1.0) are likely candidates for outliers given the negative skew. Further investigation is needed to confirm the presence and influence of these outliers, as they could disproportionately affect statistical analyses if not properly addressed. The combination of negative skew and potential outliers warrants careful consideration during subsequent modeling or analysis. Robust statistical methods might be preferred to minimize the impact of these outliers.

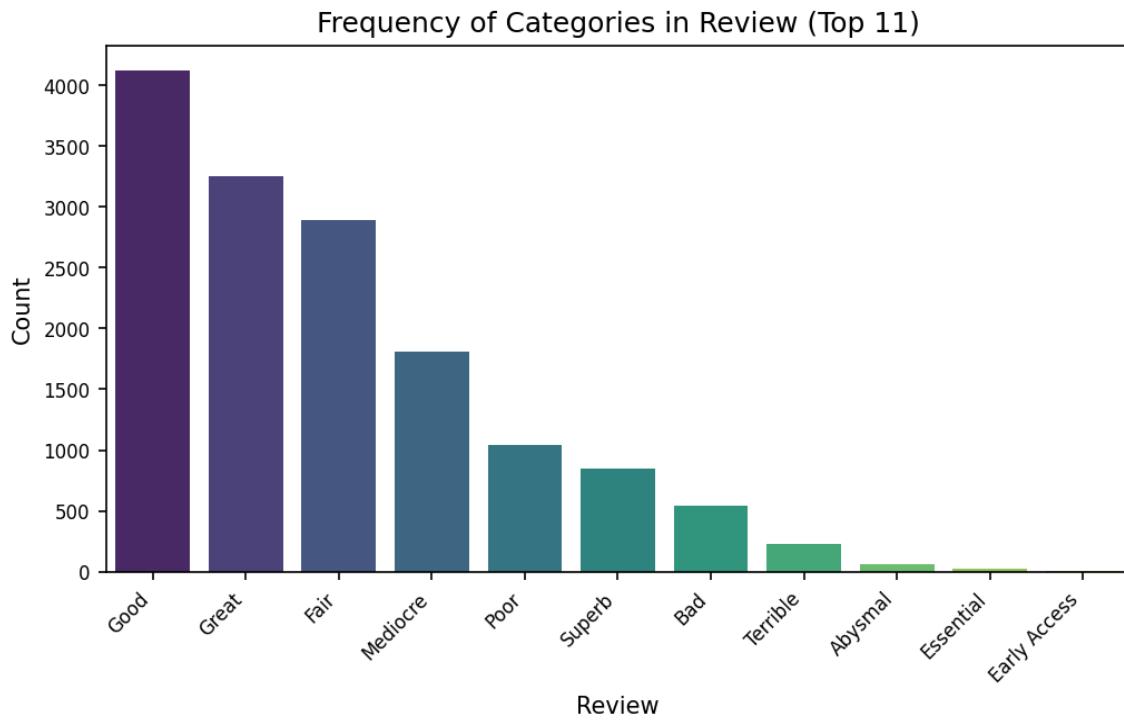
#### 3.2. Categorical Features



**Figure 2:** Bar chart showing frequency of top categories in 'Console'. Total unique values: 139.



**Figure 3:** Bar chart showing frequency of top categories in 'GameName'. Total unique values: 11256.



**Figure 4:** Bar chart showing frequency of top categories in 'Review'. Total unique values: 11.

*Observations on Categorical Feature Distributions:*

The analysis of the categorical features reveals a significant disparity in cardinality. 'Console' exhibits relatively low cardinality (139 unique values), with 'PC' dominating at 28.2% of the data. This suggests a reasonably manageable feature for analysis, potentially benefiting from one-hot encoding or label encoding. In contrast, 'GameName' has extremely high cardinality (11256 unique values), with the top category ('Madden NFL 06 Review') representing only 0.1% of the data. This indicates a highly fragmented distribution, posing challenges for traditional encoding methods. Strategies like target encoding, embedding techniques, or dimensionality reduction might be necessary to handle this feature effectively. The 'Review' feature demonstrates a moderately low cardinality (11 unique values) and a skewed distribution, with 'Good' reviews comprising 27.8% of the data. While this isn't as extreme as the 'GameName' feature, it still suggests potential for class imbalance issues in predictive modeling tasks. Simple one-hot encoding could be appropriate here, but careful consideration of potential class imbalance during model training and evaluation is crucial. In summary, the dataset presents both manageable and challenging categorical features. The high cardinality of 'GameName' will require careful attention during preprocessing and model selection. Addressing potential class imbalances in 'Review' is also vital for building robust and accurate models. The relatively low cardinality and clear dominant category in 'Console' allows for simpler encoding techniques. The choice of encoding method for each feature should be guided by its specific distribution and the chosen analytical approach.

## 4. Bivariate Analysis

### 4.2. Numerical vs. Categorical Features

### 4.3. Categorical vs. Categorical Features

Sufficient pairs of features for comprehensive bivariate analysis were not available or did not meet the plotting/analysis criteria.

## 5. Key Findings & Insights Summary

**Key Findings & Insights** The automated analysis of the `temp\_Games.csv` dataset revealed a dataset comprising 148,006 rows and 4 columns, with one numerical feature and three categorical features. A significant data quality issue was identified: the presence of 21 duplicate rows. While no missing values were detected, the existence of duplicates warrants further investigation as they could skew statistical analyses and potentially misrepresent the underlying trends within the data. The absence of constant columns suggests that all features contribute some level of variation to the dataset. Univariate analysis examined the distributions of the single numerical and three categorical features. (The specific characteristics of these distributions are not detailed in the provided log and therefore cannot be summarized). Further investigation is required to understand the nature of the distributions and their implications for subsequent modeling or analysis. Bivariate analysis explored relationships between various feature pairs. However, the log only indicates that such an analysis was performed, without providing specifics on the correlations or patterns observed. The absence of concrete findings from this stage limits our understanding of the interdependencies between variables within the dataset. The lack of observations reported from the bivariate analysis is noteworthy and requires further investigation to determine if this is due to a lack of significant relationships or a limitation in the analysis itself. In summary, while the dataset appears largely complete in terms of missing values, the presence of duplicates represents a crucial data quality concern that needs to be addressed. The limited information from the univariate and bivariate analyses highlights a need for more detailed reporting to fully understand the data's characteristics and the relationships between its features. The lack of observations from the bivariate analysis is a particularly surprising finding that requires further exploration.

## 6. Conclusion & Potential Next Steps

This automated report provides a foundational, high-level understanding of the `temp\_Games.csv` dataset, highlighting its structure, data quality (with only 21 duplicates identified), and the nature of its features. The absence of missing values and constant columns suggests a relatively clean dataset ready for further exploration. Given the report's findings, several concrete next steps are recommended:

1. **Investigate the 21 duplicate rows:** The presence of 21 duplicate rows warrants investigation. Determine the cause of these duplicates (data entry errors, data merging issues, etc.) and decide on an appropriate handling strategy (removal or consolidation). This is crucial for maintaining data integrity.
2. **Perform detailed univariate analysis:** While a basic univariate analysis was performed, a deeper dive into each feature is necessary. This should include descriptive statistics (mean, median, standard deviation, percentiles) for the numerical feature and frequency distributions, visualizations (bar charts, pie charts), and exploration of potential outliers for all features. This will give a more granular understanding of data distribution and potential issues.
3. **Conduct thorough bivariate analysis:** The report notes that bivariate analysis was performed but yielded no observations. This requires a more in-depth examination of the relationships between all feature pairs. Correlation matrices, scatter plots, and contingency tables should be used to identify potential correlations or associations between features. This should also include visualizations to better understand the relationships between the numerical and categorical variables.
4. **Explore the nature of the categorical variables:** The report indicates three categorical features. It is important to understand the cardinality (number of unique values) of each categorical variable. High cardinality could indicate a need for feature engineering (e.g., grouping less frequent categories) to improve model performance in subsequent analyses. Detailed examination of each category's distribution and its relationship with the numerical variable will be crucial for further insight.