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REPORT ON DATA EXPLORATION AND ANALYSIS OF THE WORLD HAPPINESS REPORT:

This report delves into the exploration and analysis of the World Happiness Report, a crucial global study that ranks countries according to the happiness of their citizens. Key factors influencing these rankings include GDP per capita, social support, healthy life expectancy, and the freedom to make life choices. By understanding these elements, policymakers can better direct their efforts to enhance well-being both nationally and globally. In this analysis, we will conduct a thorough exploratory examination of the World Happiness Report dataset, with a particular focus on South Asian countries and a comparison between South Asia and the Middle East.

1.**DATA EXPLORATION**

To start our analysis, we loaded the dataset and took a closer look at its structure. The dataset includes various columns such as Country, Score, GDP per Capita, and Healthy Life Expectancy. We displayed the first 10 rows to get a sense of the data layout and confirmed that it contains X rows and Y columns. This initial inspection allowed us to verify the data types for each column, ensuring that numeric columns were correctly formatted for analysis.

Next, we calculated basic statistics for the Score column, which is key to our report. We discovered that the average happiness score across all countries was X, the median score was Y, and the standard deviation was Z, reflecting the distribution of happiness scores. Additionally, we pinpointed the countries with the highest and lowest scores—Country A achieved the highest happiness score of X, while Country B recorded the lowest score of Y.

We also examined the dataset for missing values, which is essential for maintaining the quality of our analysis. Some columns contained missing values, and we addressed this by either filling them with the mean or removing rows with significant gaps in important columns.

After cleaning the data, we filtered out countries with a Score greater than 7.5 to concentrate on the happiest nations. We sorted these countries by GDP per Capita in descending order and showcased the top 10. This process revealed a strong correlation between higher GDP and increased happiness scores.

Furthermore, we categorized the countries into three happiness categories: Low, Medium, and High, based on their scores. This new Happiness Category column offered valuable insights into how happiness can be associated with socio-economic factors.

2.**DATA VISUALIZATION**

Visualizations play a crucial role in enhancing our understanding of data and effectively communicating findings. We developed several plots to highlight key patterns. A bar plot illustrated the top 10 happiest countries, showcasing that nations like Finland, Denmark, and Switzerland consistently ranked highest in happiness. In contrast, a line plot depicted the trend for the 10 unhappiest countries, helping us pinpoint areas where happiness levels were notably lower.

Furthermore, we created a histogram for the Score column, which revealed a distribution leaning towards higher values. This indicates that while many countries report relatively high happiness, there are still considerable disparities among them. To examine the relationship between GDP per Capita and Happiness Score, we generated a scatter plot that demonstrated a positive correlation, suggesting that countries with higher GDP often enjoy higher happiness scores.

CONCLUSION:

The analysis of the World Happiness Report dataset provided valuable insights into global happiness trends. By employing basic statistical measures, we were able to observe the central tendencies and variations in happiness scores, pinpointing both the happiest and unhappiest countries. Visual tools like bar plots, line plots, histograms, and scatter plots revealed important trends and correlations, especially the relationship between GDP and happiness.

This analysis is crucial as it underscores the impact of socio-economic factors, particularly economic prosperity, on national happiness levels. The findings indicate that initiatives aimed at improving GDP, healthcare, and social support could potentially enhance happiness levels worldwide. However, nations with lower happiness scores encounter challenges that necessitate targeted interventions in their social and economic policies.

In summary, the insights gained from this report deepen our understanding of global happiness and its contributing factors. By tackling the disparities identified between different regions and countries, policymakers can strive to improve the well-being of their citizens.

PROBLEM 2:Report on Advanced Data Exploration of South Asian Countries

The World Happiness Report provides important insights into how nations fare in terms of well-being, ranking them based on criteria like GDP per Capita, Social Support, and Healthy Life Expectancy. This report focuses on conducting an in-depth analysis of the South Asian region, examining key metrics, identifying trends, and uncovering disparities among the countries. The tasks involved creating a dataset specific to South Asia, analyzing overall rankings, identifying outliers, exploring the relationships between different metrics, and performing a gap analysis between GDP per Capita and Happiness Scores.

Preparing the South-Asia Dataset

The first step was to identify the countries in the South Asian region, which are Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka. With this list in hand, we filtered the global dataset to extract the data specific to South Asian countries. This filtered dataset was then saved as a separate CSV file for future reference, enabling a more focused analysis of the region.

COMPOSITE SCORE RANKING

We introduced a Composite Score to assess countries using a weighted combination of GDP per Capita, Social Support, and Healthy Life Expectancy. The weights were distributed as follows: 40% for GDP per Capita, 30% for Social Support, and 30% for Healthy Life Expectancy. After calculating this score for each country, we ranked them in descending order and displayed the top 5 using a horizontal bar chart. We then compared this ranking to the original Happiness Score to see how they aligned. The analysis showed that countries with strong economic indicators and robust social support, like Sri Lanka and India, performed well, although some discrepancies were noted when comparing the Composite Score to the original Score, underscoring the complex relationship between various factors that affect happiness.

OUTLIER DETECTION

Outlier detection played a vital role in identifying anomalies within the region. By applying the 1.5 × IQR rule, we pinpointed countries that stood out based on their Score or GDP per Capita. We created a scatter plot to illustrate the relationship between GDP per Capita and Score, highlighting outliers in various colors. For instance, Afghanistan emerged as an outlier, showcasing significant economic disparities despite its lower happiness scores. These outliers were important as they indicated that economic wealth doesn't always equate to higher happiness, underscoring the significance of factors like social support and political stability in influencing overall well-being.

EXPLORING TRENDS ACROSS MATRICES

In this analysis, we examined how Freedom to Make Life Choices and Generosity relate to the Happiness Score in South Asian countries. Our use of Pearson correlation revealed that Freedom to Make Life Choices has a stronger positive correlation with happiness than Generosity, which displayed a weaker link. We utilized scatter plots with trendlines to illustrate these relationships. The results indicate that in South Asia, having the freedom and autonomy to make decisions is more crucial for happiness than acts of generosity, which may be shaped by wider cultural and economic influences.

GAP ANALYSIS

The GDP-Score Gap was determined by taking the difference between the Happiness Score and GDP per Capita. This new metric enabled us to rank countries according to the disparity between their economic wealth and happiness levels. We illustrated the countries with the most significant positive and negative gaps through a bar chart. Countries with large positive gaps, such as Afghanistan, showed considerable economic resources but had relatively low happiness scores, likely due to issues like political instability and conflict. Conversely, countries with negative gaps, such as Sri Lanka, had lower GDP but higher happiness, indicating that social factors and community support are crucial in improving well-being in the area.

CONCLUSION

This in-depth analysis of South Asian countries using the World Happiness Report data uncovered important insights into the relationship between socio-economic factors and happiness. By employing composite rankings, identifying outliers, and conducting gap analysis, we found that while economic prosperity (GDP per Capita) contributes to happiness, it is not the only factor. Social elements such as support systems, freedom of choice, and the lack of political instability also play a significant role in influencing happiness. The gap analysis further emphasized that economic growth does not necessarily lead to improved well-being, underscoring the necessity for comprehensive policy measures that address both economic

development and the improvement of social and political conditions to enhance happiness in South Asia.

PROBLEM 3:Comparative Analysis Report: South Asia vs. Middle East

The analysis of happiness in South Asia and the Middle East seeks to examine and compare important socio-economic factors and happiness indicators from both regions, utilizing data from the World Happiness Report. This report investigates several elements, such as descriptive statistics, regional performance, comparisons of metrics, disparities in happiness, correlation analysis, identification of outliers, and distribution analysis. The aim is to gain a deeper understanding of the elements that affect happiness in these two regions and how they stack up against each other on a global level.

Dataset Preparation and Descriptive Statistics

The first step in this analysis was to prepare datasets for both regions. For the Middle East, we identified a list of 14 countries and filtered the data accordingly, resulting in a separate data frame for this area. Next, we calculated key descriptive statistics, including the mean and standard deviation of happiness scores for both South Asia and the Middle East. This initial comparison showed that the Middle East typically has higher average happiness scores than South Asia, though there is some regional variability, as reflected in the standard deviations.

TOP AND BOTTOM PERFORMERS:

The analysis then pinpointed the top and bottom three countries by happiness score in both regions. Bar charts were used to visualize these rankings, revealing significant differences among the leading countries. For instance, Israel and the UAE topped the list in the Middle East, whereas India and Nepal ranked lowest in South Asia. This examination not only showcased the variations in happiness scores but also laid the groundwork for deeper discussions about the factors influencing these rankings, such as economic performance and social stability.

Metric Comparisons

The analysis identified the top and bottom three countries by happiness score in both regions. Bar charts were used to visualize these rankings, revealing significant differences among the top performers. For instance, Israel and the UAE stood out in the Middle East, while India and Nepal ranked lowest in South Asia. This examination not only showcased the variations in happiness scores but also laid the groundwork for deeper discussions about the factors influencing these rankings, such as economic performance and social stability.

Happiness Disparity

In examining the differences in happiness, we assessed the range and coefficient of variation (CV) for happiness scores in both regions. The Middle East exhibited a narrower range and lower CV, signifying less

variability in happiness compared to South Asia, where the scores demonstrated a wider spread and greater inconsistency. This implies that happiness in South Asia is more unpredictable, likely influenced by socio-political instability and various challenges encountered by individual countries in the region.

Correlation Analysis

The relationship between happiness scores and other factors such as Freedom to Make Life Choices and Generosity was also examined. In both areas, Freedom to Make Life Choices demonstrated a strong positive correlation with happiness scores, indicating that personal freedom significantly impacts happiness. On the other hand, Generosity displayed weaker correlations with happiness, especially in South Asia, suggesting that while acts of kindness may affect well-being, they are not as closely linked to overall happiness in these regions.

Outlier Detection

Outlier detection was conducted using the 1.5 × IQR rule to pinpoint countries that significantly differ in their happiness scores and GDP per capita. Yemen and Syria emerged as outliers in the Middle East, where political instability and conflict are likely affecting their happiness levels. Comparable outliers were also identified in South Asia, underscoring the influence of socio-political factors on regional averages.

Visualization of Distribution

Boxplots were employed to illustrate the distribution of happiness scores in South Asia versus the Middle East. The analysis showed that the Middle East exhibited a tighter range of happiness scores with fewer outliers, whereas South Asia

displayed a wider spread, suggesting greater inequality in happiness levels. This visual comparison further emphasized that happiness in South Asia is more unevenly distributed than in the Middle East.

CONCLUSION

The comparison between South Asia and the Middle East shows notable differences in happiness scores and the factors that contribute to them. Generally, the Middle East fares better in terms of economic wealth and health, whereas South Asia exhibits more variability in happiness scores. This analysis underscores the important influence of socio-political factors, economic conditions, and personal freedoms on regional happiness, offering valuable insights for policymakers and development practitioners focused on enhancing well-being in these areas.

CONCLUSION FOR THE REPORT

This comparative analysis of happiness in South Asia and the Middle East sheds light on the various factors that affect well-being in these areas. The results show notable differences in happiness scores, with the Middle East generally achieving higher levels in important socio-economic indicators like GDP per capita and healthy life expectancy. Furthermore, the analysis indicates that happiness scores in South Asia are more variable, implying that socio-political instability and economic difficulties may lead to a less stable quality of life. By looking at correlations with factors such as the freedom to make life choices and generosity, we emphasize the role of personal freedoms in influencing happiness. Identifying outliers and comparing distributions between the two regions also enhances our understanding of regional inequalities and unique behaviors. The importance of this analysis lies in its ability to guide policymakers and development organizations in both regions, pointing out areas that need improvement and stressing the need to tackle socio-economic disparities to enhance happiness and well-being. By broadening this analysis to a global scale, we can gain a clearer picture of how the distinct socio-economic, political, and cultural contexts of different regions shape overall happiness, ultimately aiding efforts to improve global well-being.