Individual Report

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In this project, I mainly want to explore the relationship between the global happiness index and factors such as GDP per capita, educational inequality and historical colonial background through data visualization. I will show and analyze a series of charts to reveal how these key factors affect the happiness index of various countries.

1.Data preparation and visualization methods

Data set overview: The data set used in this part contains the happiness index, GDP per capita, education inequality index, HIV/AIDS and life expectancy of different countries in the same period after data processing, and the data of this period is further averaged.

Visualization method: Data analysis is performed through Tableau and python, such as box plots, heat maps, scatter plots, etc.

2.Data analysis and chart display

As is shown in Figure 1, a scatter plot is used to show the relationship between GDP per capita and happiness index. The scatter color represents the data of different years to form an intuitive visual effect.

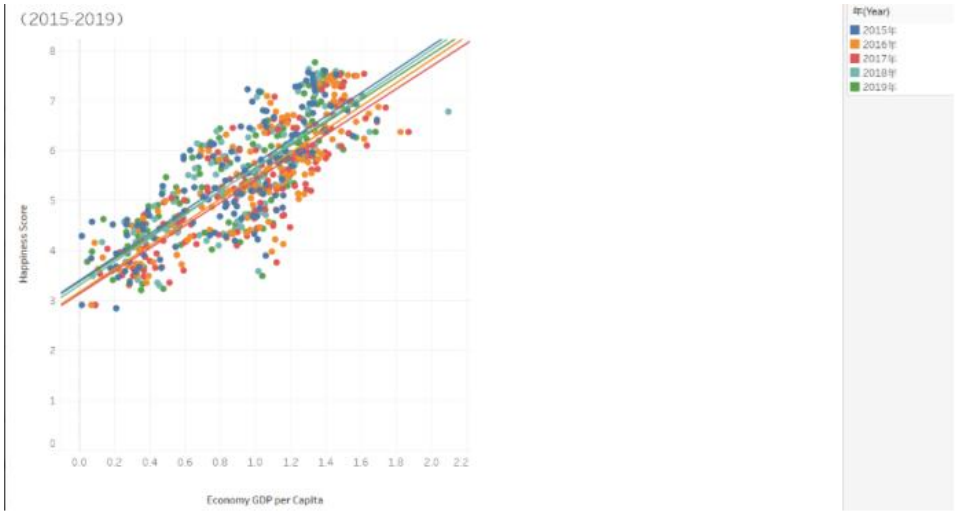

Figure 1: Scatter Plot of GDP Per Capita and Happiness Index

In Figure 2,the relationship between GDP per capita, education imbalance index and happiness index is shown through the scatter plot. The size of the bubble represents the happiness index, and the color also changes with the happiness index. The X-axis and Y-axis are GDP per capita and education imbalance index, respectively, to form a more intuitive visual effect.

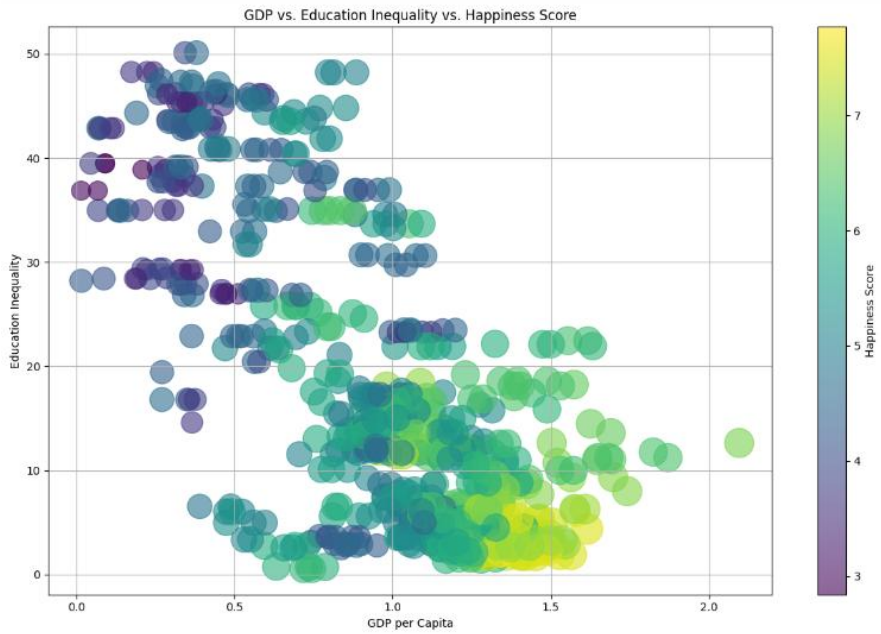

Figure 2: Scatter plot of GDP Per Capita, Education Imbalance Index, and Happiness Index

Figure 3 presents a 3D Scatter Plot that uses colors to highlight the dimensions of the happiness index and shows the relationship between the three in three-dimensional space. It can be found from the figure that countries with higher per capita GDP tend to have lower education inequality index and higher happiness index. This shows that economic development and education equity play an important role in improving happiness. At the same time, although some countries have lower per capita GDP, they have higher happiness indexes due to lower education inequality index, which shows that education equity also plays a key role in national happiness.

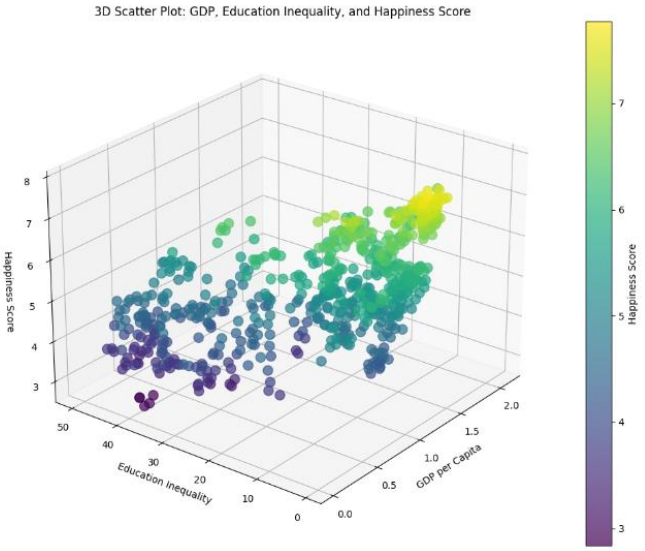

Figure 3: 3D Scatter Plot of GDP Per Capita, Education Inequality Index, and Happiness Index

The distribution of GDP per capita in various countries with British and French colonial backgrounds is shown through density curves(Figure 4). In the peak comparison, the red (British colonies) has a wider peak and is distributed at higher GDP values. The blue curve (French colonies) shows a sharp peak near the lower per capita GDP value, indicating that most countries are concentrated at lower per capita GDP levels. The red curve is more scattered and extends to higher per capita GDP levels, which means that the variation of per capita GDP in this group is greater and contains more high-GDP countries. The blue curve is narrower, indicating that the variation of per capita GDP in this colonial background group is smaller.

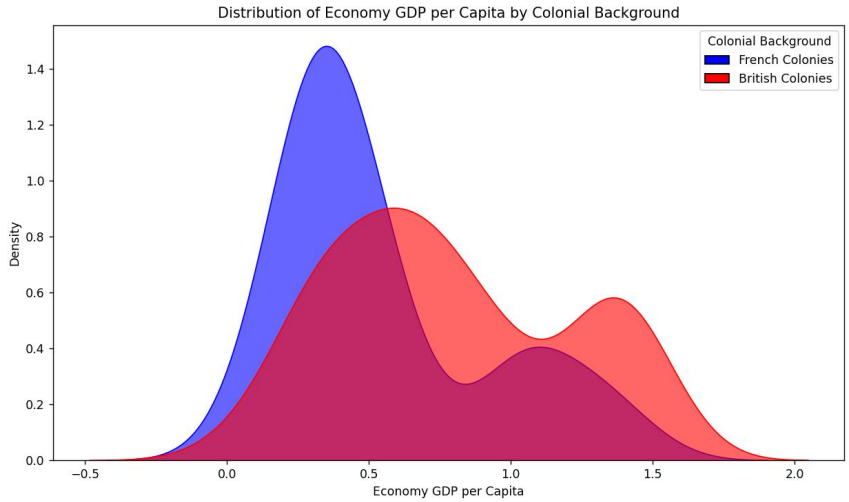

Figure 4: Density Curves of GDP Per Capita in Countries with British and French Colonial Backgrounds

The differences in the distribution of happiness indexes in countries with different historical colonial backgrounds are compared through box plots(Figure 5). The median happiness index of the former British colonies (about 5) is significantly higher than that of the former French colonies (about 4). The happiness index of the British colonies is widely distributed, with some countries having a happiness index close to 7, while the happiness index of the French colonies is generally concentrated between 3 and 5, with some low outliers. It can be found that there is a certain similarity with the GDP distribution curve above.

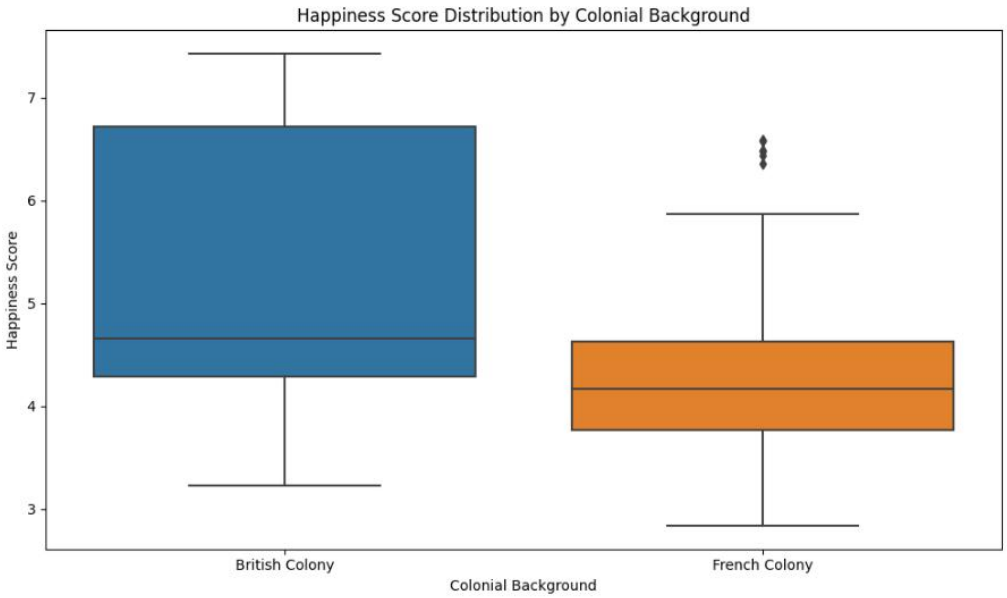

Figure 5: Box Plot of Happiness Index in Countries with Different Historical Colonial Backgrounds

Finally,Figure 6 presents a correlation matrix.The correlation matrix is used to analyze the correlation between the happiness index and other variables.

Happiness index: It is highly positively correlated with GDP per capita (0.79), indicating that economic development is one of the key factors affecting the happiness index. It is also strongly positively correlated with life expectancy (0.75), indicating that health and quality of life play an important role in happiness. It is moderately negatively correlated with educational inequality (-0.67), indicating that educational equity has a certain impact on improving happiness. It is negatively correlated with the prevalence of HIV/AIDS (-0.44), indicating that high disease burden has a certain negative impact on the happiness index, but the degree is weaker than other

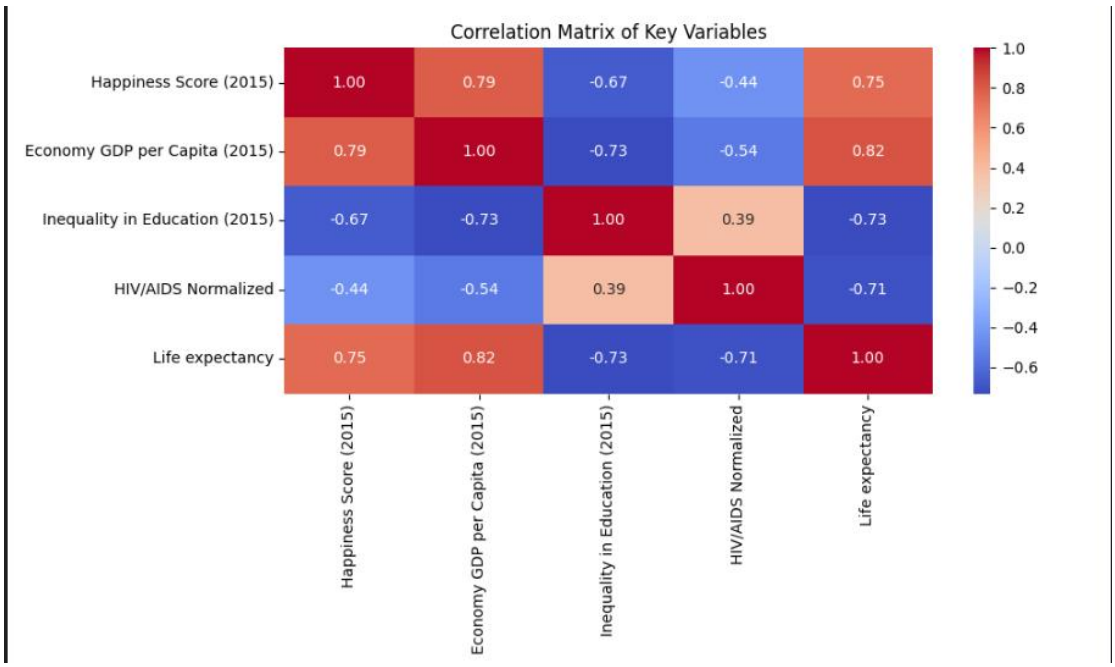

Figure 6: Correlation Matrix of Happiness Index and Other Variables

3.Conclusion

GDP per capita has a significant positive impact on happiness, and economic development is an important way to improve happiness. Educational equity is also one of the key factors in improving happiness, and reducing educational inequality helps to improve overall happiness. Due to structural differences such as economy and education, different historical colonial backgrounds also have an impact on the happiness index. At the same time, it is necessary to strengthen public health intervention to reduce diseases and improve the physical health of the people, which can also indirectly improve the level of happiness.