

David Song
Professor Ishigaki
CS 131, Processing Big Data
6 August 2024

Is Money Truly the Root of All Evil?

Objective:

- ❖ To investigate the relationship between economic prosperity (measured by wealth) and subjective well-being (happiness) and mortality rates (life expectancy), with the aim of identifying the direction and strength of the associations between these variables.

Hypothesis:

- ❖ I think that there will be a positive and statistically significant correlation between wealth and happiness, such that an increase in wealth will be associated with higher levels of happiness.
- ❖ Additionally, I expect that there will be a positive and statistically significant correlation between wealth and life expectancy, such that an increase in wealth will be associated with longer life expectancy.

Dataset Metadata:

Dataset Metadata			
	Happiness	Wealth	Life expectancy
mean	5.4	9.1	62.9
sd	1.1	1.1	7.7
min	2.6	6.4	32.2
max	7.9	11.6	76.5
25%	4.5	8.2	57.70
50%	5.3	9.3	64.9
75%	6.2	10.1	68.4

Correlation Matrix			
	Happiness	Wealth	Life expectancy
Happiness	1.0	0.7	0.7
Wealth	0.7	1.0	0.8
Life expectancy	0.7	0.8	1.0

Summary:

- ❖ The dataset used in this project is the World Happiness Report 2020, which contains information on various factors that contribute to happiness, such as wealth, social support, life expectancy, and corruption perceptions. After cleaning the data by removing missing values and renaming columns, the dataset was filtered to include only the necessary columns for the analysis. The dataset contains 156 entries.
- ❖ The analysis showed a positive correlation between wealth and happiness, as well as between wealth and life expectancy. The scatter plots and relplot visualization demonstrate this relationship. The mean, standard deviation, minimum, maximum, and quartiles of the dataset were also calculated and presented in a summary dataframe.
- ❖ It turns out that my hypothesis was indeed correct. In conclusion, money brings happiness and makes you live longer LOL. My data manipulation unfortunately did not reveal whether money is indeed the root of all evil or not... but as long as you're happy and live a long life, right?

Tools Explanation:

- ❖ **Pandas:**
 - `pd.read_csv()` to read the World Happiness Report 2020 dataset from a URL and load it into a Pandas dataframe.
 - `df.rename()` to rename the columns of the dataframe to more descriptive names, such as "Happiness", "Wealth", and "Life expectancy".
 - `df.dropna()` to remove rows with missing values from the dataframe.
 - `df.filter()` to filter the dataframe to include only the necessary columns for the analysis.
- ❖ **Seaborn:**
 - `sns.scatterplot()` to create two scatter plots that show the relationship between wealth and happiness, and between wealth and life expectancy.
 - `sns.relplot()` to create a relplot that shows the relationship between wealth, happiness, and life expectancy, with size and color representing different values.
- ❖ **Matplotlib:**
 - `plt.subplots()` to create a figure with two subplots, which were used to display the scatter plots.
 - `plt.title()`, `plt.xlabel()`, and `plt.ylabel()` to set the title, x-axis label, and y-axis label of each subplot.
 - `plt.tight_layout()` to adjust the layout of the subplots to prevent overlapping.
 - `plt.legend()` to add a legend to the plot.
 - `plt.show()` to display the plot.
- ❖ **NumPy:**
 - `df.mean()`, `df.std()`, `df.min()`, `df.max()`, and `df.quantile()` to calculate summary statistics of the dataset, such as the mean, standard deviation, minimum, maximum, and quartiles.

Plots:

