**Individual Proposal by Vicky Xu**

Expected group members: Yixuan Zhao, Xiaohan Ma, Yue Yu.

· Research question: Does the time of participation in social activities affect the level of happiness?

· Variables and how to explore on them

I plan to choose the overall social time as the independent variable and the life satisfaction score (0-10) as the dependent variable.

The plots and visualizations I am going to include in the exploration are scatter plots, box plots and histogram.

1. Scatter plot: Display social time on the x-axis and happiness scores on the y-axis to visually assess any correlation or trend between these two variables. This plot is appropriate for showing the relationship between a continuous independent variable and a continuous dependent variable.
2. Box plot: Box plots are useful for visualizing the median, quartiles, potential outliers and spread of data.
3. Histogram: Separate histograms for social time and happiness scores can be used to understand their individual distributions and identify any skewness.

· Analyses

Correlation analysis and linear regression analysis: Start with a correlation analysis to evaluate the strength and direction of the relationship between social time and life satisfaction score. We can calculate the Pearson correlation coefficient between social time and life satisfaction scores and visualize the data using a scatter plot to check for a potential linear trend.

If a significant correlation is found, proceed with a simple linear regression to quantify the effect of social time on life satisfaction score. This time we should fit a simple linear regression model and evaluate the regression coefficients. In addition, we need to check the residuals to confirm assumptions about the model , such as linearity, normal distribution of residuals, and homoscedasticity.

· Hypothesis for possible results

The life satisfaction score is significantly positively correlated with social time, and it forms a linear trend, for increased social interaction contributes to higher happiness due to emotional support, reduced loneliness, and greater overall life satisfaction.