

Group Analysis write-up for project one

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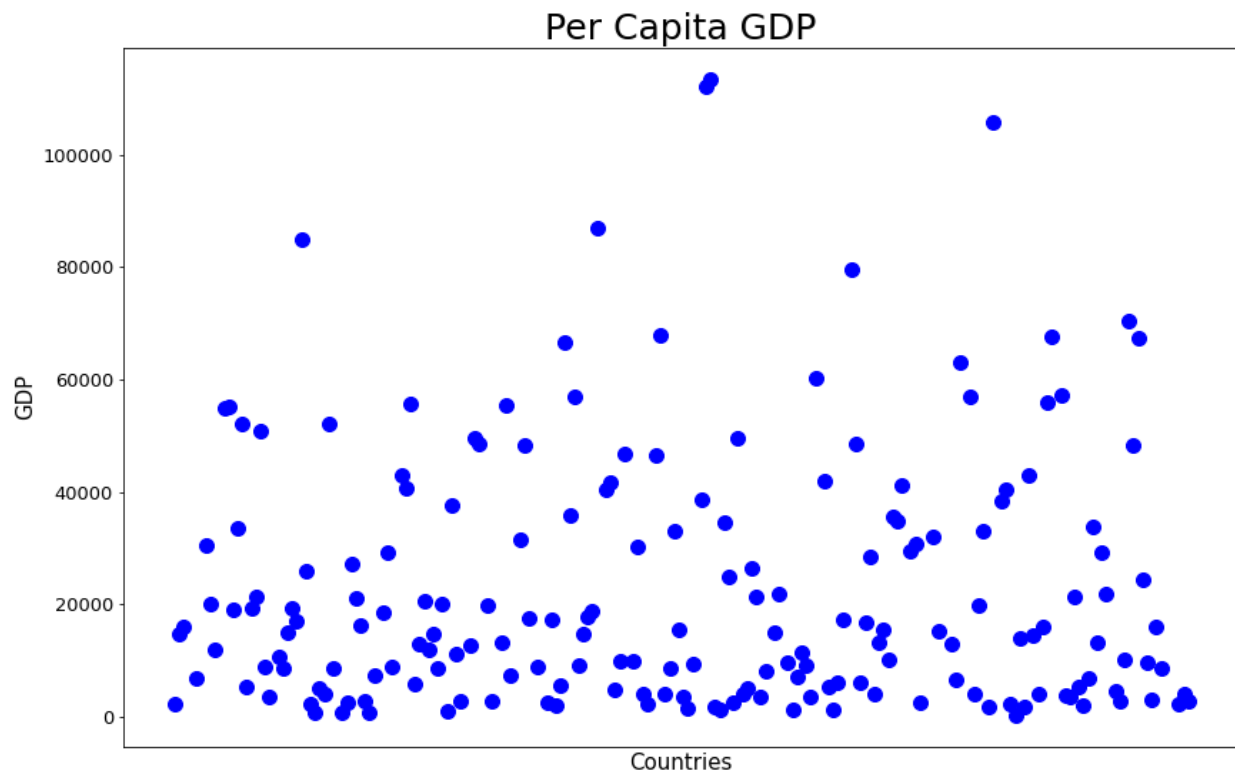
Hypothesis

Richer, happier, longer-lived, more fertile and urban countries will consume more meat.

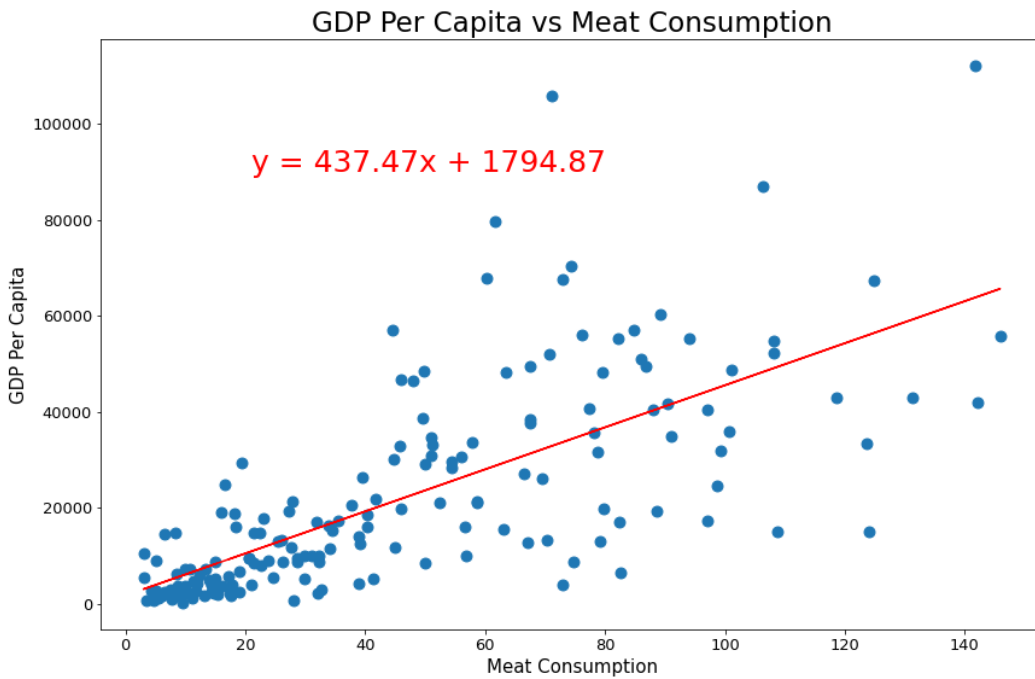
Correlation and Regression

Meat Consumption vs. GDP Regression

GDP is a monetary measure of the market value of all the final goods and services produced in a specific time period. Per capita GDP calculated as a country's GDP divided by its population. The per capita GDP observations were plotted in the following visualization. There is a grouping of data points towards the bottom of the plot, with the average per capita GDP amount of \$22,687, however, there are several countries with per capita GDP of over \$100,000.



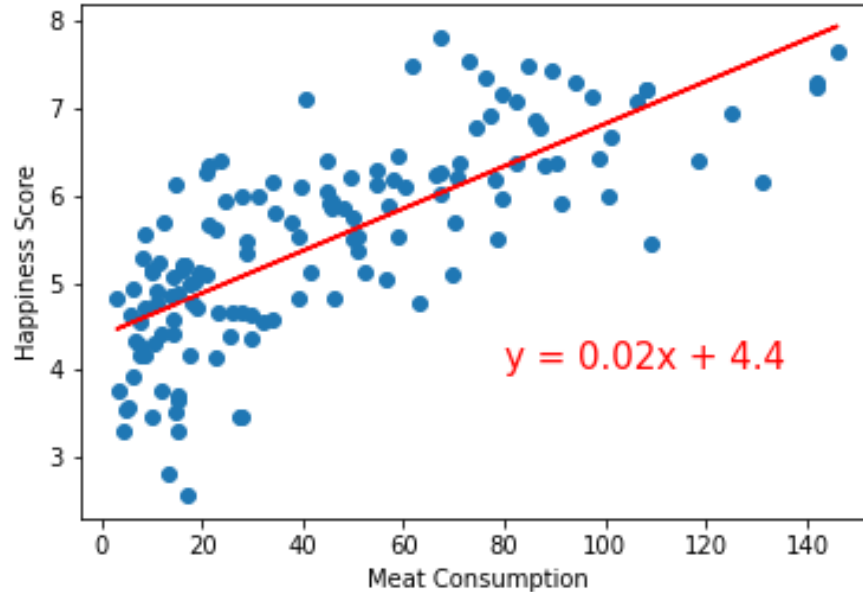
When analyzing per capita GDP and meat consumption, there is a highly positive correlation between meat consumption and per capita GDP with a correlation coefficient of 0.51. As meat consumption increases, so does per capita GDP as indicated by the linear regression equation of $y = 437.47x + 1794.87$.



Meat Consumption vs. Happiness Score Regression

The plot shows the relationship between meat consumption and happiness score. A regression line is added on the graph, as well. The correlation coefficient between world meat consumption and happiness score is 0.744. The correlation coefficient is positive so the happiness score should increase when meat consumption increases. This is proved by the regression line we have.

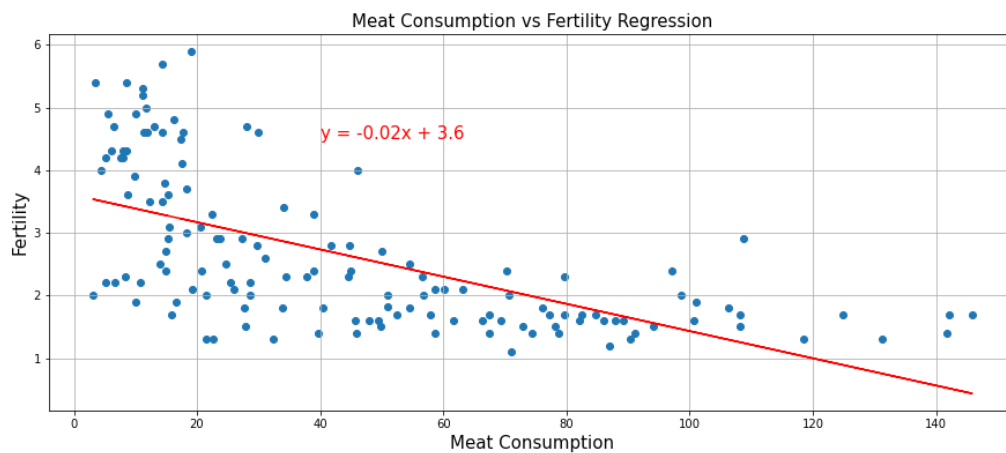
Meat Consumption vs. Happiness Score in the World with Regression Line



Meat Consumption vs. Fertility Regression

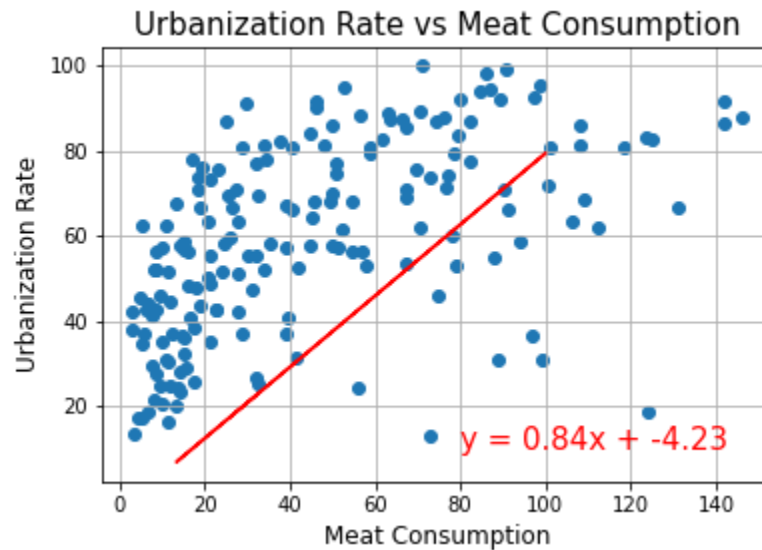
R value is -0.598771

The above graph is a scatter plot with a regression. It is comparing Meat consumption as the constant variable and fertility rate as our dependent variable. By creating this graph we can see the relationship between Meat Consumption and Fertility rate. A regression has been added to the graph as well. The first thing to note about the relationship is that it is negative. It seems that as meat consumption increases fertility rate decreases. The regression equation predicts that if meat consumption increases by one that fertility rate decreases by 0.02. The strength of this relationship seems fairly strong if taking into account the R value which is -0.598771. Taking into account the regression and the R value it could be said that there is a strong correlation between Fertility and Meat Consumption.



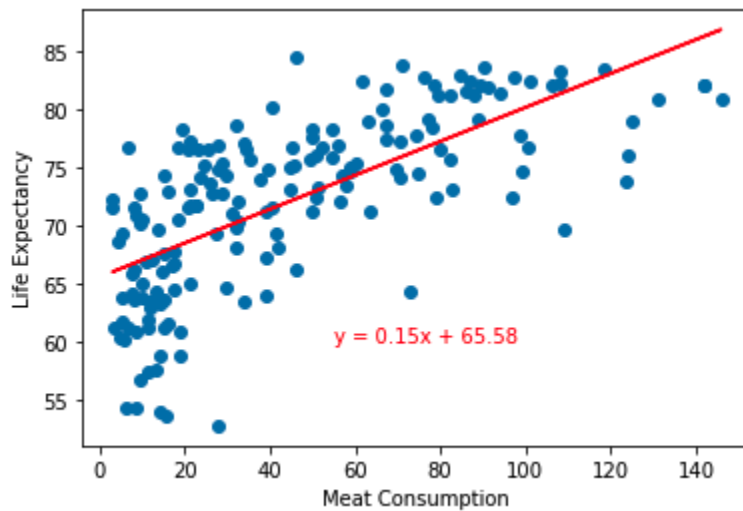
Urbanization Rate vs. Meat Consumption

For urbanization rate vs meat consumption, the r value is: 0.53487, indicating a moderate positive correlation between urbanization rate and meat consumption. The more meat a country consumes, the higher its urbanization rate is likely to be. The r-squared value is: 0.28609. While the two factors are correlated, meat consumption can only explain 30% of the urbanization rate.



Meat Consumption vs. Life Expectancy

The R value is 0.685394, indicating a moderate positive correlation between meat consumption and life expectancy. Life expectancy is expected to increase as meat consumption increases. However, there are other factors that determine life expectancy and the increase in life expectancy cannot be attributed to meat consumption alone



R values summary:

Happiness: r value is 0.744

Life expectancy: r value is 0.685

Urbanization: r value is 0.535

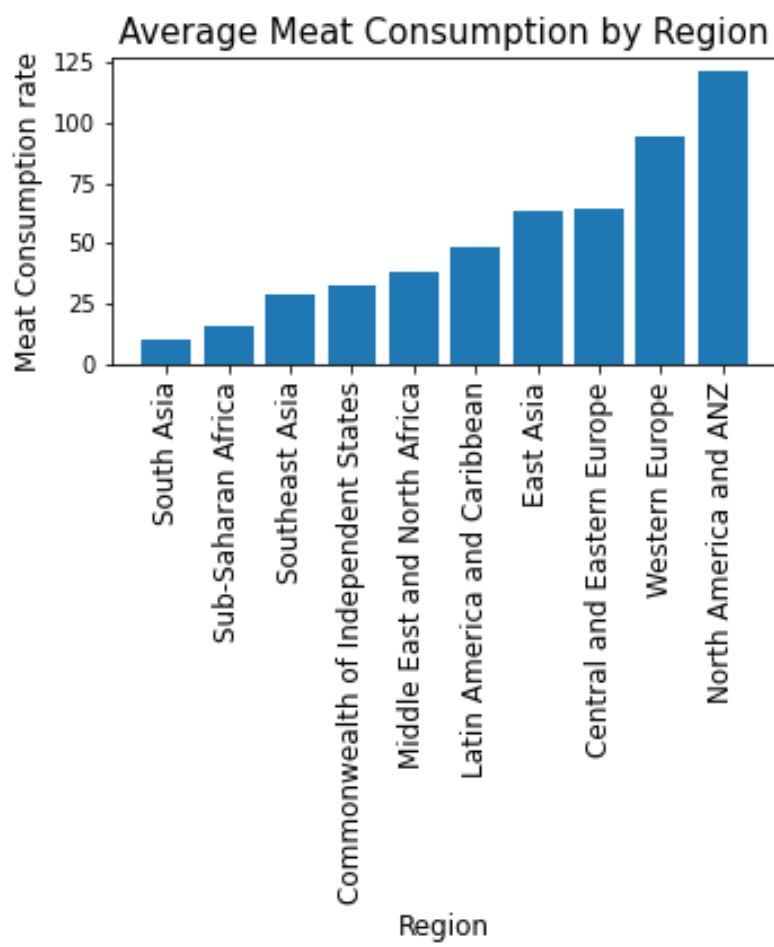
GDP: r value is 0.51

Fertility: r value is -0.599

Our hypothesis that richer, longer-lived, urban, and happy countries consume more meat is supported. However, fertility has a negative correlation with meat consumption, which we did not predict in our hypothesis.

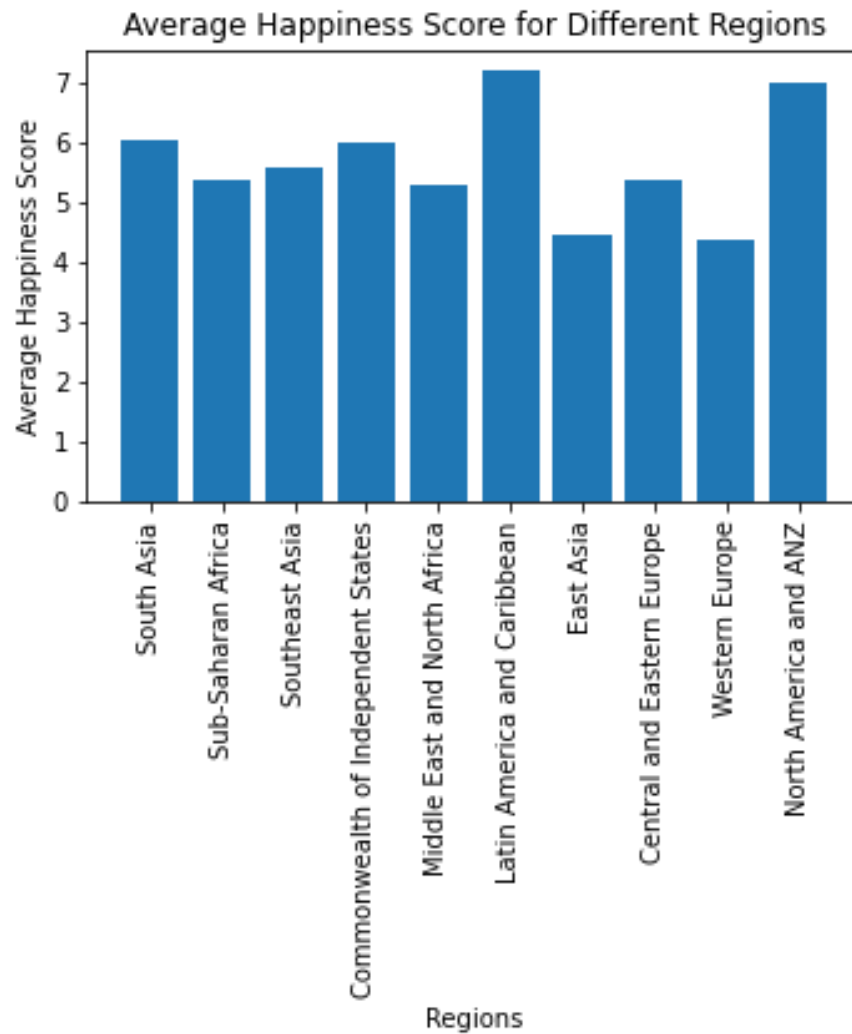
Rates by Region (bar charts)

Average Meat Consumption by Region



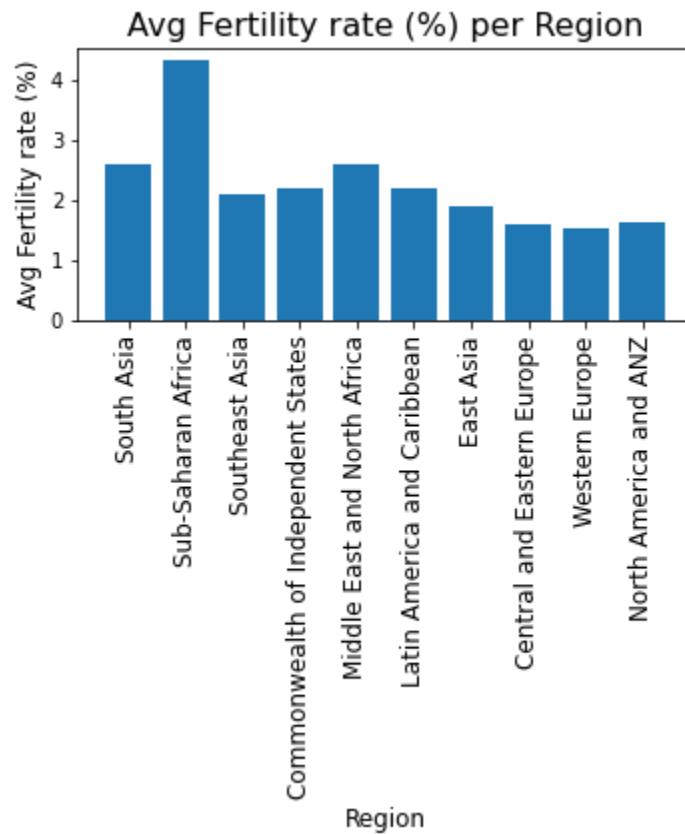
Grouped Data by Region Happiness

The Average Happiness Score for different Regions graph is sorted by increasing average meat consumption. The graph does not show the trend of increasing perfectly, but for most of the regions having high meat consumption will have a higher average happiness score.



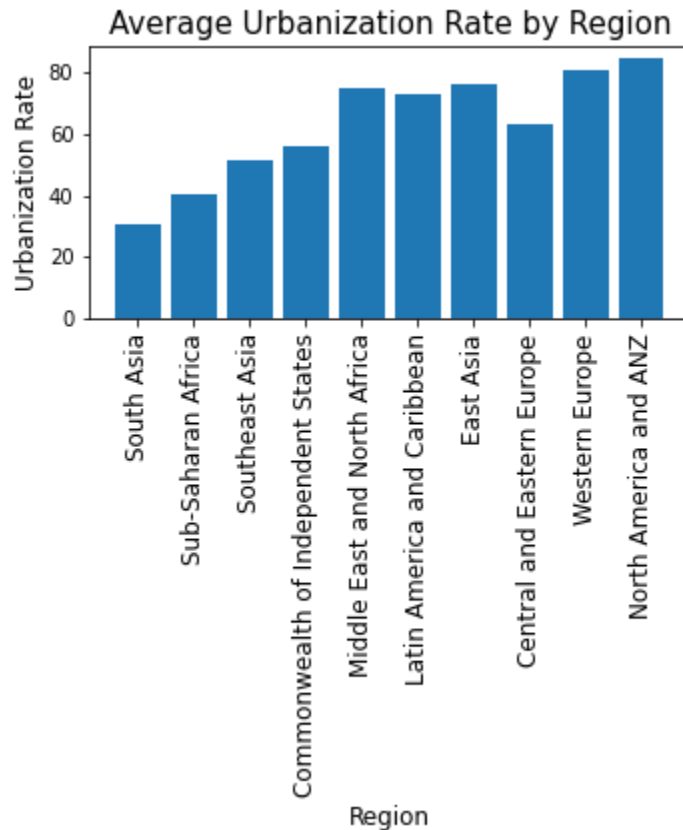
Grouped Data by Region Fertility

The data was grouped by region to see if the relationship between meat consumption and Fertility stays the same as when not grouped by region. Then 2 different bar charts were created, one for fertility and one for meat consumption. By visually comparing the 2 graphs we can see that there still is a negative relationship between the two variables though it is not as strong.



Grouped Data by Region Urbanization

Sorted by increasing meat consumption. Supports the findings of the scatter plot--urbanization rate is positively correlated with meat consumption, though the correlation is moderate, leading to a few points of disagreement (Central and Eastern Europe having lower rates than the preceding regions.)

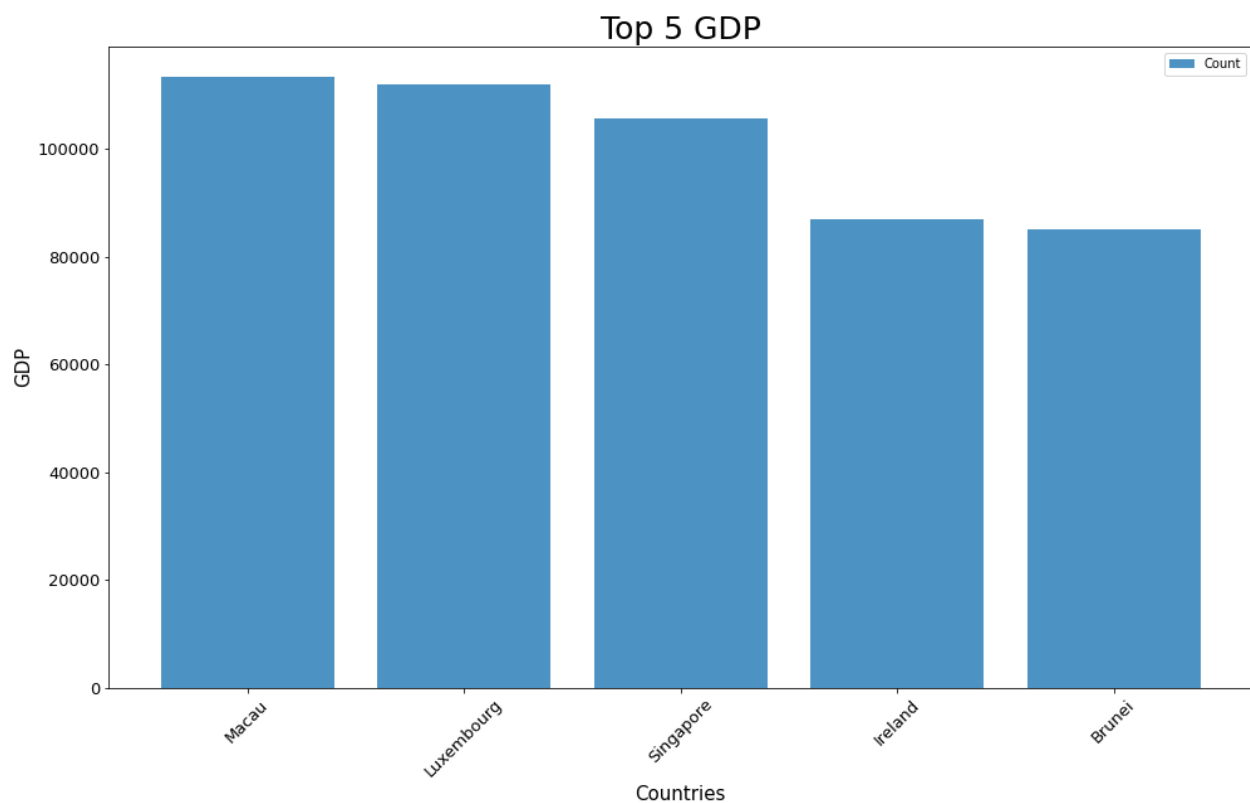


Bar Chart summary:

We grouped by region and averaged each metric, then sorted the regions by meat consumption rate to see how happiness scores, urbanization rate, and fertility rate compared to the meat consumption trend. The overall relationship indicated by the regression analysis was still present, though there was more variation.

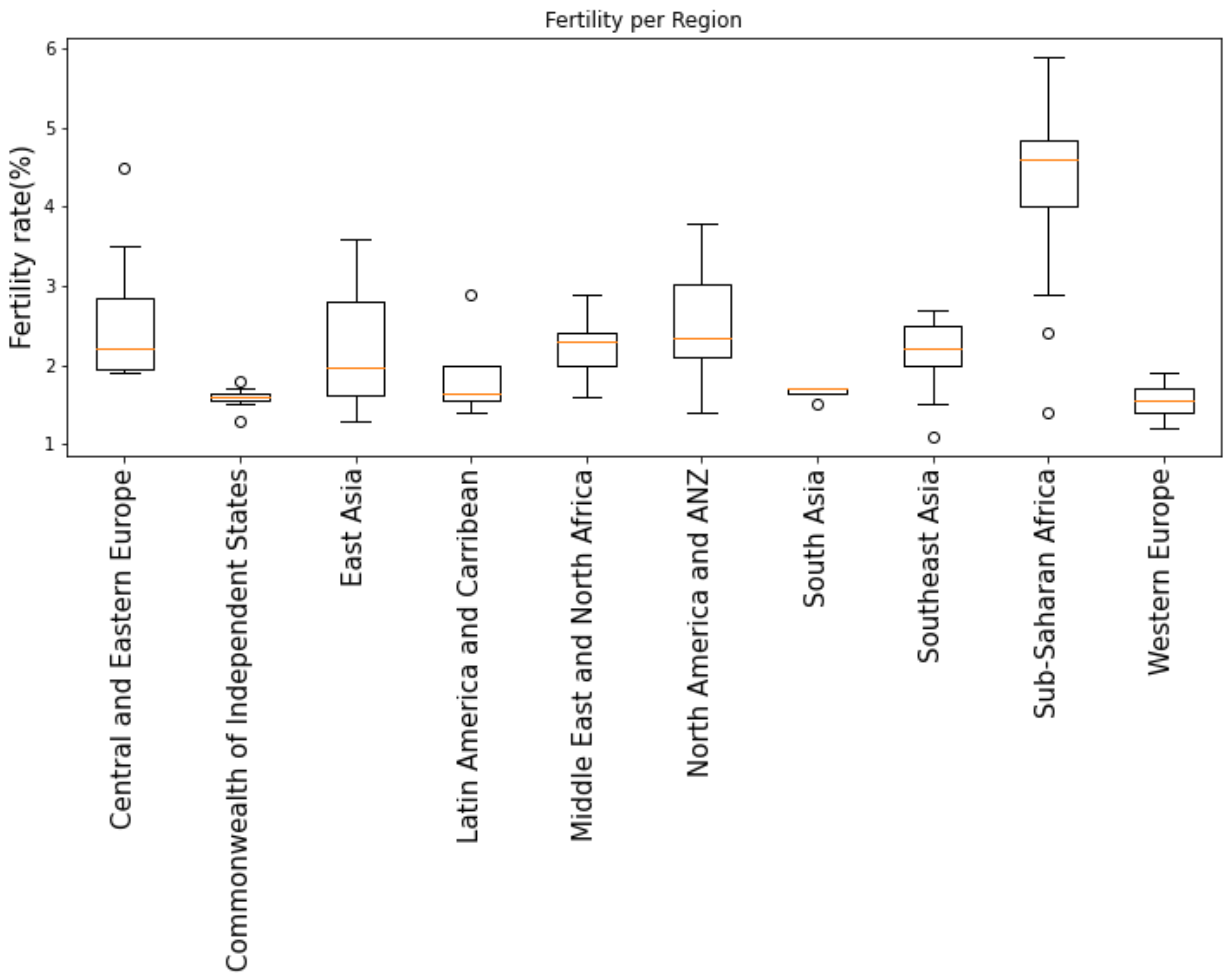
Bar chart of Top 5 GDP

The following bar graph illustrates the top 5 per capita GDP countries in the study. The top per capita GDP producing country is Macau followed by Luxembourg, Singapore, Ireland, and Brunei. The reasons for the high per-capita GDP values are the countries vary. For example, Macau is the largest gambling centre of the world and Brunei is a large exporter of oil and natural gas.



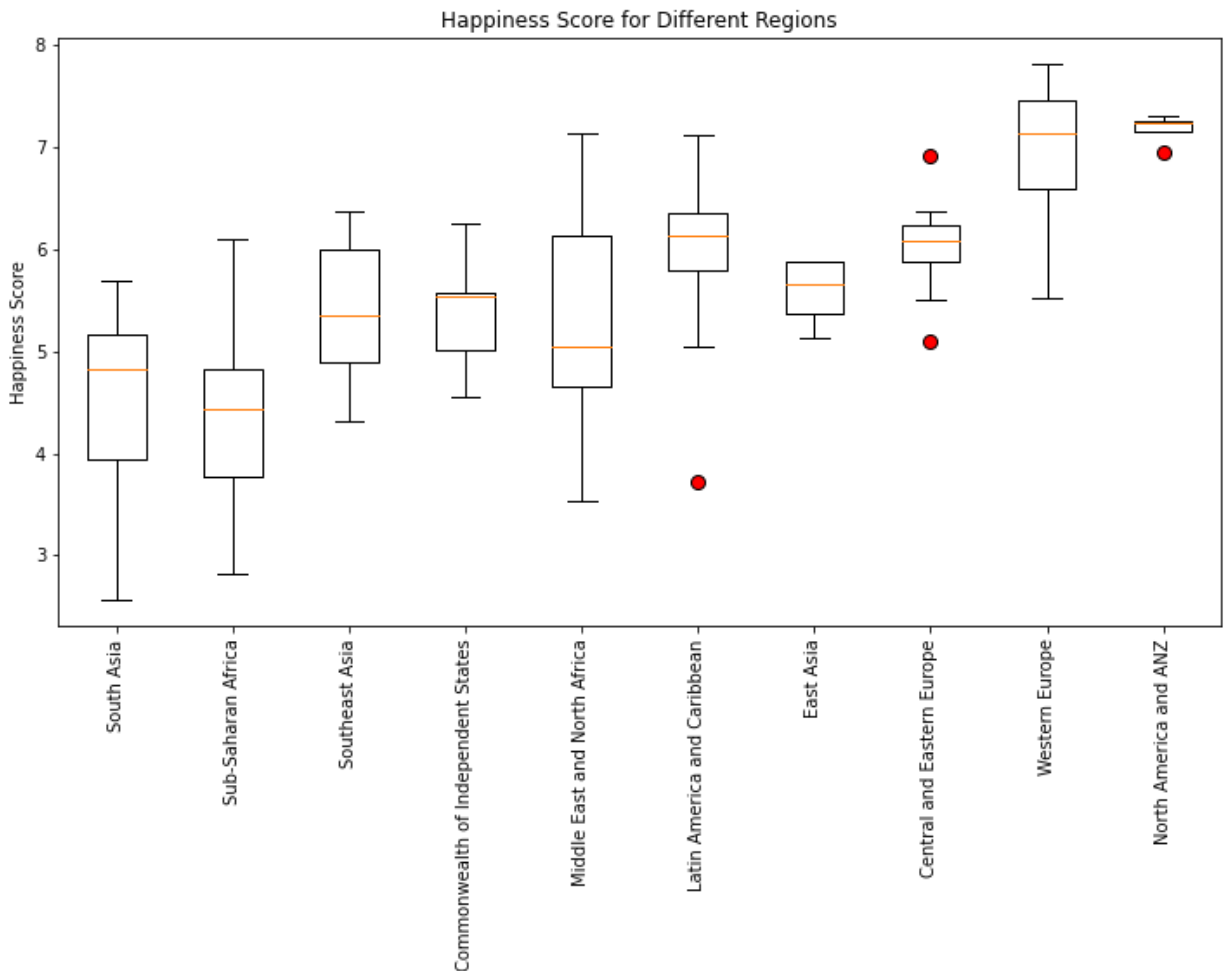
Boxplot for Fertility by Region

A box plot was created to see if there were outliers when grouping by region and it can be seen that there are a few outliers. The boxplot also allows a visual comparison of the median and the quartiles of fertility rate between regions.



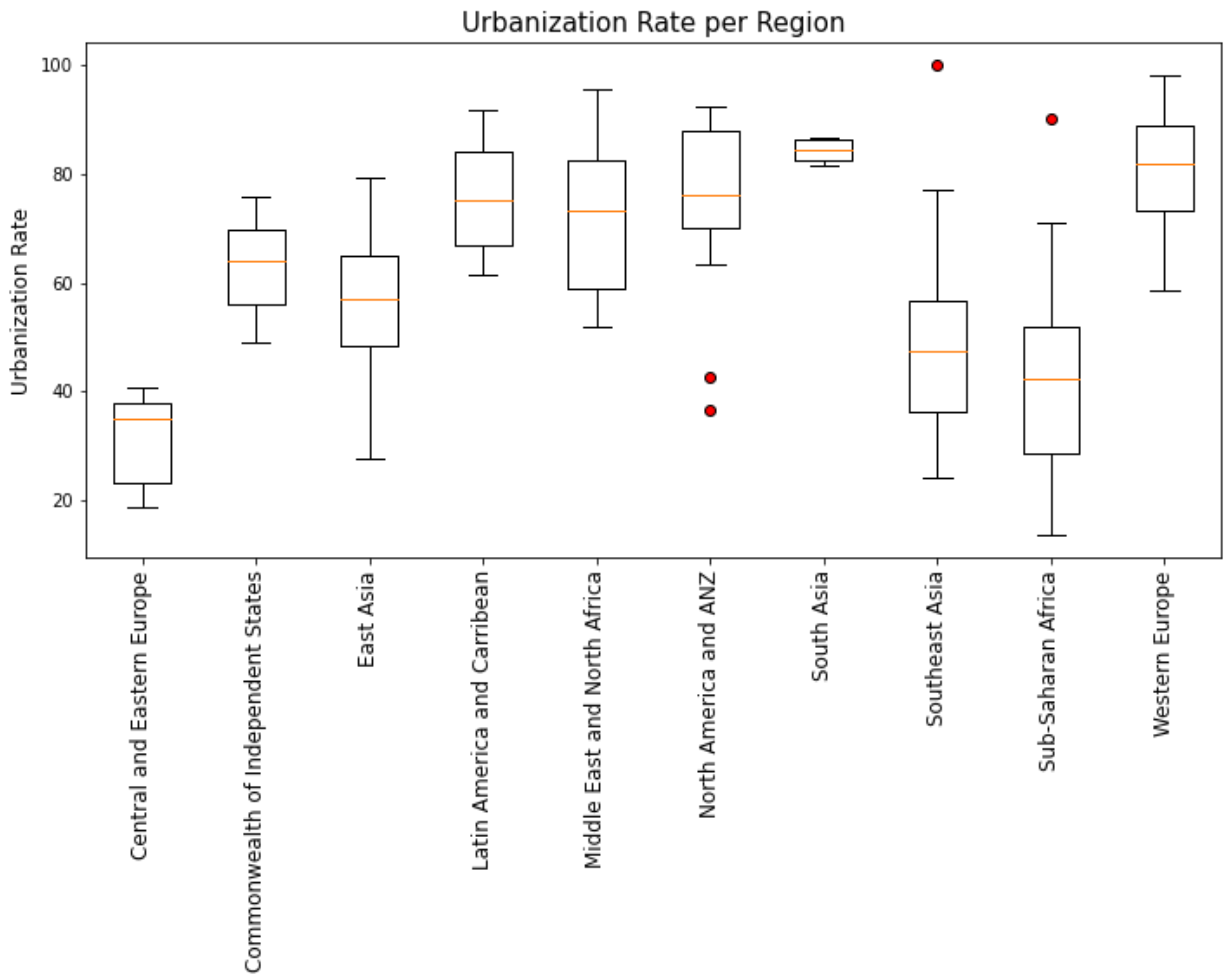
Boxplot for Happiness Score by Region

Only three regions have outliers in their boxplot for happiness score, which are Latin America and Caribbean, Central and Eastern Europe, and North America and ANZ. The region from left to right in the graph is also sorted by increasing average meat consumption. The mean of the happiness score increases from left to right, so it also shows that when meat consumption increases, the happiness score increases, too.



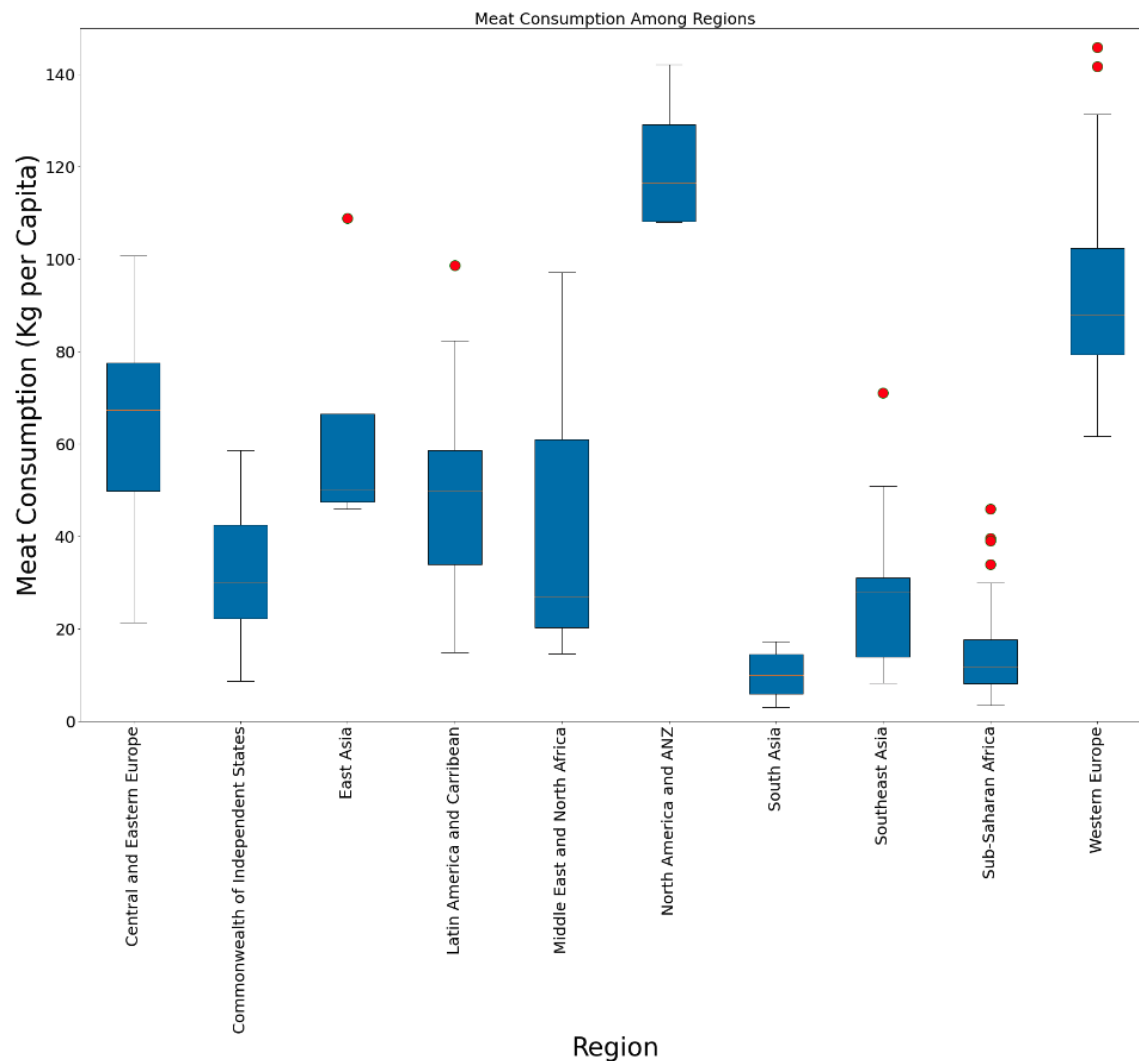
Boxplot for Urbanization Rate per Region

While the data overall does not contain outliers, when looking at various world regions, Middle East and North Africa, Southeast Asia, and Sub-saharan Africa have outlier data points, indicating a wider variation in urbanization rates regionally.



Boxplot for Meat Consumption Rate per Region

Each country was grouped within regions in order to analyze the differences in meat consumption among regions. The box plot indicates that there are several outliers within certain regions where meat consumption is greater than the overall average of the region including Sub-Saharan Africa, Southeast Asia, Latin America and Caribbean, and East Asia. Regions include diverse countries and these outliers could indicate cultural differences among the countries within as well as other factors that contribute to meat consumption. From this chart, we can see that North America, Australia and New Zealand (ANZ) have the highest levels of meat consumption, while South Asia and Sub-Saharan Africa have the lowest levels of meat consumption.



Boxplots by region summary:

When separated into regions, more outliers appear in the data than when grouped for the whole world.