

# SAS Project: World Happiness

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## Back ground:

The World Happiness study is a landmark survey of the state of global happiness that ranks 156 countries by how happy their citizens perceive themselves to be. There are 779 observation for the countries during the years 2015 to 2019. Dependent variable is happiness\_score which is a continuous variable and varies from 1 to 10. There are 10 numeric explanatory (independent) variables and Year variable to be used to determine how happy the citizens of each country are. Just countries' name and region are character. The rest of the variables are numeric.

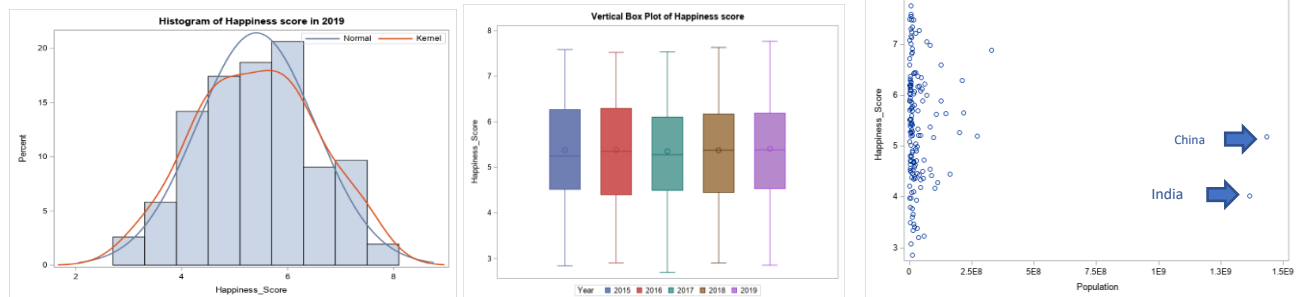
## Objective:

We would like to know: The factors that result in a country happiness? The change in happiness score from 2015 to 2019? Is the world getting happier?

## Technical Approach:

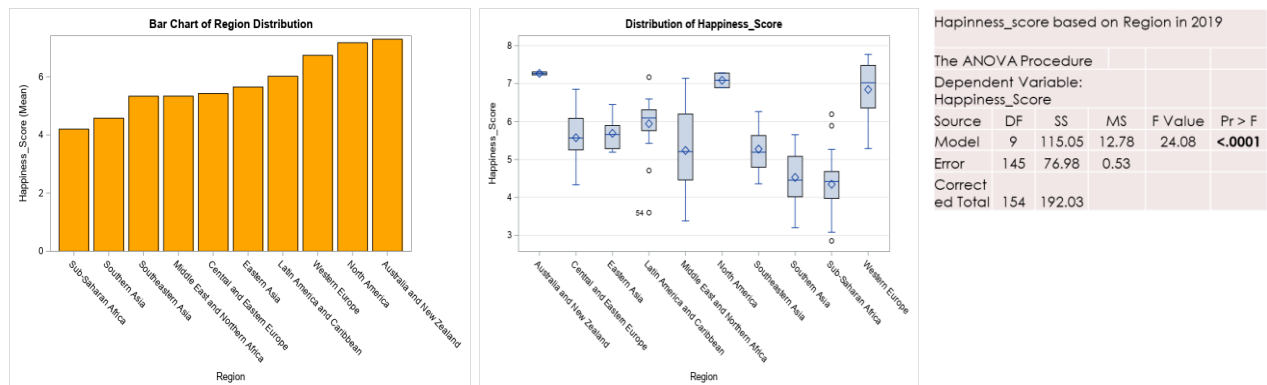
Descriptive Analysis: The distribution of happiness score is close to normal (5.4, 1.1), with less happy countries with a score about 2.5 and the happiest countries around 8.

The scatter plot shows that happiness is not associated with the county's population as the countries with small population can be eater less happy or the happiest.

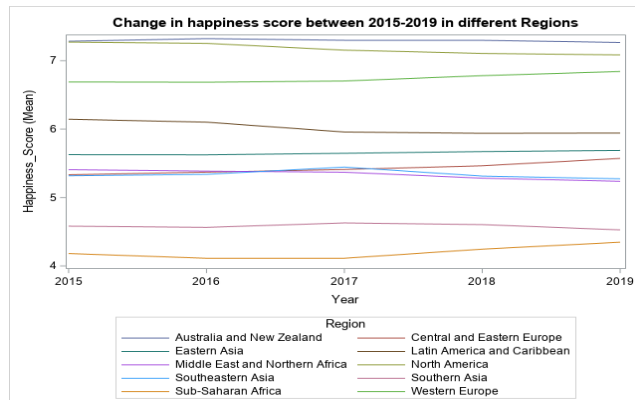


Australia and New Zealand are the happiest in the world. North America is next happiest part of the world. Sub-Saharan Africa and Southern Asia are the least happy.

ANOVA test shows there is difference between the average of happiness score in 2019 in different Regions of the world. Middle East has the most variation with the least and most happy people.



There is not much difference during the years 2015 to 2019 in the happiness score based on the Region. ANOVA test shows that Years in not a significant factor. There is no evidence of change in happiness score during 2015 to 2019 in any of the Regions.



Source	DF	Anova SS	MS	F Value	Pr > F
Year	4	0.231981	0.057995	0.11	0.9789
Region	9	605.2829	67.25366	128.07	<.0001
Year*Region	36	4.229103	0.117475	0.22	1

Correlation matrix shows: High positive linear correlation between Health and Life Expectancy. Positive linear correlation between Economy and Social\_support and Health. Some positive linear correlation between Trust and Freedom. There is small positive correlation between the Area and Density and clearly Population and Density are highly correlated.

Predictive Analysis: X variables are Area, Density, Economy, Social\_Support, Health, Freedom, Trust and Generosity. R-Square and adjusted R-Square of the model are 0.7932 and 0.7892 respectively. All the x variables are significant. But the coefficients for Area and Density are almost zero.

$$Y = 2.21 + 1.07 \text{ Economy} + 0.46 \text{ Social\_support} + 1.46 \text{ Health} + 1.35 \text{ Freedom} + 1.13 \text{ Trust} + 0.67 \text{ Generosity}$$

Source	DF	SS	MS	F Value	Pr > F
Model	8	448.15729	56.01966	198.51	<.0001
Error	414	116.83177	0.2822		
Corrected Total	422	564.98906			

## Conclusion:

There are many factors affecting the happiness of citizens of a country. Based on the political, natural or social changes, the happiness score may change as well.

Economy, Social\_Support, Health, Freedom, Trust and Generosity are positively related with Happiness\_score. The more they are, the happier is the country.

To predict Happiness score for years in future we need to have more data. This dataset only contains a period of 5 years between 2015 and 2019 and is not enough.

## Recommendation:

By improving Economy, people may be more Generous and by selecting better Governments and having more democracy, people may have more trust and freedom and by improving Social aspects of life, people may feel having more social support and be healthier and all these will result in a happier country.

