

The Pursuit of Happiness Factors

: What Factors Correlate More with Happiness?



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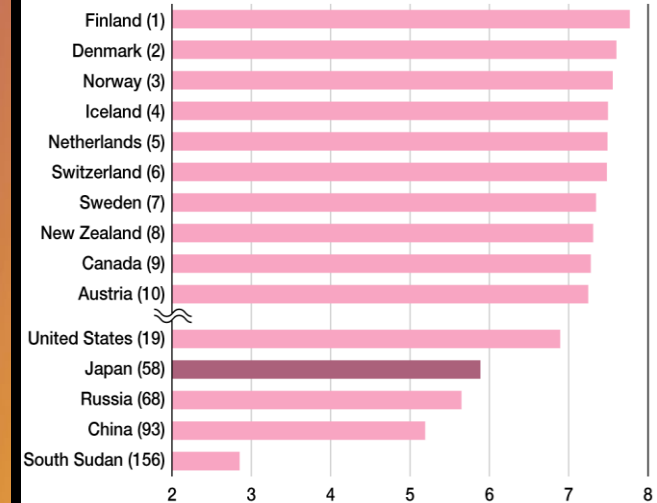
Motivation

- It all started with one report,
" *The World Happiness Report 2019* (Gallup)."
- Hmm.. Why some countries are happy and others are miserable? What factors correlate more with happiness?
- Wait, it's great for practicing what we've learned so far!

World Happiness Report 2019

MARCH 20, 2019
The World Happiness Report is a landmark survey of the state of global happiness that ranks 156 countries by how happy their citizens perceive themselves to be. This year's World Happiness Report focuses on happiness and the community: how happiness has evolved over the past dozen years, with a focus on the technologies, social norms, conflicts and government policies that have driven those changes.

2019 Ranking of Happiness by Country



Introduction

- 'The World Happiness Report' is a landmark survey of the state of global happiness that ranks **156 countries** by **how happy their citizens perceive themselves to be**.
- So, we tried to find important factors that are strongly correlated to the level of happiness among 11 indices:
 - 1) GDP per capita, 2) Healthy life expectancy,
 - 3) Social Support, 4) Freedom, 5) Generosity,
 - 6) Trust in government, 7) Unemployment Rate,
 - 8) Birth Rate, 9) Obesity Rate, 10) Population Density,
 - and 11) Weather
- "11 indices? Are you kidding?"
" Yeah.. They are Eleven.. And we did it!"

Data

"11 indices mean... Bunch of Data!!"

- Many websites were searched through....
: **Kaggle, WorldHappiness.report, CIA, Data.World, WorldBank, OECD, WorldEconomicForum, Gallup, etc**
- Three APIs utilized...
: **World Bank API, OpenWeatherMap API, Google Maps**
- As a result,
Roughly **30 csv files** were downloaded and created...!

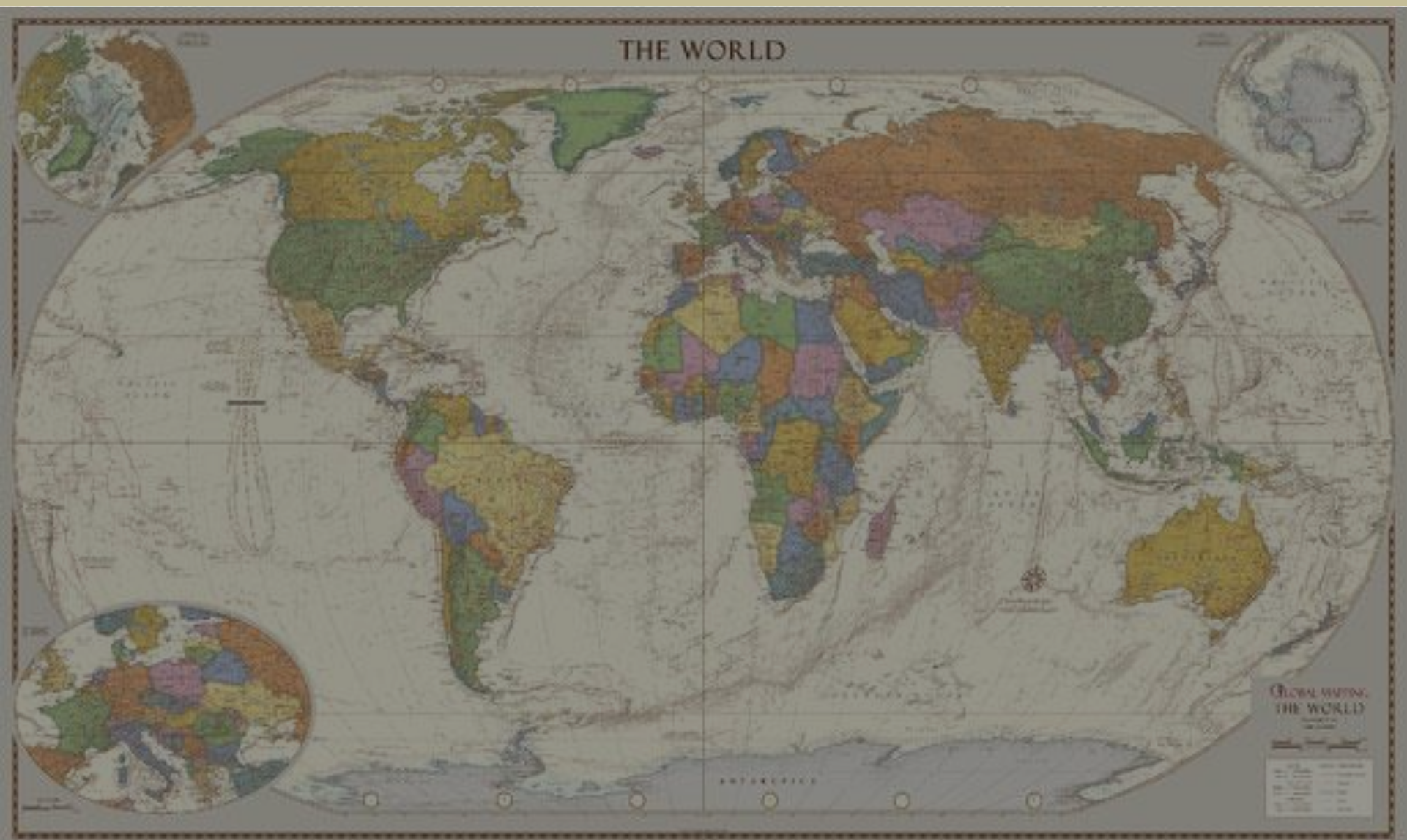
Data Clean Up & Exploration

- **Data Clean Up & Format**
: Pandas, Jupyter Notebook, Excel
- **Data Analysis**
: Matplotlib, SciPy, Numpy, Panda, Pandas.plotting
- **Visualization**
: Line Graph, Bar Graph, Pie Graph, Box Plot,
Scatter Plot, Scatter Matrix, Geographical Heatmap

Questions (contents)

- I** | What are the characteristics of 'Happy' vs. 'Miserable' Countries?
- II** | What 'Factors' Correlate More With the Level of Happiness?
- III** | Why and How are the 'Top Two Factors' Strongly Related to Happiness?

I. What are the Characteristics of 'Happy' vs. 'Miserable' Countries?



How 'Happy' Are You??

Rate your level of happiness from 1 to 10

Unhappy

Happy

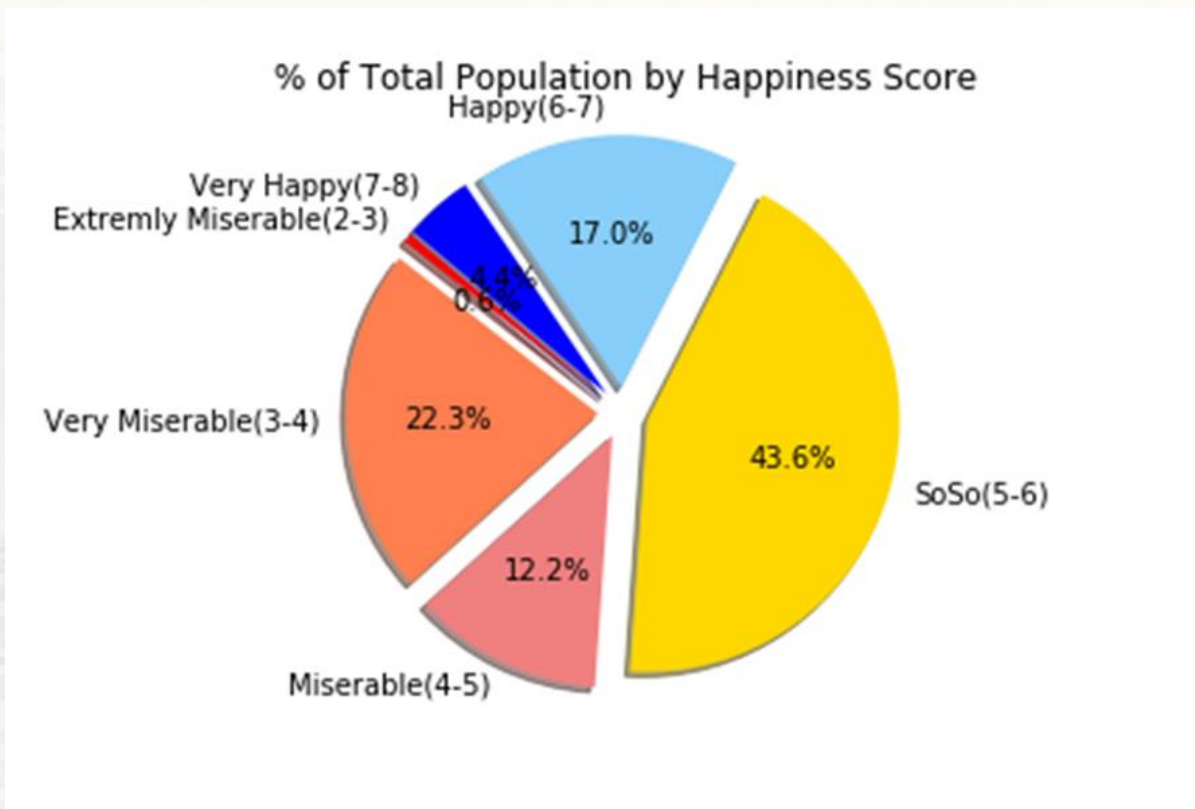
1 2 3 4 5 6 7 8 9 10

Happiness rating

What about the World?

Where do you belong?

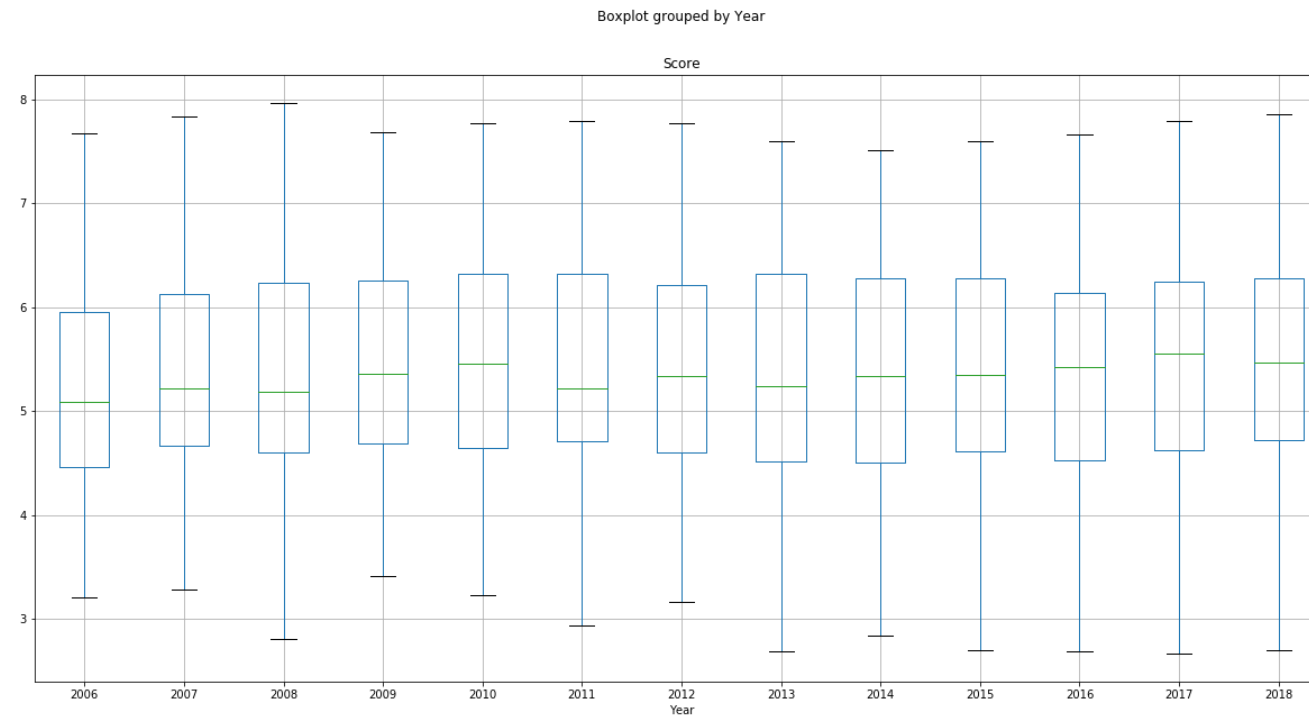
% of Total Population by Happiness Score



Global Happiness Trend

The overall happiness level hasn't changed a lot...

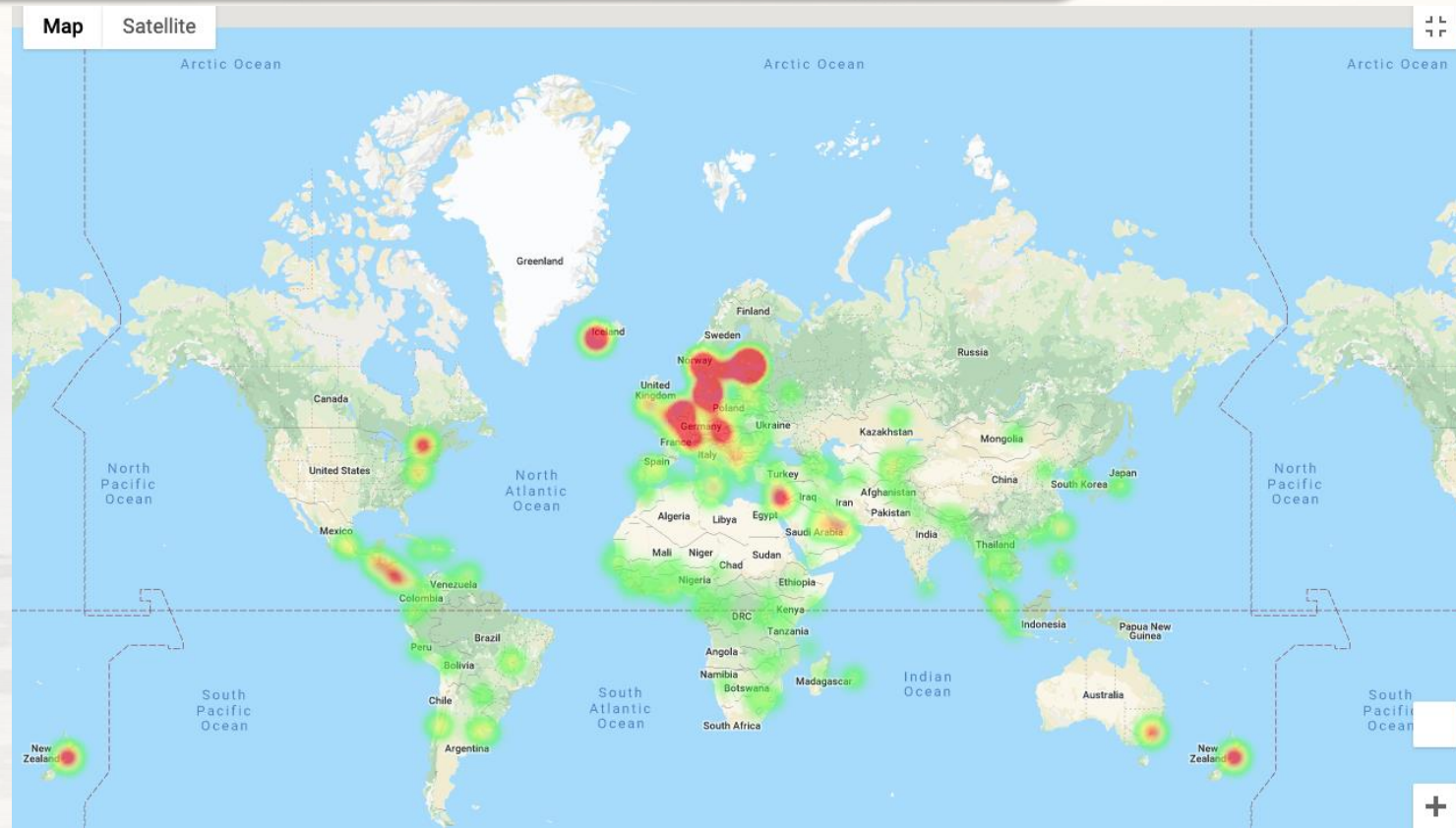
Happiness Scores Grouped by Year (2006 ~ 2018)



What are the 'Happiest' Countries?

The Lucky Ones are Finland, Denmark, Norway, Iceland, Netherlands, Switzerland, Sweden, New Zealand, Canada, Austria, Australia, Costa Rica...

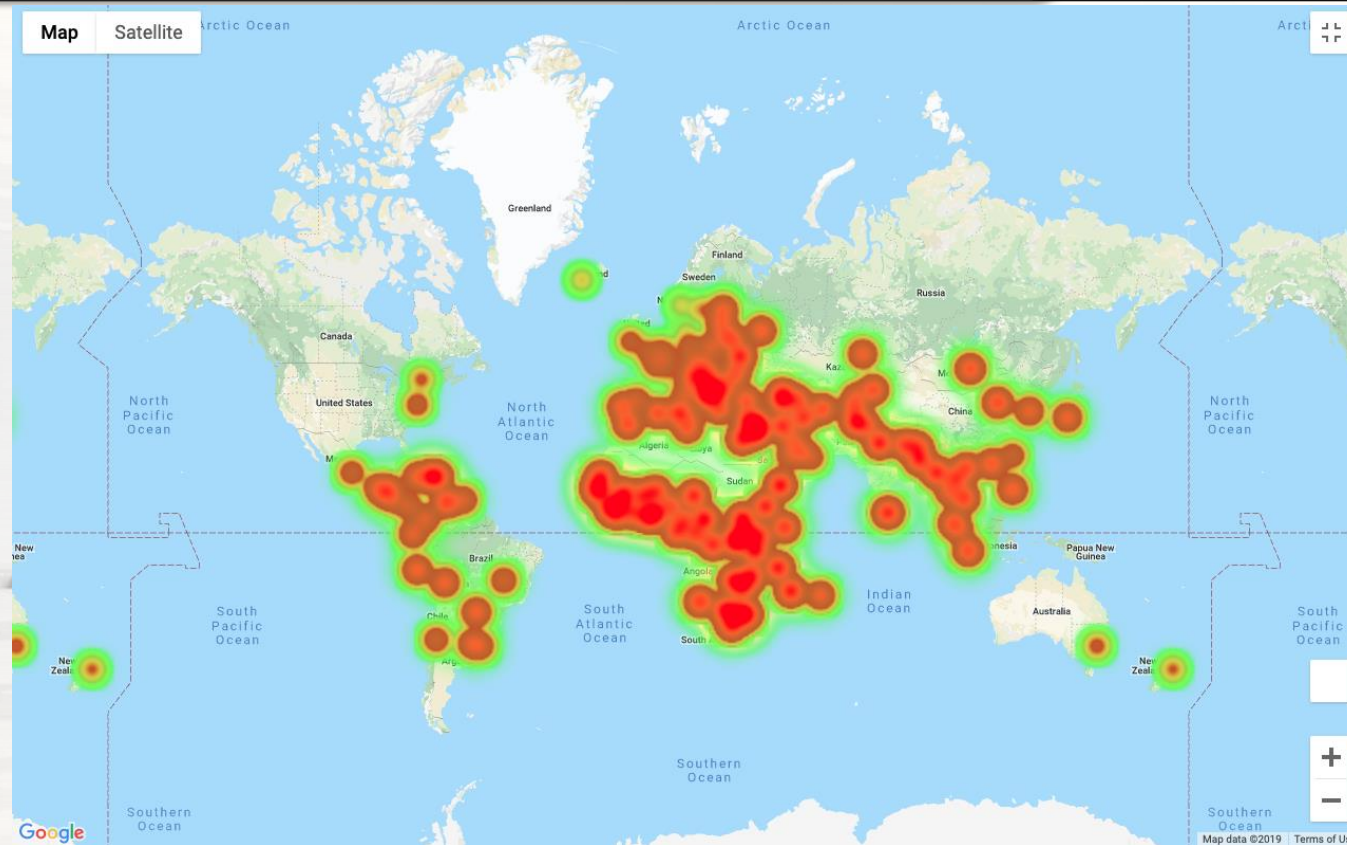
Happiest Countries in the World



What are the most 'Miserable' Countries?

They are South Sudan, Central African Republic, Afghanistan, Tanzania, Rwanda, Yemen, Malawi, Syria, Botswana, Haiti, Zimbabwe, Brunei...

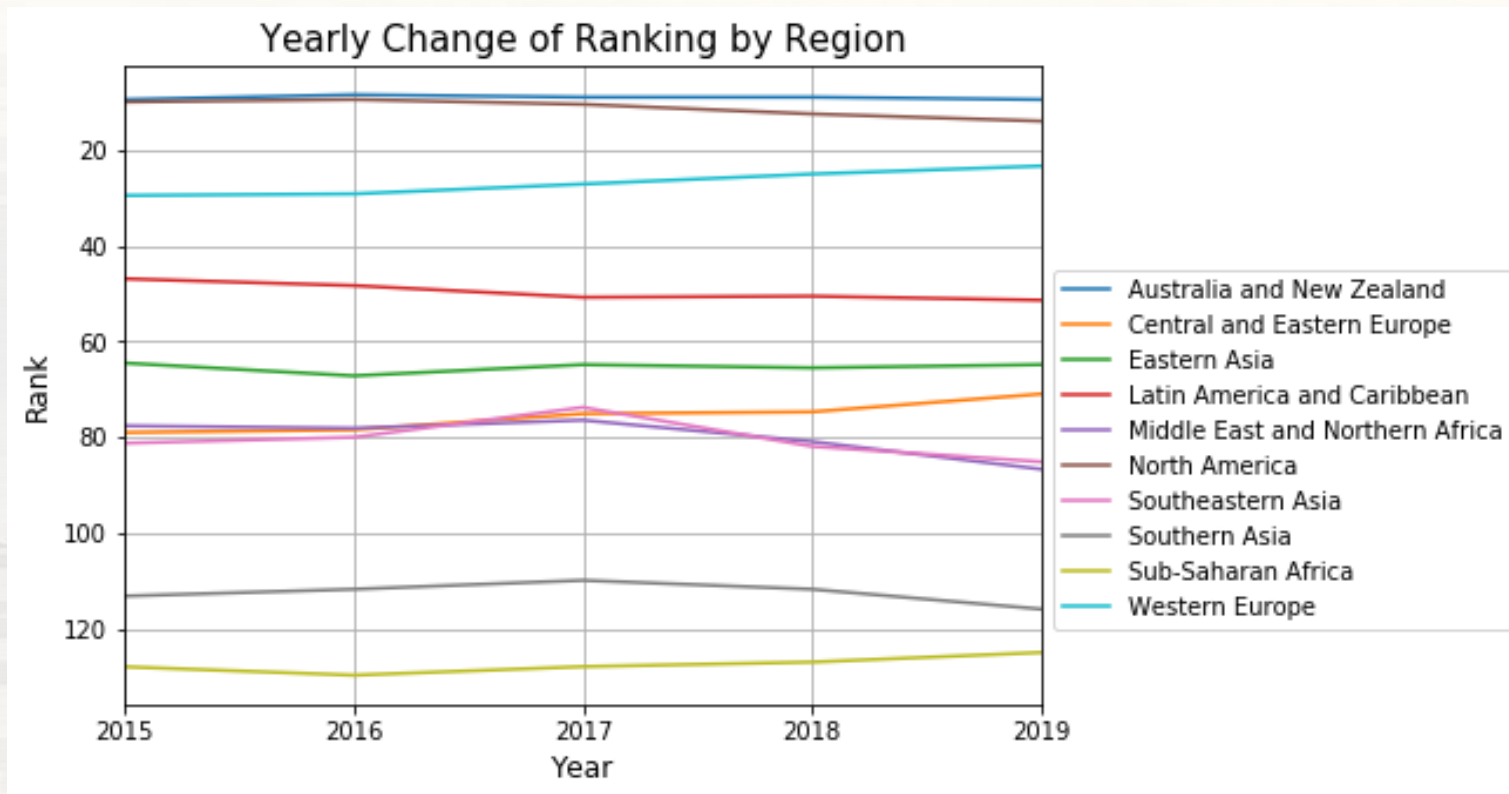
Most Miserable Countries in the World



Regional Trend

But, Look at all the differences by region!

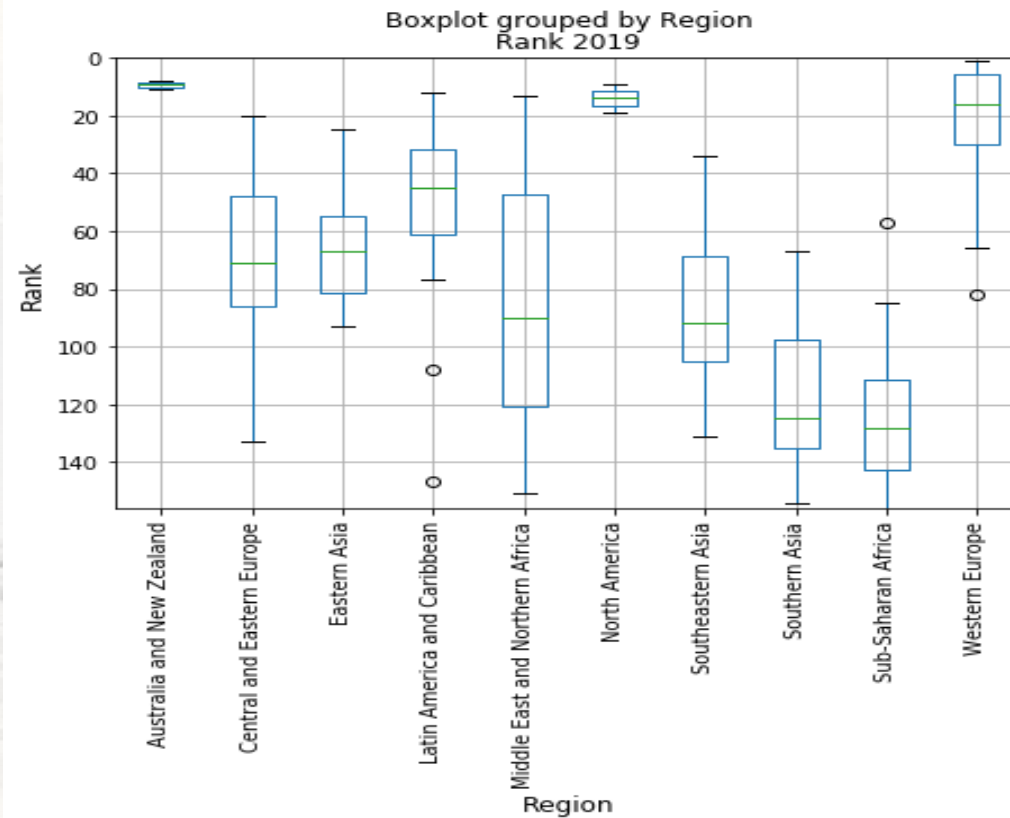
Yearly Change of Ranks by Region



Regional Variance in 2019

Variances also differ by region!

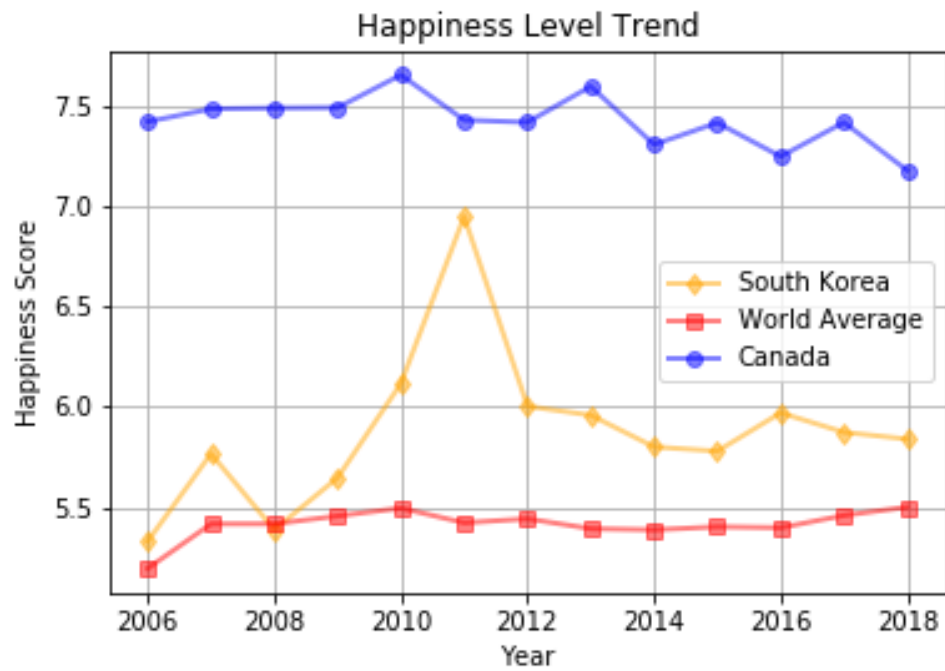
Boxplot Grouped by Region Rank 2019



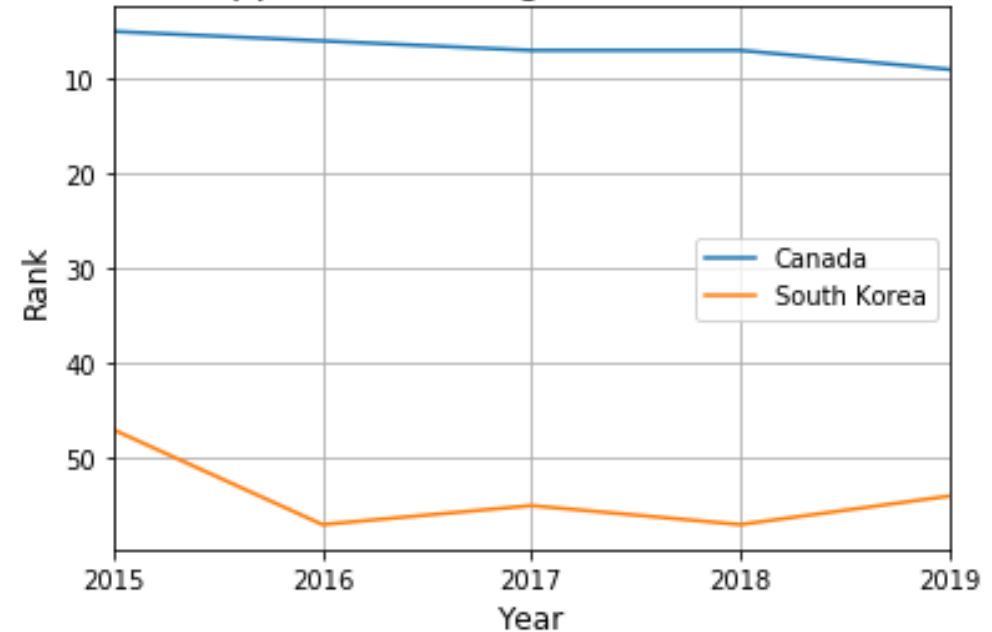
Any Specific Interest?

Want to know more about each country?

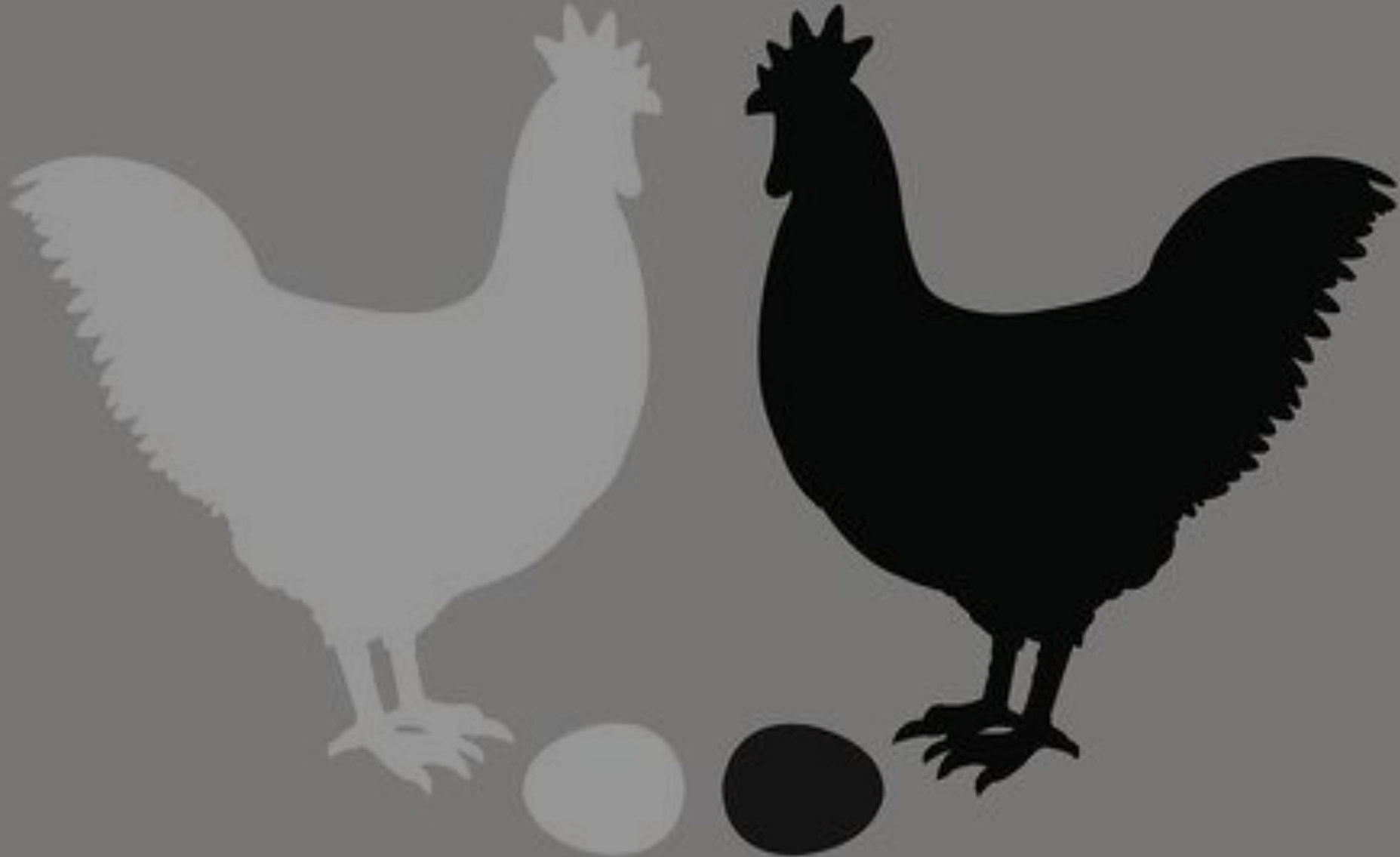
Happiness Level Trend of Canada and South Korea



Historical Happiness Ranking of Canada and South Korea



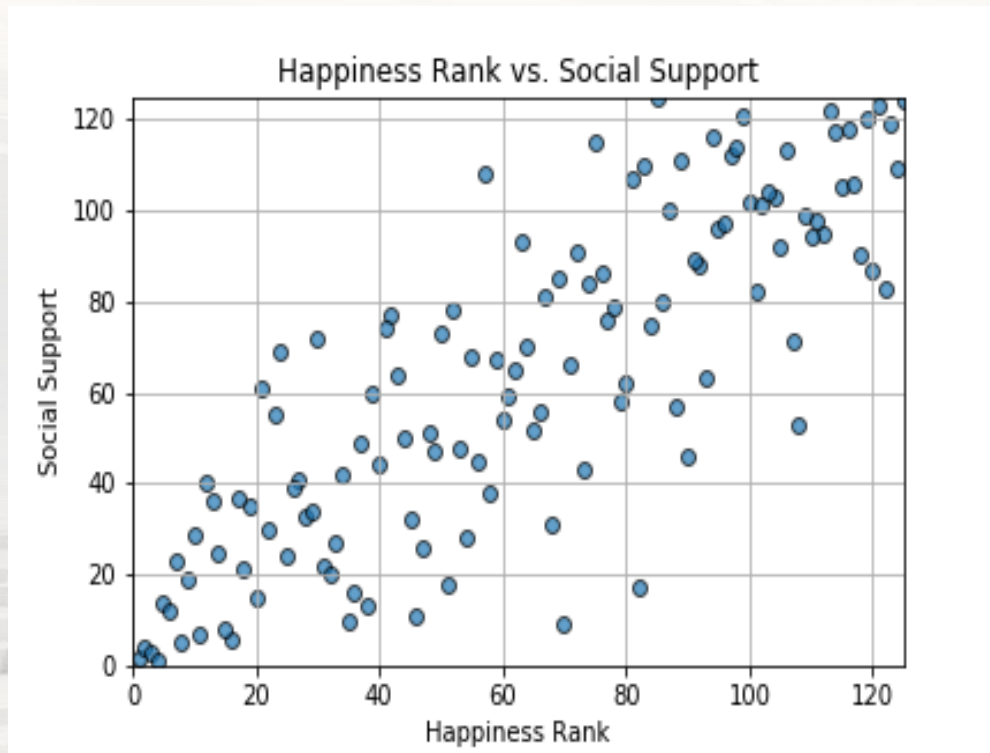
II. What ‘Factors’ Correlate More With the Level of Happiness?



Factor Correlation Analysis

As seen below, Social Support and Life Expectancy are highly correlated with Happiness

1) Social Support



2) Healthy Life Expectancy



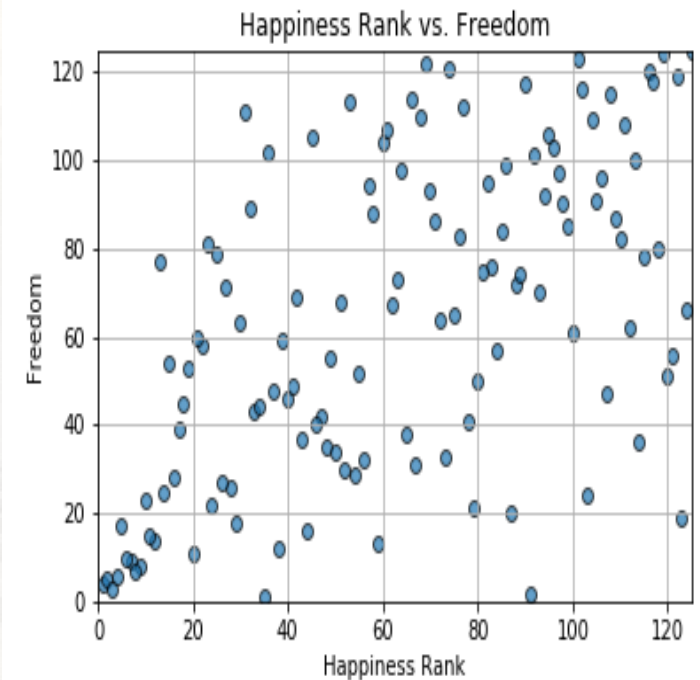
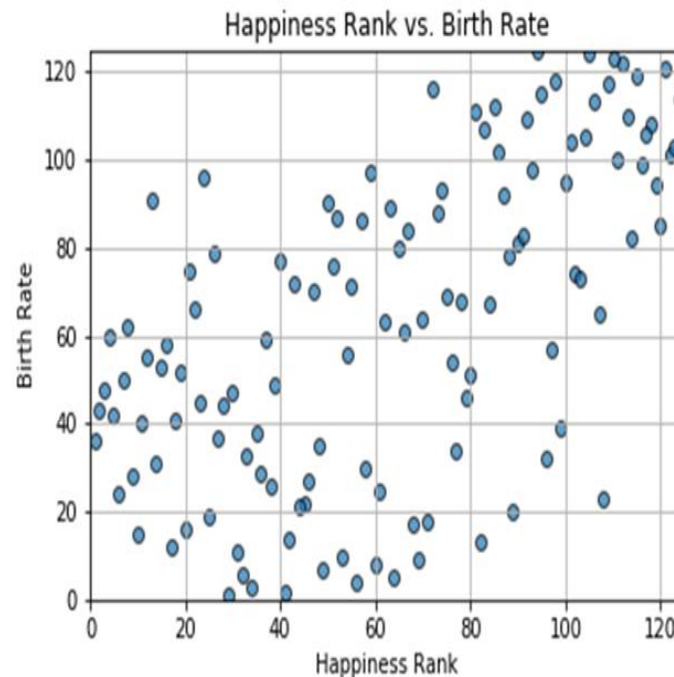
Factor Correlation Analysis

GDP, Birth Rate, and Freedom are somewhat correlated with Happiness

3) GDP per Capita

4) Birth Rate

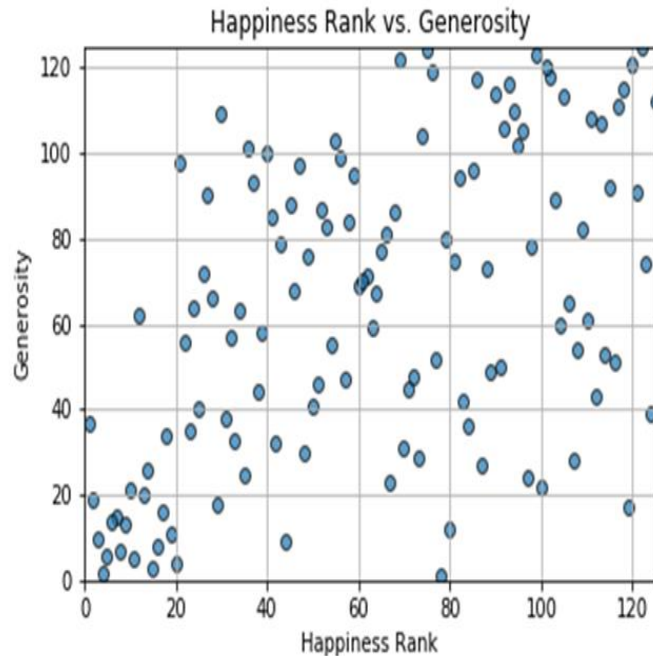
5) Freedom



Factor Correlation Analysis

Generosity, Obesity, Unemployment are only mildly correlated with Happiness

6) Generosity



7) Obesity Rate



8) Unemployment Rate



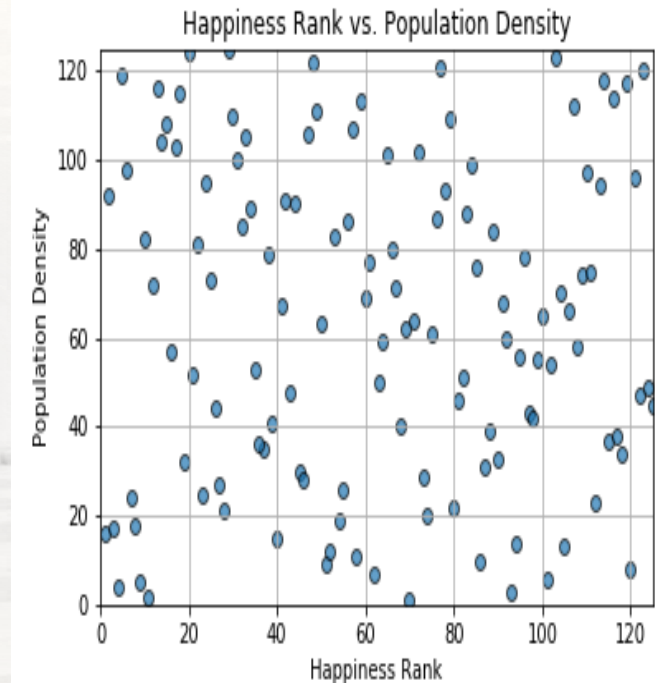
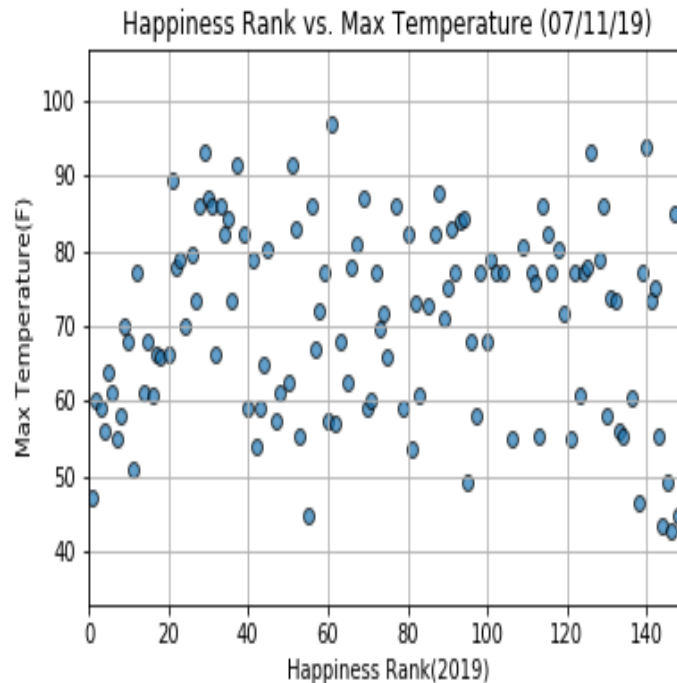
Factor Correlation Analysis

Obviously, Thanos is wrong!! Look at the Population Density!

9) Trust in Government

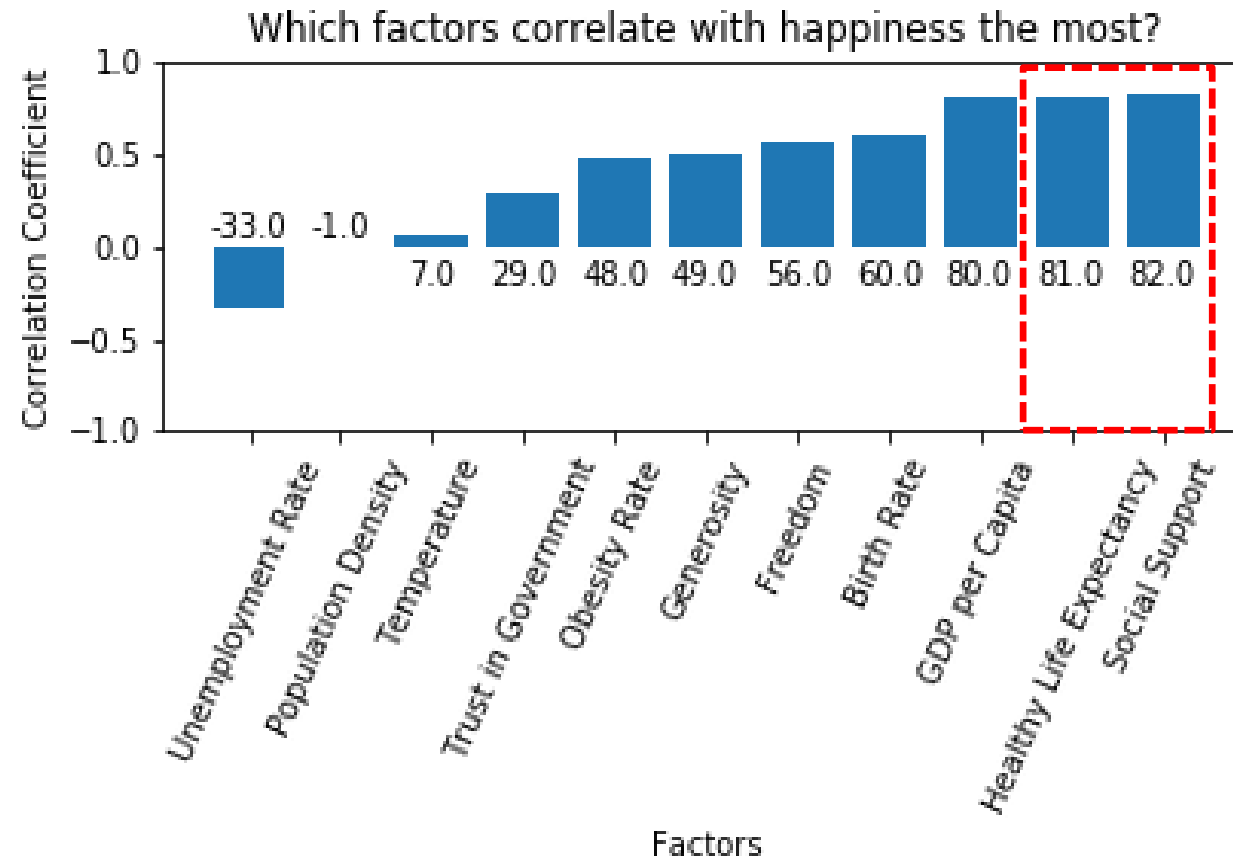
10) Temperature

11) Population Density



Correlation Coefficient Summary

Tada! Here come all the numbers!



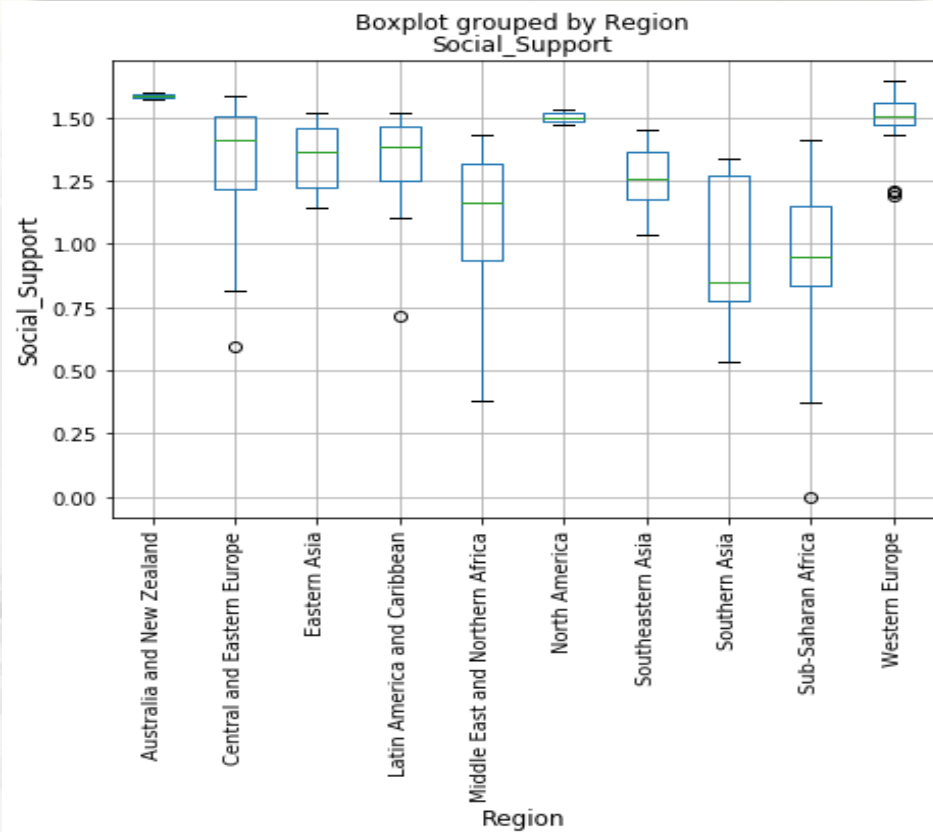
III. Why and How are the ‘Top Two Factors’ Strongly Related to Happiness?



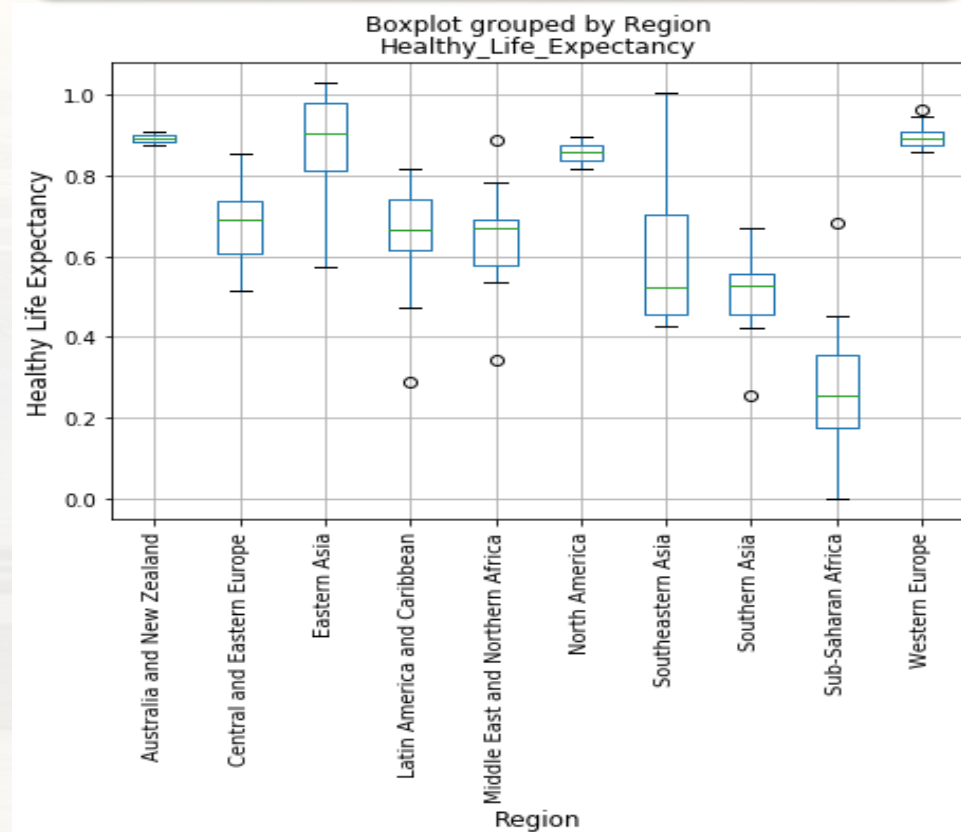
Delving into the Top Two

Just as the regional variance in happiness ranks, the top two factors show similar variances.

Social Support by Region (2018)



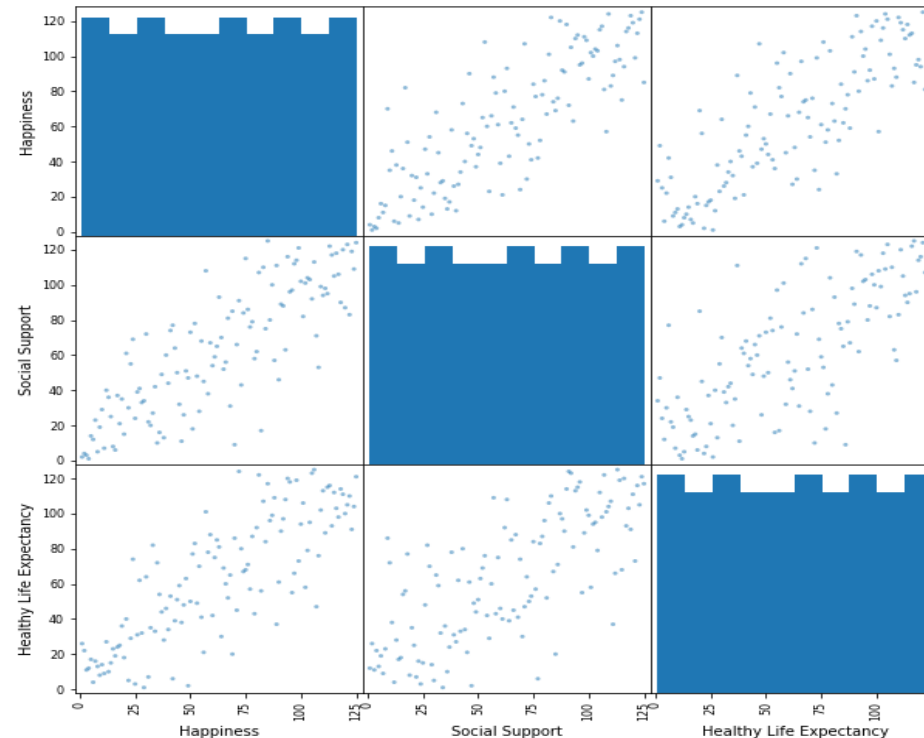
Life Expectancy by Region (2018)



Putting Them Altogether

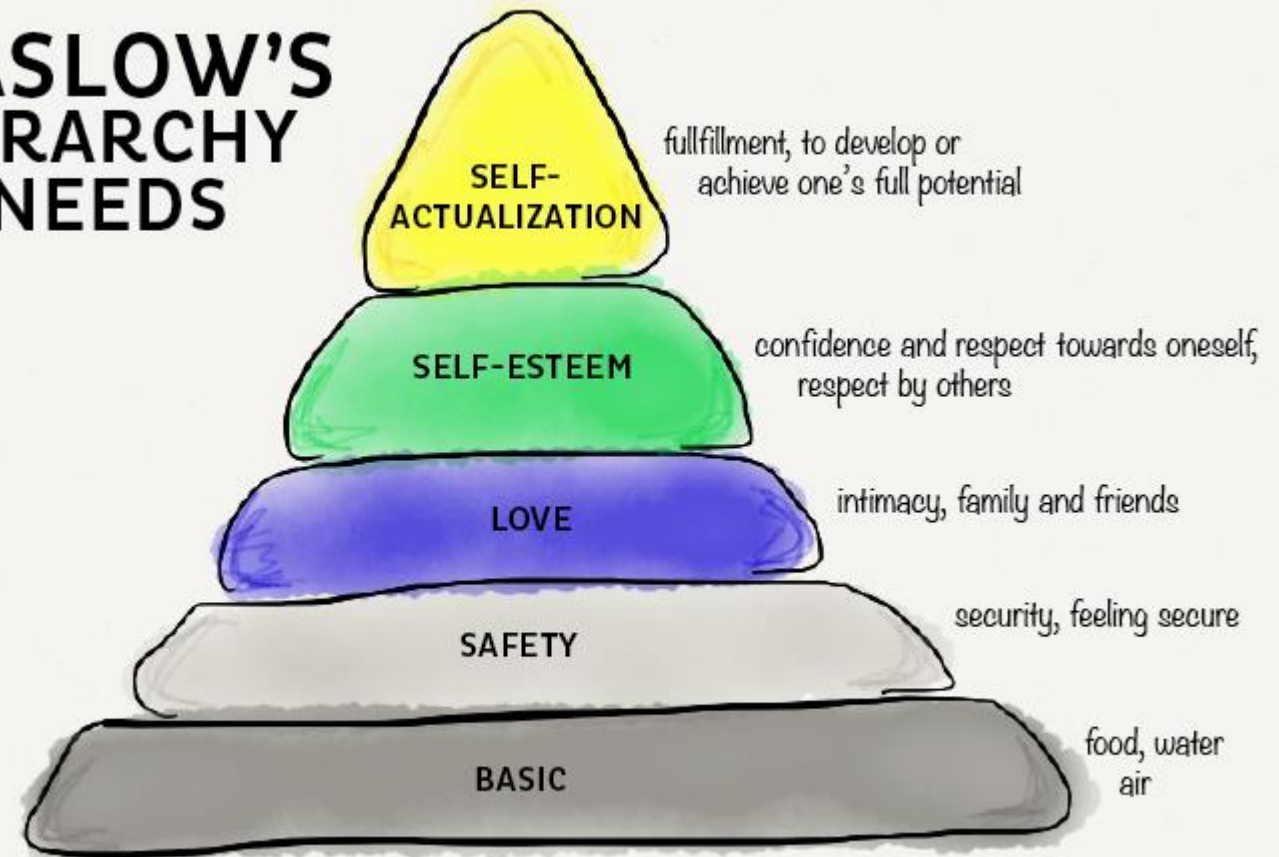
The top two factors and happiness itself are strongly correlated with each other!

Scatter Matrix (Happiness, Social Support, and Life Expectancy)



Food for thought...

MASLOW'S HIERARCHY OF NEEDS





Questions?

Thank you!