The Happiness Factor

*A glimpse at 'happiness' values across
the globe, analysis of the World Happiness Report
from 2015-2019*

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Motivations for initial analysis

Define and visualize happiness across the world during the period 2015-2019, according to the World Gallup Poll.

Utilize python tools and libraries to explore any hidden correlations between variables and find out which countries/regions were the happiest

Datasets

World Happiness Report data, 2015-2019 (Kaggle)

Country coordinates .csv (Google)

World Happiness Variables

"Happiness Score"

"Family" - perceived level of social support from family & friends

"Health" - healthy life expectancy at birth (from WHO data)

"Freedom" - satisfaction with their freedom to choose what to do with their life

"Generosity" - have they donated to charity in the past month

"Trust" - perception of corruption in government/institutions

GDP - World Bank data

Questions for Analysis

- What are the happiest countries? Least happy?
- How is happiness distributed across the world, are there any regional differences in happiness level?
- Top 10 change across time
- Correlations and linear regression
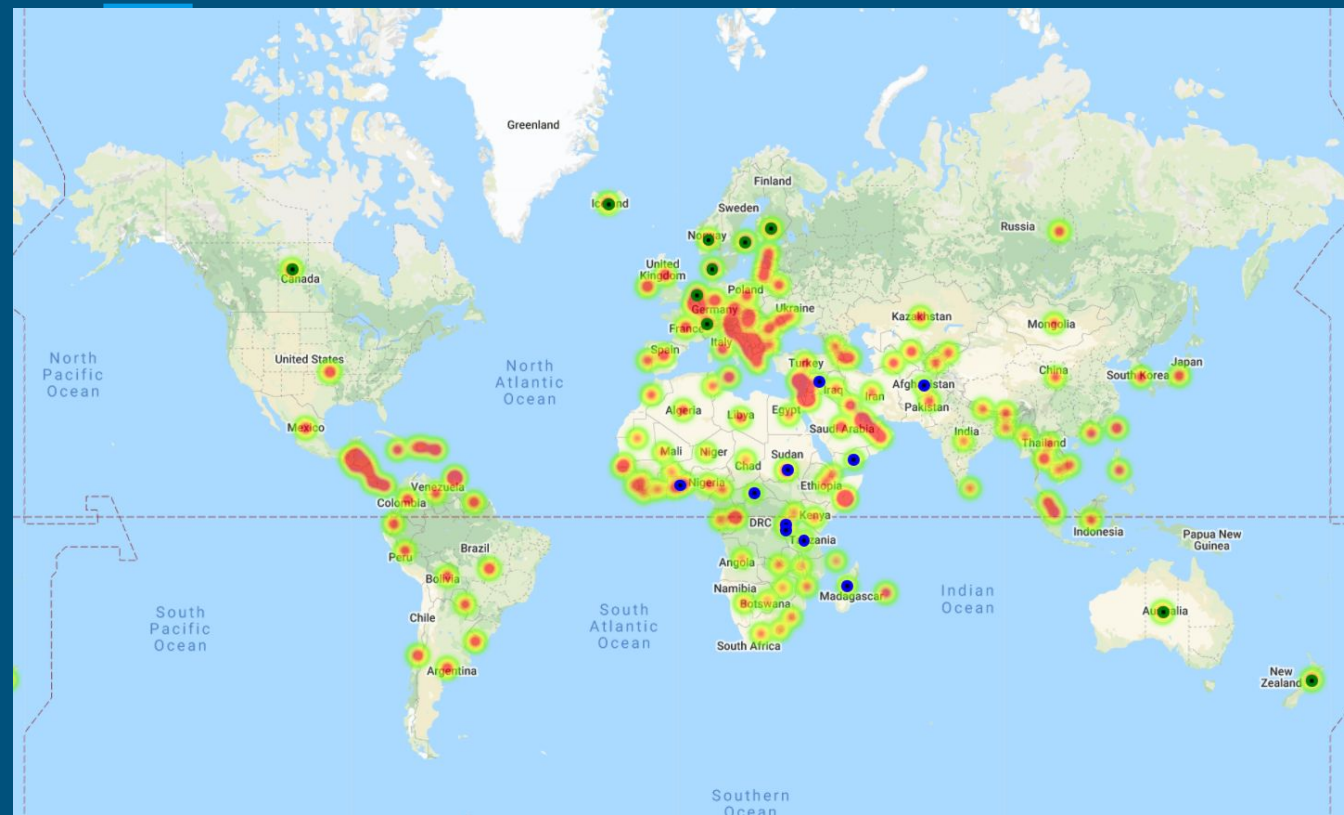
Data cleanup & exploration

Coordinates

Country spelling

Region name differences, missing values

Missing "dystopia residual" for two years' data

Countries may not have participated every year

Country Happiness Heatmap

Top Ten (Green)

	Region	Country
0	Western Europe	Denmark
1	Western Europe	Norway
2	Western Europe	Finland
3	Western Europe	Switzerland
4	Western Europe	Iceland
5	Western Europe	Netherlands
6	North America	Canada
7	Western Europe	Sweden
8	Australia and New Zealand	New Zealand
9	Australia and New Zealand	Australia

Bottom Ten (Blue)

	Region	Country
0	Sub-Saharan Africa	Madagascar
1	Middle East and Northern Africa	Yemen
2	Sub-Saharan Africa	Togo
3	Southern Asia	Afghanistan
4	Sub-Saharan Africa	Tanzania
5	Sub-Saharan Africa	Rwanda
6	Sub-Saharan Africa	South Sudan
7	Middle East and Northern Africa	Syria
8	Sub-Saharan Africa	Central African Republic
9	Sub-Saharan Africa	Burundi

Correlation Matrix

Allows us to see all correlations in one plot (Seaborn)
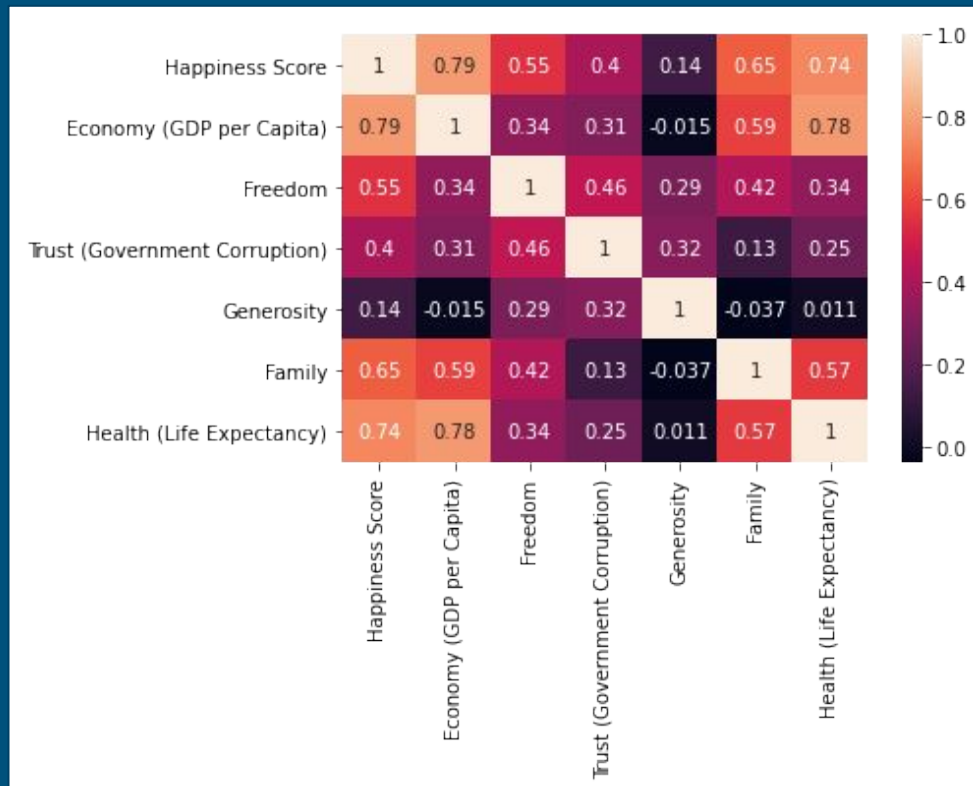
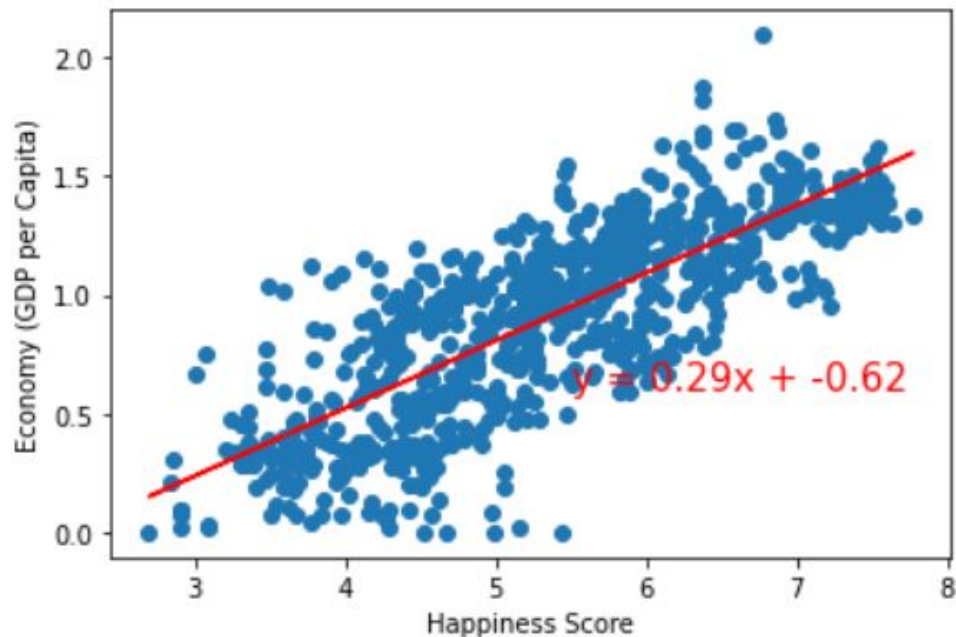# GDP vs. Happiness Score

r = .79

(moderately strong positive)

Rsquared = .62

(62% of the variance accounted for by the linear regression model)

r value is: 0.7892839967173202
r squared value is: 0.6229692274740667

y = 0.29x + -0.62
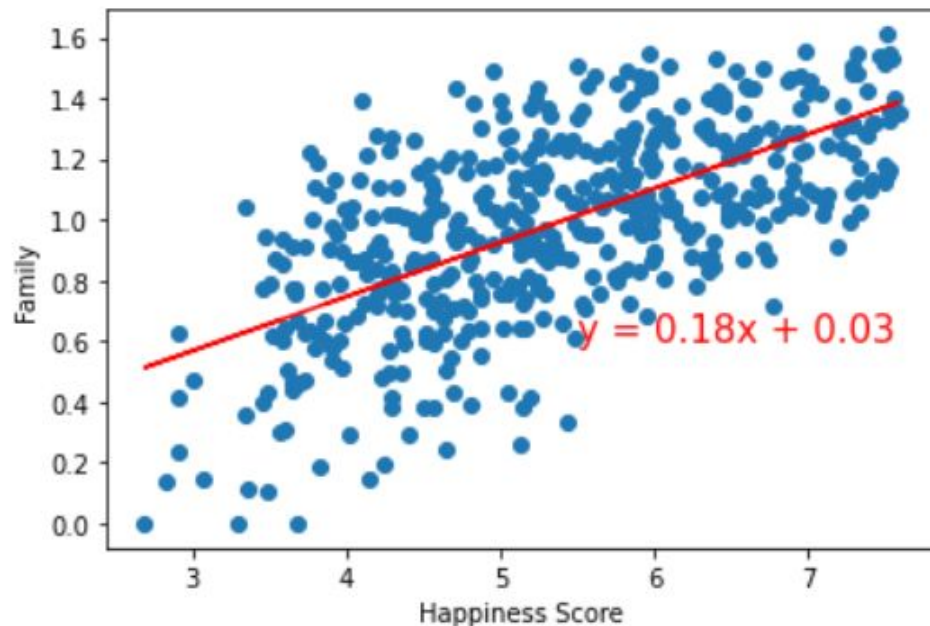
"Family" vs. Happiness Score

r = .64

(moderate positive)

Rsquared = .41

(41% of the variance accounted for by the linear regression model)

r value is: 0.6365319620015423
r squared value is: 0.40517293864953285

$y = 0.18x + 0.03$

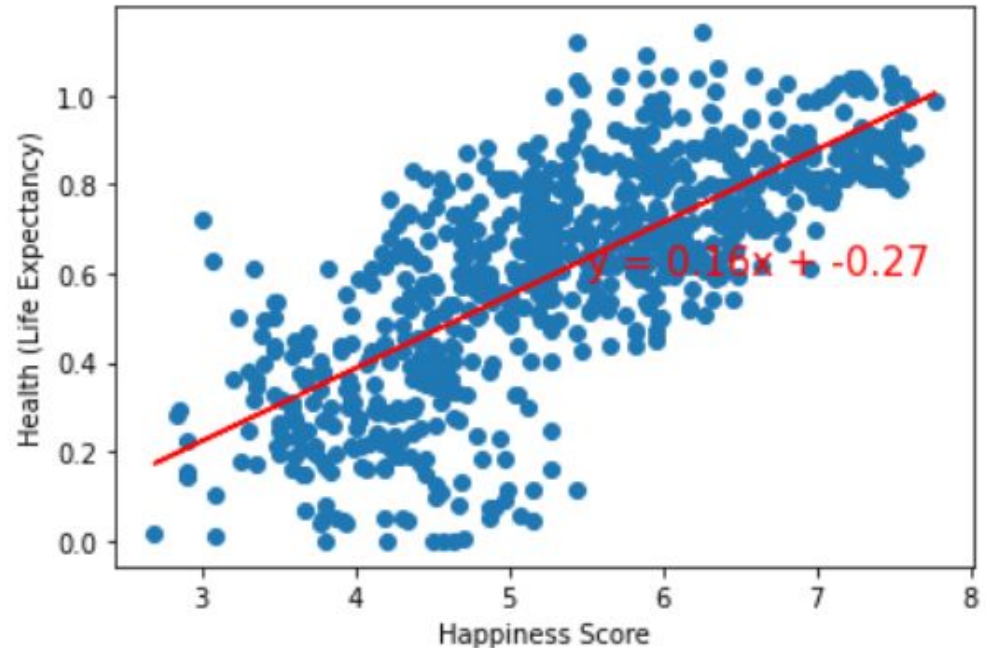# Health (Life Expectancy) vs. Happiness Score

r = .74

(moderately strong positive)

Rsquared = .55

(55% of the variance accounted for by the linear regression model)

r value is: 0.7424557422153406
r squared value is: 0.5512405291485323

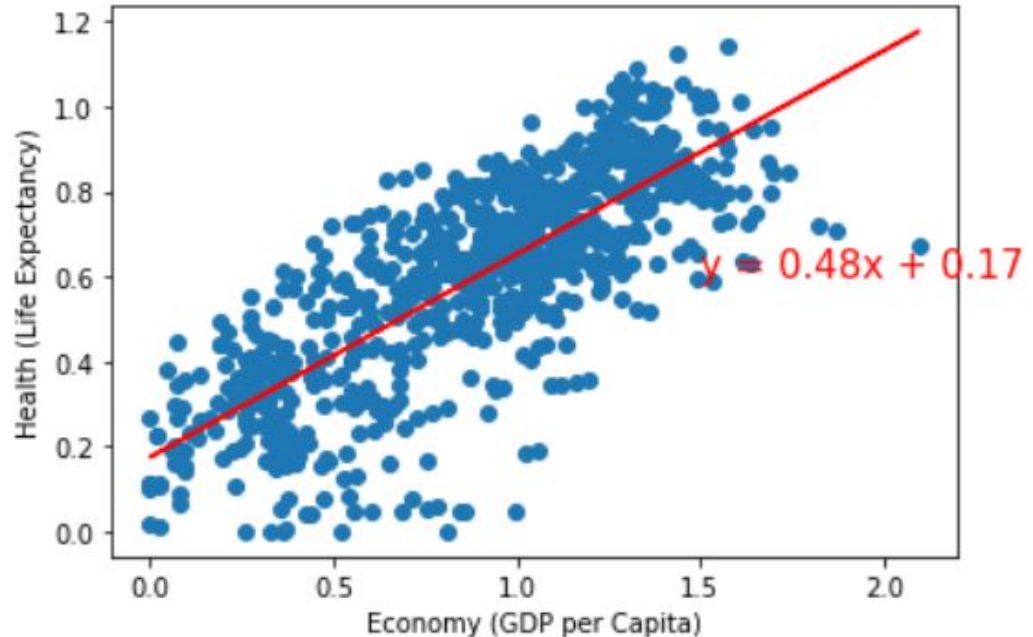# Health (Life Expectancy) vs. GDP

r = .78

(moderately strong positive)

Rsquared = .62

(62% of the variance accounted for by the linear regression model)

Regional Happiness Scores per Year

Region	Year	Happiness Score
Australia and New Zealand	2015.0	7.285000
North America	2015.0	7.273000
Western Europe	2015.0	6.689619
Latin America and Caribbean	2015.0	6.144682
Eastern Asia	2015.0	5.626167
Middle East and Northern Africa	2015.0	5.406900
Central and Eastern Europe	2015.0	5.332931
Southeastern Asia	2015.0	5.317444
Southern Asia	2015.0	4.580857
Sub-Saharan Africa	2015.0	4.202800

Region	Year	Happiness Score
Australia and New Zealand	2016.0	7.323500
North America	2016.0	7.254000
Western Europe	2016.0	6.685667
Latin America and Caribbean	2016.0	6.101750
Eastern Asia	2016.0	5.624167
Middle East and Northern Africa	2016.0	5.386053
Central and Eastern Europe	2016.0	5.370690
Southeastern Asia	2016.0	5.338889
Southern Asia	2016.0	4.563286
Sub-Saharan Africa	2016.0	4.136421

Region	Year	Happiness Score
Australia and New Zealand	2017.0	7.299000
North America	2017.0	7.154500
Western Europe	2017.0	6.703714
Latin America and Caribbean	2017.0	5.957818
Eastern Asia	2017.0	5.646667
Southeastern Asia	2017.0	5.444875
Central and Eastern Europe	2017.0	5.409931
Middle East and Northern Africa	2017.0	5.369684
Southern Asia	2017.0	4.628429
Sub-Saharan Africa	2017.0	4.111949

Region	Year	Happiness Score
Australia and New Zealand	2018.0	7.298000
North America	2018.0	7.107000
Western Europe	2018.0	6.781762
Latin America and Caribbean	2018.0	5.938619
Eastern Asia	2018.0	5.672000
Central and Eastern Europe	2018.0	5.463966
Southeastern Asia	2018.0	5.313444
Middle East and Northern Africa	2018.0	5.282737
Southern Asia	2018.0	4.603857
Sub-Saharan Africa	2018.0	4.244950

Region	Year	Happiness Score
Australia and New Zealand	2019.0	7.267500
North America	2019.0	7.085000
Western Europe	2019.0	6.770909
Latin America and Caribbean	2019.0	5.942550
Eastern Asia	2019.0	5.688833
Central and Eastern Europe	2019.0	5.571786
Southeastern Asia	2019.0	5.273667
Middle East and Northern Africa	2019.0	5.237000
Southern Asia	2019.0	4.526857
Sub-Saharan Africa	2019.0	4.346195

Country Count for each region (2019)
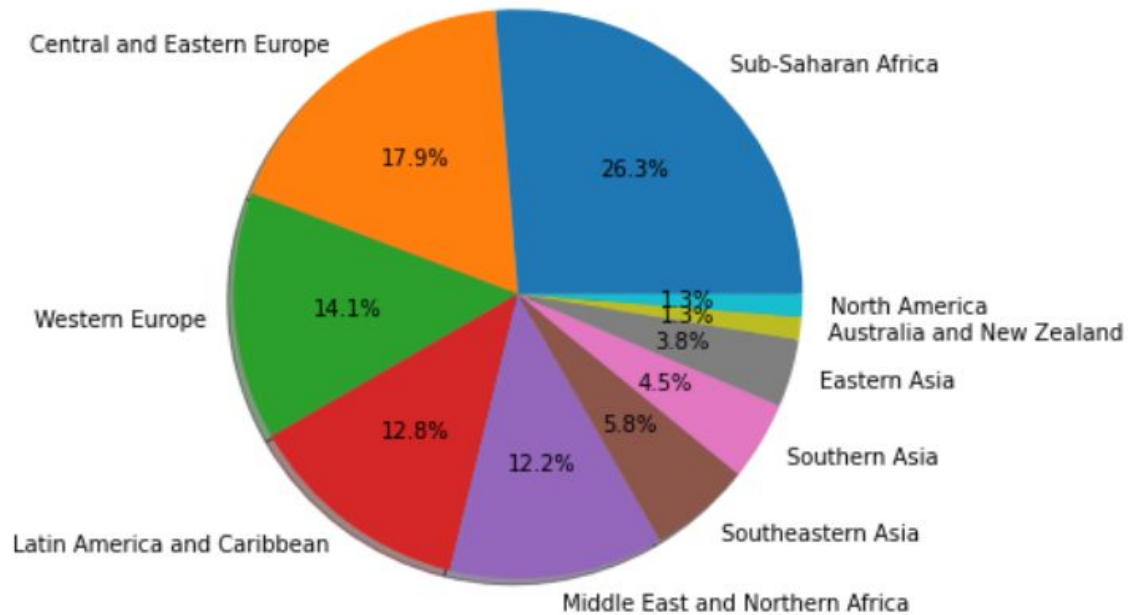
Discuss Findings

The happiest remained the happiest countries

- 6-7 out of 10 of the happiest countries were in Western Europe

The following comparisons showed strong positive correlations:

GDP vs. Happiness Score (r = .79)

Health (Life Expectancy) vs. Happiness Score (r = .74)

Health (Life Expectancy) vs. GDP (r = .78)

Several variables had stronger correlations for Top 10 vs Bottom 10 countries

Conclusion and Future Possibilities

Potential confounds:

- Limited scope of Analysis
- Missing data, countries not reported
- Country Count for each region

Future Directions and Possibilities:

- Breakdown of all 50 US States
- Include 2020 and 2021 data
- Utilize other Census measures since we have Country + Coordinates
- Machine Learning & Modeling