Project Proposal

Project Goal: We are analyzing what makes the world happy and if the traditional features actually contribute to a country's happiness. By analyzing these, we hope to find the most important happiness features.

Team:
1. Khushnaseeb Ali - kk3521
2. Mayank Grover - mg5229
3. Srinath Chandrasekhar - sc6637

Datasets:
1. https://www.kaggle.com/unsdsn/world-happiness/home
2. http://www.transparency.org/cpi2016
3. https://ourworldindata.org/substance-use
4. http://databank.worldbank.org

Dataset Attributes:

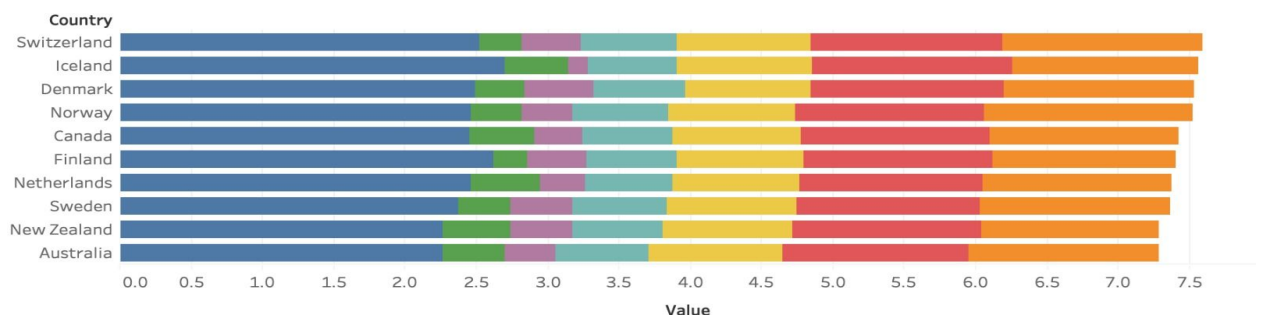| Attribute	Type	Values	Range
Country	Categorical	India, USA, Canada etc.	
Happiness Rank	Ordinal	1,2,3 ...etc	1-158
Happiness Score	Quantitative	7.52, 7.49, 7.41 etc	0-10
Economy (GDP per Capita)	Quantitative	1.44, 1.52, 1.42 etc	0-1.87
Trust(Government Corruption)	Quantitative	0.44, 0.41, 0.39 etc	0-0.46
Health (Life expectancy)	Quantitative	0.79, 0.86, 0.81 etc	0-0.95
Family (the extent to which family contributes)	Quantitative	1.16, 1.14, 1.18 etc	0-1.81
Freedom	Quantitative	0.57, 0.56, 0.59 etc	0-0.66
Generosity	Quantitative	0.36, 0.28, 0.47	0-0.84

Questions and Tasks:

1. **Question:** Which factors affect the Happiness Index?
   Task: Finding how the increase/decrease in certain factors affects the happiness score.
2. **Question:** Which countries are the happiest / least happy and how that changes over time?
   Task: Figuring out the trend/pattern in the happiness score/rank for various countries over the last few years.
3. **Question:** Is industrialization somehow related to happiness?
   Task: Finding out if economic factors like GDP per capita have an impact on the happiness score.
4. **Question:** Is health related to happiness score?
   Task: Finding out if countries with higher life expectancy have a high happiness index or vice versa.
5. **Question:** Does corruption within the country has a relation to the happiness index?
   Task: Finding out if the countries with a higher trust have a higher happiness score.

Story Design

Data Analysis

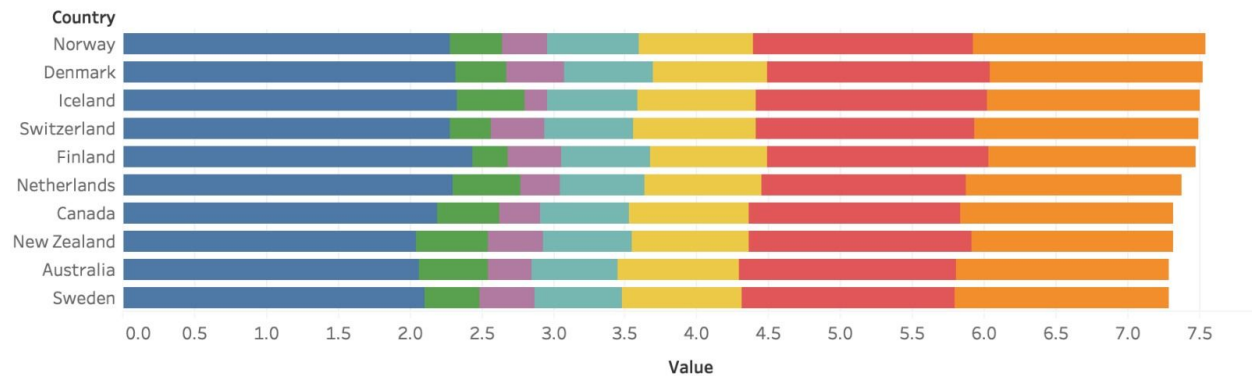1. Top 10 happiest countries.

Dystopia Residual, Economy (GDP per Capita), Family, Health (Life Expectancy), Freedom, Generosity and Trust (Government Corruption) for each Country. Color shows details about Dystopia Residual, Economy (GDP per Capita), Family, Health (Life Expectancy), Freedom, Generosity and Trust (Government Corruption). The data is filtered on Year, which keeps 2015. The view is filtered on Country, which keeps 10 of 148 members.
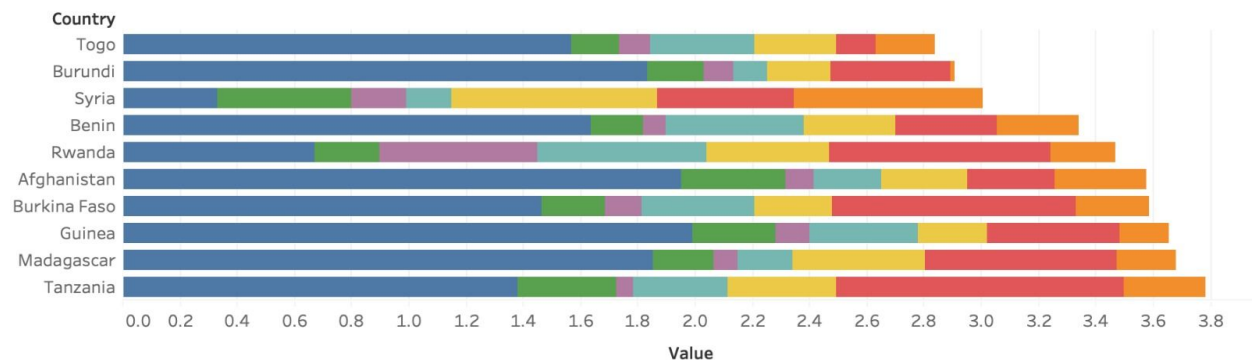
2017 Top 10

Dystopia Residual, Economy (GDP per Capita), Family, Health (Life Expectancy), Freedom, Generosity and Trust (Government Corruption) for each Country. Color shows details about Dystopia Residual, Economy (GDP per Capita), Family, Health (Life Expectancy), Freedom, Generosity and Trust (Government Corruption). The data is filtered on Year, which keeps 2017. The view is filtered on Country, which keeps 10 of 148 members.

Measure Names
- Economy (GDP per Capita)
- Family
- Health (Life Expectancy)
- Freedom
- Trust (Government Corruption)
- Generosity
- Dystopia Residual

2. Top 10 saddest countries
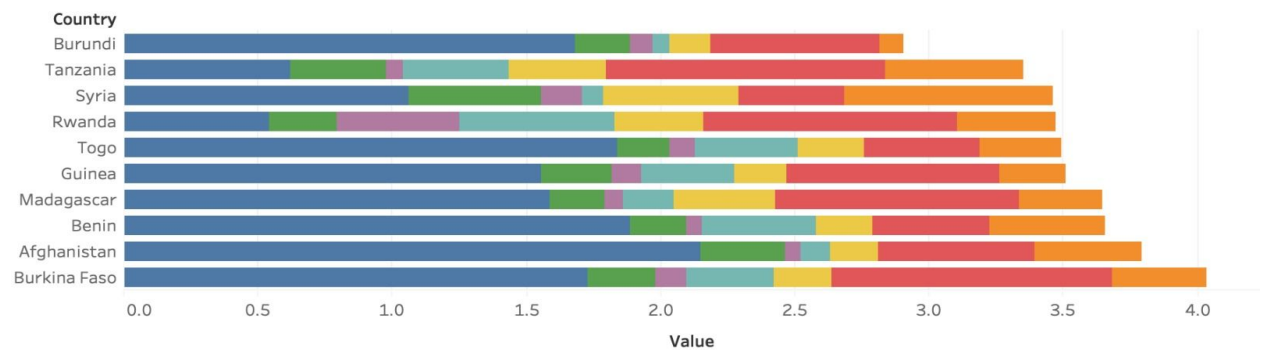
2015 Bottom 10

Economy (GDP per Capita), Family, Health (Life Expectancy), Freedom, Trust (Government Corruption), Generosity and Dystopia Residual for each Country. Color shows details about Economy (GDP per Capita), Family, Health (Life Expectancy), Freedom, Trust (Government Corruption), Generosity and Dystopia Residual. The data is filtered on Year, which keeps 2015. The view is filtered on Country, which keeps 10 of 148 members.
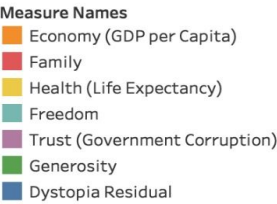
Measure Names
- Economy (GDP per Capita)
- Family
- Health (Life Expectancy)
- Freedom
- Trust (Government Corruption)
- Generosity
- Dystopia Residual
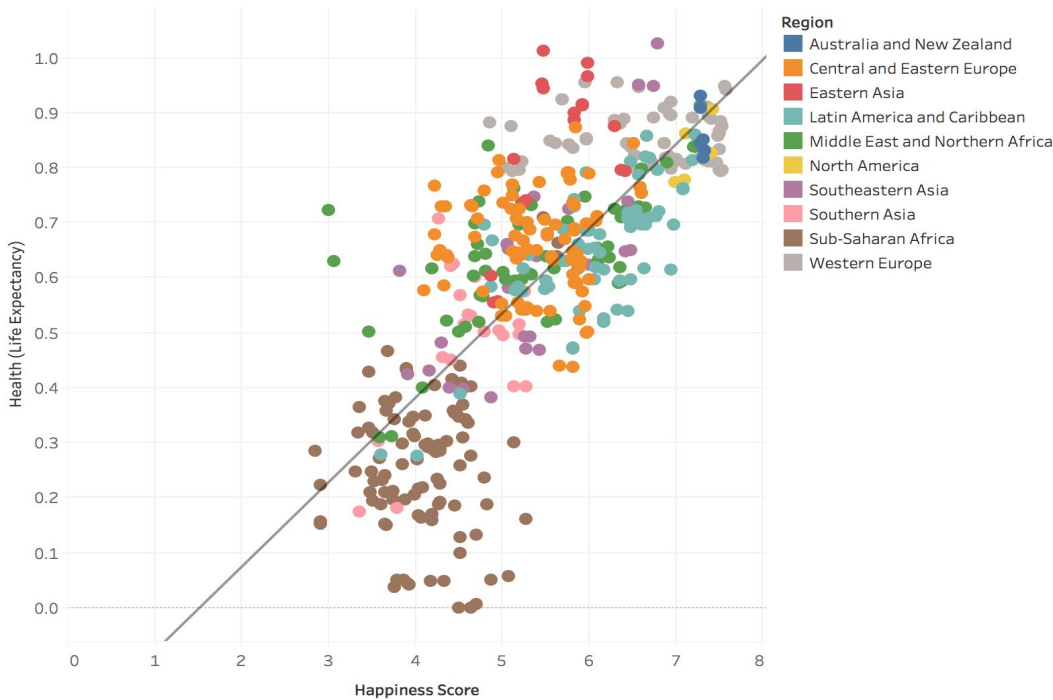
2017 Bottom 10

Country

Economy (GDP per Capita), Family, Health (Life Expectancy), Freedom, Trust (Government Corruption), Generosity and Dystopia Residual for each Country. Color shows details about Economy (GDP per Capita), Family, Health (Life Expectancy), Freedom, Trust (Government Corruption), Generosity and Dystopia Residual. The data is filtered on Year, which keeps 2017. The view is filtered on Country, which keeps 10 of 148 members.

Measure Names
- Economy (GDP per Capita)
- Family
- Health (Life Expectancy)
- Freedom
- Trust (Government Corruption)
- Generosity
- Dystopia Residual

2. How happiness score changes with respect to each of the following factors:
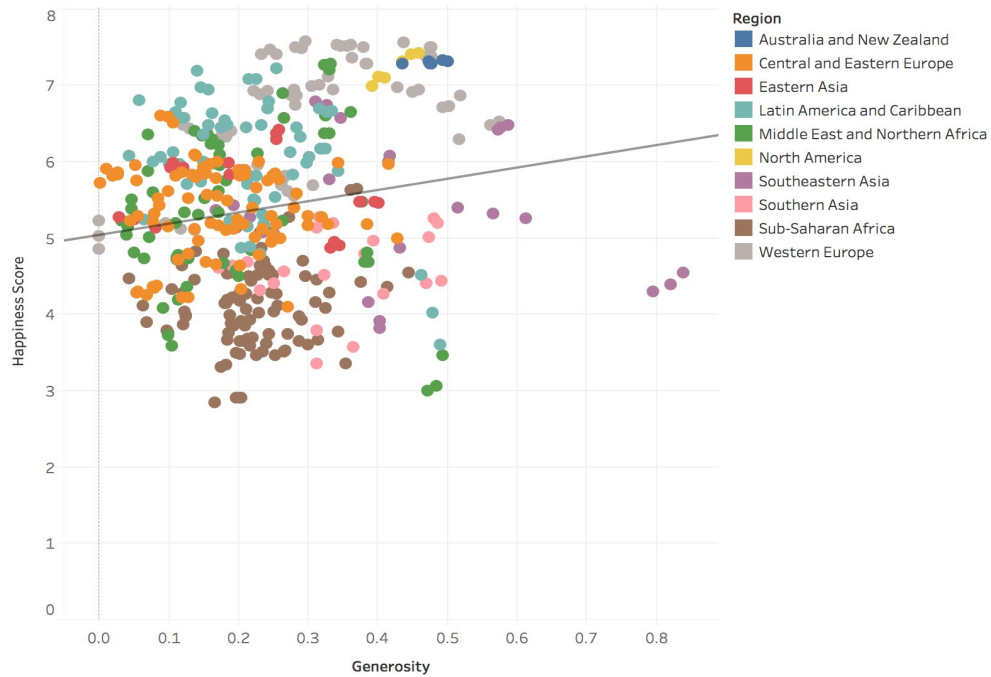
a. Health (Life expectancy)

Sheet 1

Happiness Score vs. Health (Life Expectancy). Color shows details about Region.
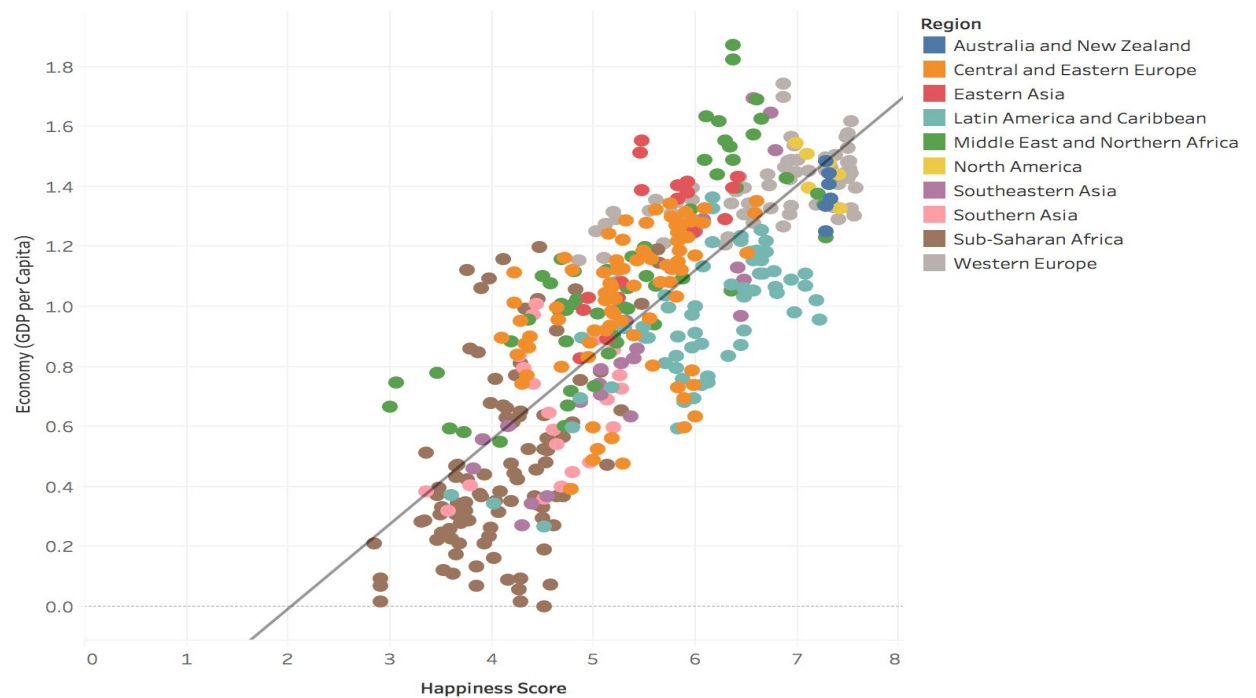
B. Generosity

Sheet 6

Generosity vs. Happiness Score. Color shows details about Region.
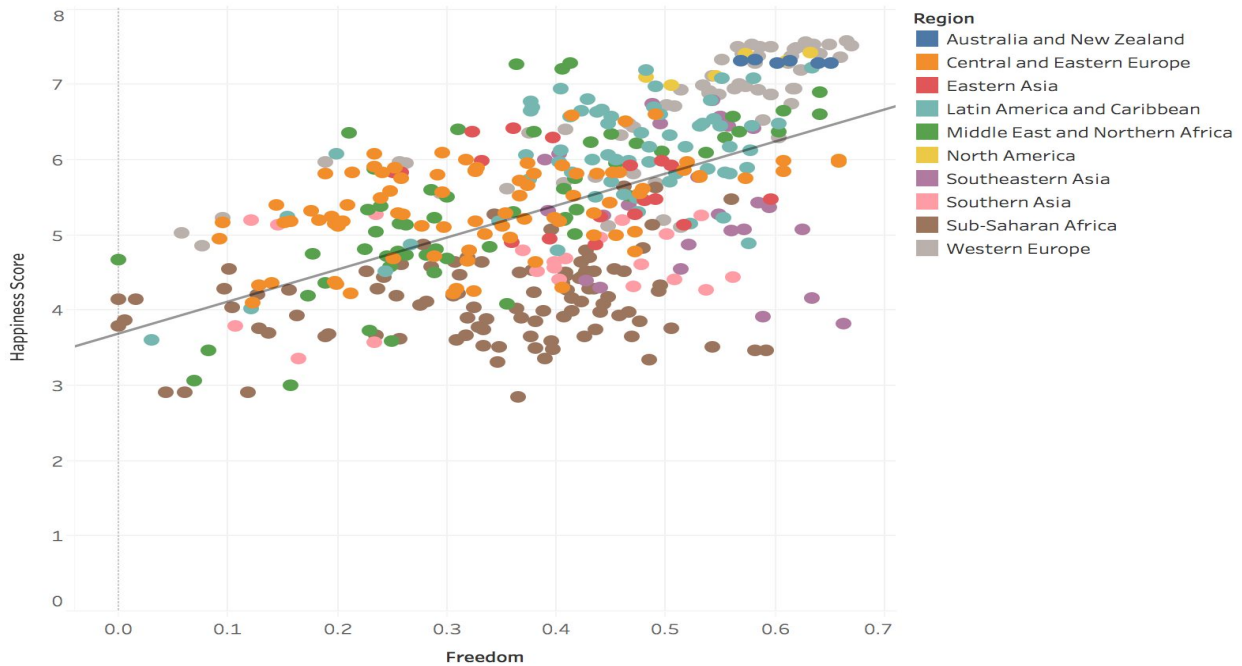
C. GDP (economy)

Sheet 2

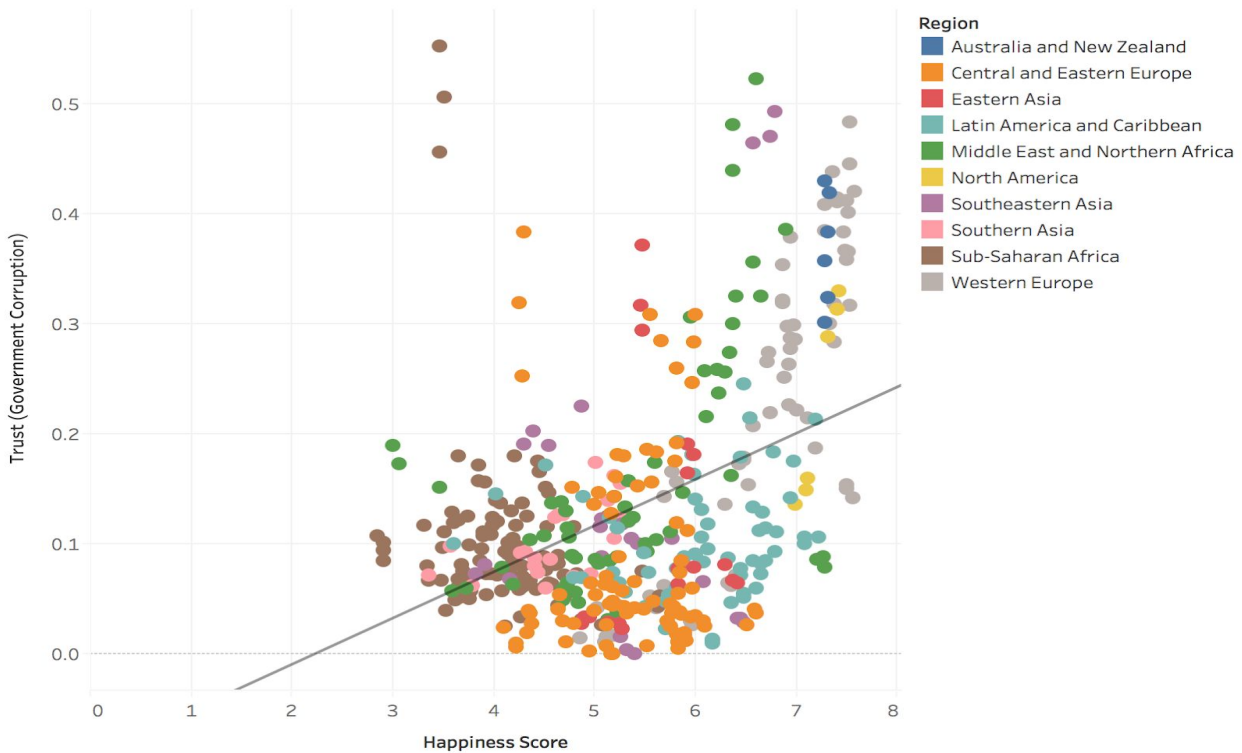Happiness Score vs. Economy (GDP per Capita). Color shows details about Region.

D. Freedom

Freedom vs. Happiness Score. Color shows details about Region.
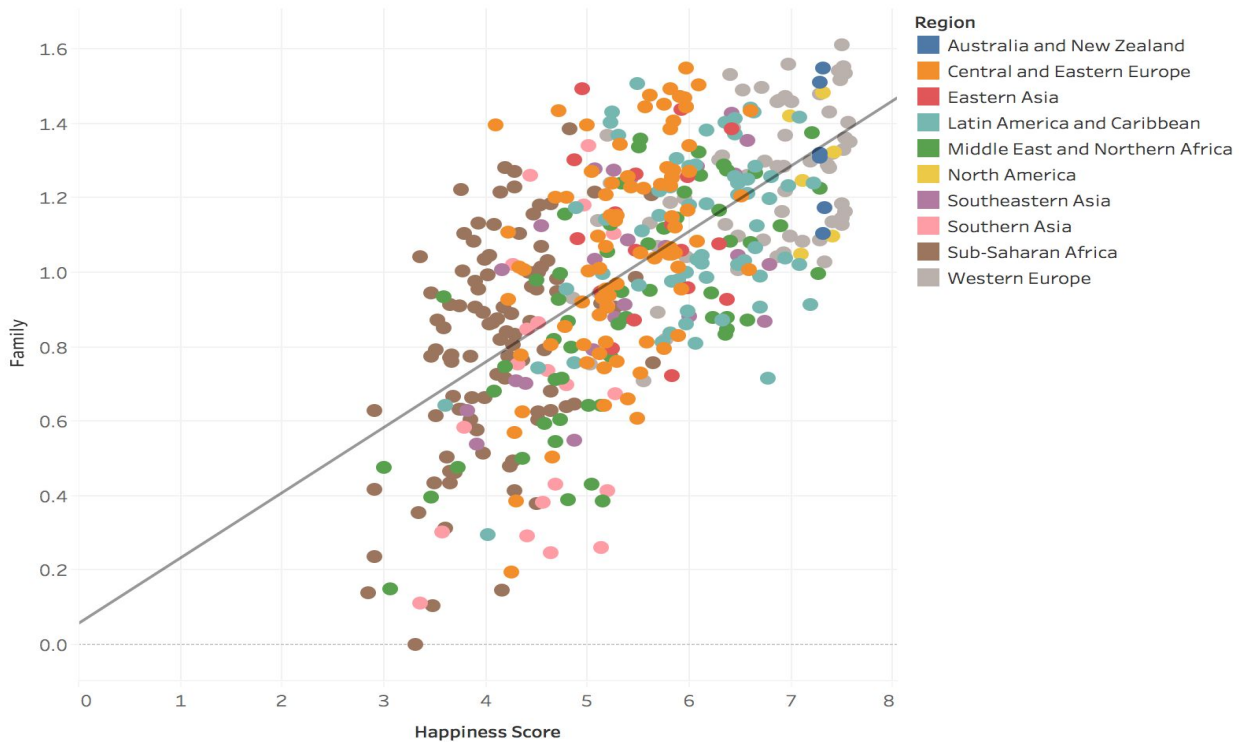
E. Trust (absence of corruption)

Happiness Score vs. Trust (Government Corruption). Color shows details about Region.
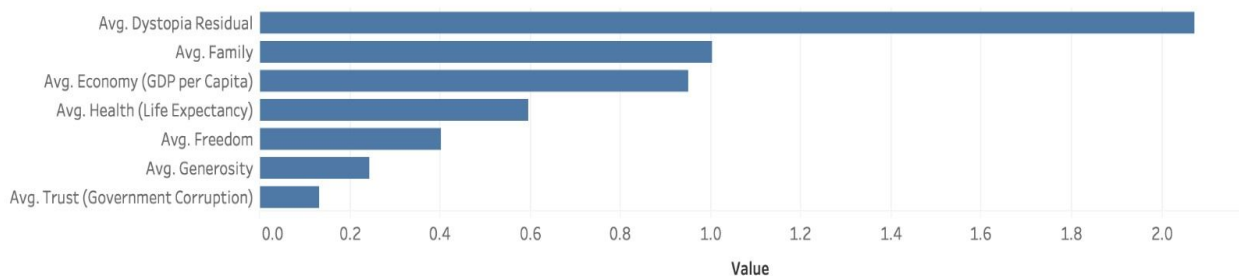
F. Social support (family)

Sheet 4

Happiness Score vs. Family. Color shows details about Region.

Contributions Average

Avg. Dystopia Residual, Avg. Family, Avg. Economy (GDP per Capita), Avg. Health (Life Expectancy), Avg. Freedom, Avg. Generosity and Avg. Trust (Government Corruption).

Observations:

The three major contributing factors to the happiness scores are Family(social support), GDP, and Life Expectancy. But high GDP does not always lead to high happiness score for example even though USA's GDP has been increasing, its happiness rank has been continuously declining. Burundi landed last in the ranking in 2017 with Tanzania joining the nation in the bottom five. These nations are defined by low income, poor access to decent health care facilities, violence, and political turmoil.
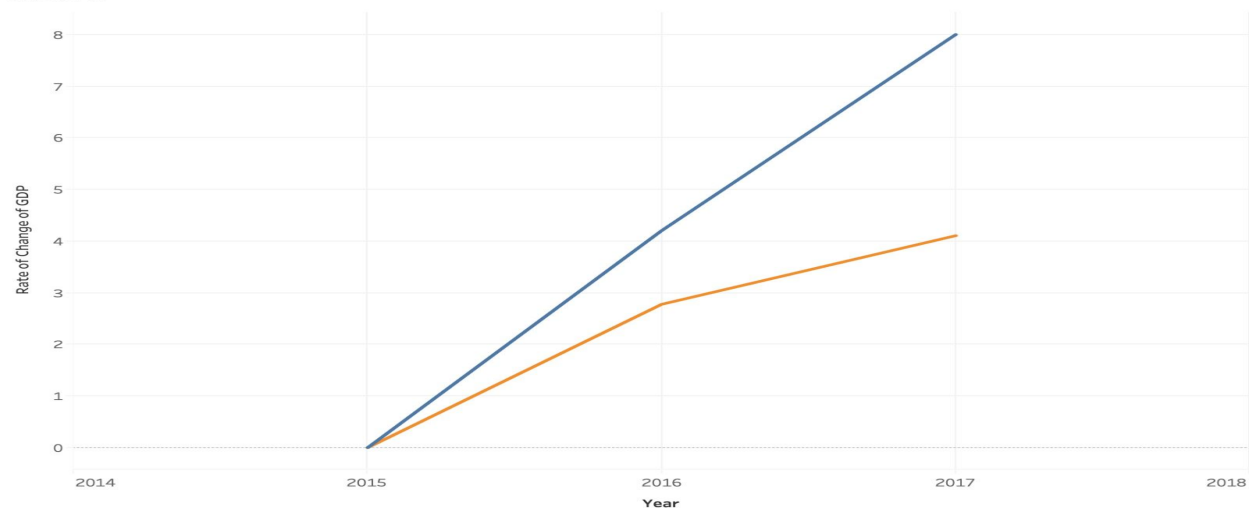
Storyboard:

Story: USA's declining happiness score - "a social not an economic crisis"

Background (Introduction to Happiness Scores): Happiness Index Score measures the sustainable well-being for a country. It is an indication which tells us how well a nation is doing at achieving long, happy, sustainable lives. It is important to measure the happiness index score because it is a better measure of a nation's progress than individual measures like GDP, Life Expectancy etc. Happiness Index Score is calculated taking factors like GDP per Capita, Family happiness, Life Expectancy, Freedom, Generosity, Trust etc. Taking these factors into consideration, we are analyzing how the happiness index score of USA increases or decreases due to the above factors.

Description: For the second consecutive year in 2018, the United States has taken a notch down in the World Happiness Report's annual ranking of more than 150 countries, published by the Sustainable Development Solutions Network, an initiative of the United Nations. It is a general belief that a country with a booming economy and high income should have a high happiness rank. But that's not the case with the USA. Over the last 3 years, we have seen a decline in its happiness rank irrespective of a continued increase in GDP.
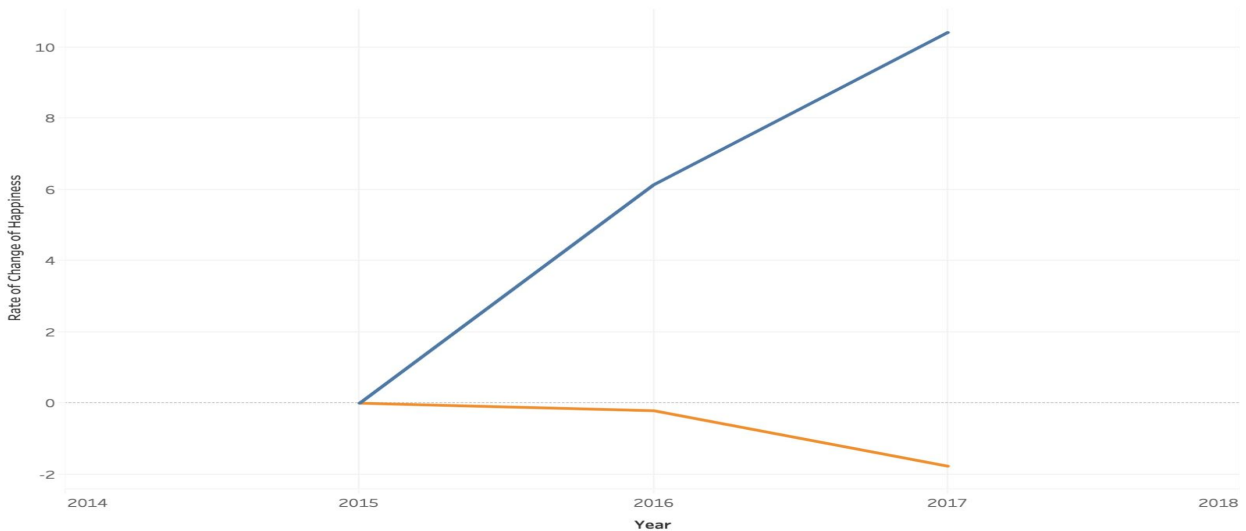

The trend of sum of Rate of Change of GDP for Year. Color shows details about Country.

Country
- Cameroon
- United States

Rate of Change of Happiness

Year

The trend of sum of Rate of Change of Happiness for Year. Color shows details about Country.

Country
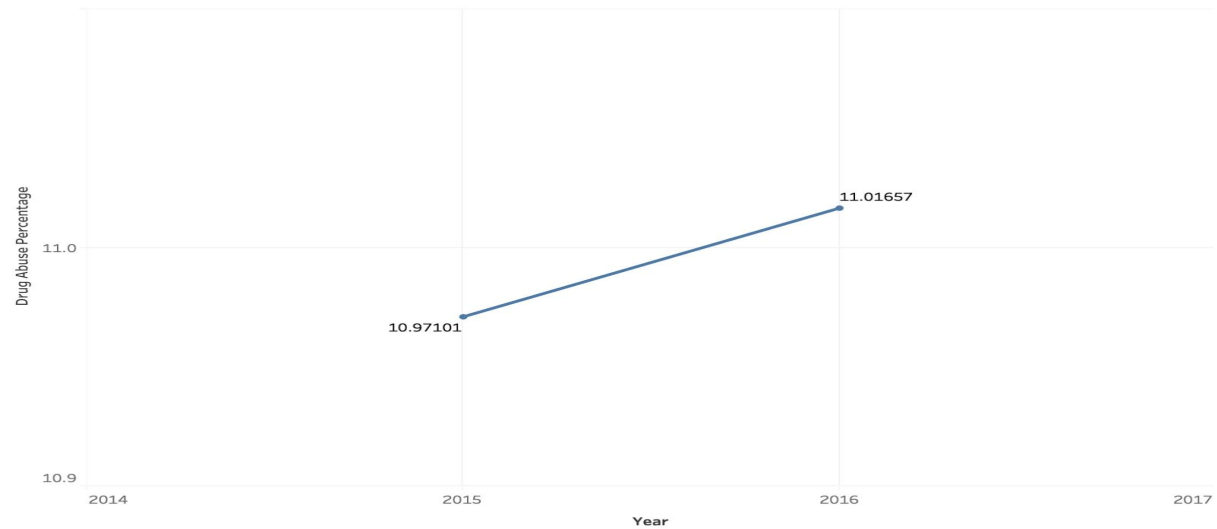■ Cameroon
■ United States

So what is it that caused this decline? We will try to delve into what other factors affect the happiness score and how.

1. **Increasing corruption and lobbying**: there has been an increase in perceptions of corruption in government and business entities.
2. **Weakened Social Support:** Social support networks in the U.S. have weakened over time. Positive and family relationships have degraded over time. To show the impact of weakened social support on happiness we can look at the Latin American countries. This region has lower confidence in institutions, vast income disparities. Also, some of the world's most violent cities fall into this region due to the global drug trade. But irrespective of all these factors, Latin America has a high happiness index. This reason is the abundance of family warmth and other supportive social relationships which frequently overshadow an emphasis on income.
3. **Substance Abuse:** America has seen a steady increase in opioids consumption and substance abuse leading to low life expectancy.
4. **Low generosity:** Happier countries tend to be more generous and think about extending advantages to future generations and other countries. We can see this by comparing the US with Norway. Norway was a leader in 2017 happiness ranking. Norway has been continuously working towards conserving its oil resources, unlike the USA.

We will try to observe these factors via graphs depicting the trend in the happiness score and each of these factors. Some sample visualizations are as below.

1. Drug Abuse in the United States from 2015-2016

Sheet 1

11.01657

10.97101

Drug Abuse Percentage

11.0

10.9

2014   2015   2016   2017
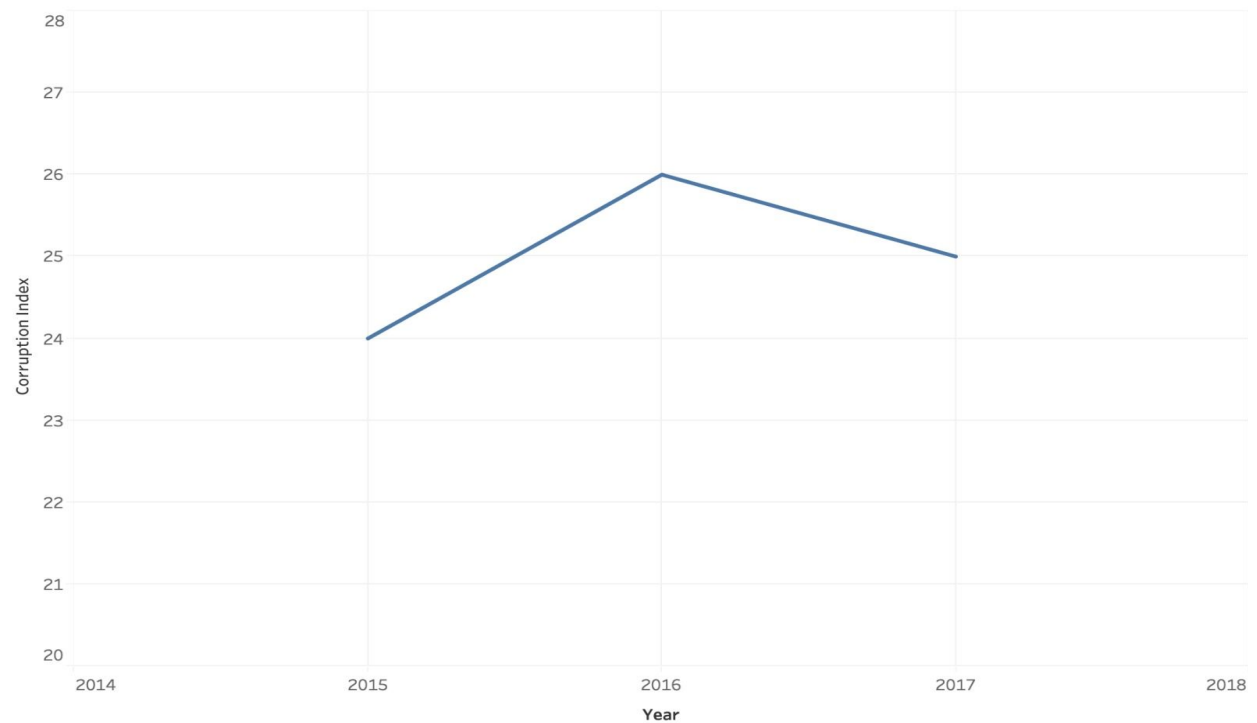
Year

The trend of sum of Total for Year. Color shows details about Country.

Country
■ United States

2. Corruption Index of the USA from 2015-2017

Sheet 1

Corruption Index

28
27
26
25
24
23
22
21
20

2014   2015   2016   2017   2018

Year

The trend of sum of Corruption Index for Year. Color shows details about Country.

Country
■ United States

Conclusion:

While one might think the GDP is a very good indicator for the happiness of a country, this is simply not true. There are other factors that outweigh GDP as contributing factors. Factors like family, close relationships, trust are more indicative of a country's happiness, as is evident from countries in Latin America. We can find these factors and to increase the happiness in the USA, policies should be made that target on social welfare rather than simply focusing on economic growth for a happier future.

Changelog

We started the project with the objective of finding the most important features for happiness, and have now concentrated our focus on what makes the United States happy. We have selected the United States for the story because of its interesting feature for happiness decline. We have not digressed from the original story topic but only made our problem statement specific.

List of items already implemented:
1. Graphs of Top 10 saddest countries in 2015,2016 and 2017
2. Graphs of Top 10 happiest countries in 2015,2016 and 2017
3. A page with the project description and an interactive UI to switch between top 10 happiest and saddest countries in 2017

List of items yet to be implemented:
1. Line charts to show the comparison of the following factors with Happiness Index for the USA from 2015-2017
   a. GDP
   b. Drug Abuse
   c. Corruption
   d. Generosity
   e. **Family support**

*We are also looking for alternative graphs to use in place of line charts as suggested in the first milestone review. Also, we will try to make the system more interactive.

Demo Link: https://nyu-vis-fall2018.github.io/Word-Happiness-Analysis/

Github link: https://github.com/NYU-VIS-FALL2018/storytelling-group-11

Changelog:
We could not find any dataset to show the Family Support data, we used another factor - "Income inequality" and analyzed the effect on the happiness score.

Feedback Received:
During the feedback session, we were asked to change the colors of the graphs, so we used more appropriate colors in our bar charts. We also discussed if we can use any other graphs to show the trends, but later we all agreed on using line charts only