World Happiness Trends

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World Happiness

Outline

INTRODUCTION

Have you ever thought about world happiness trends?

We had no knowledge on the matter until discovering the data available in Kaggle.com. We were interested and determined to analyze World Happiness data available to discover the key factors that inspire happiness around the world.

QUESTIONS

1. What are the top 20 happiest countries in the world?
2. What key factors inspire happiness in each region of the world?
3. How does the happiness score differ per region?
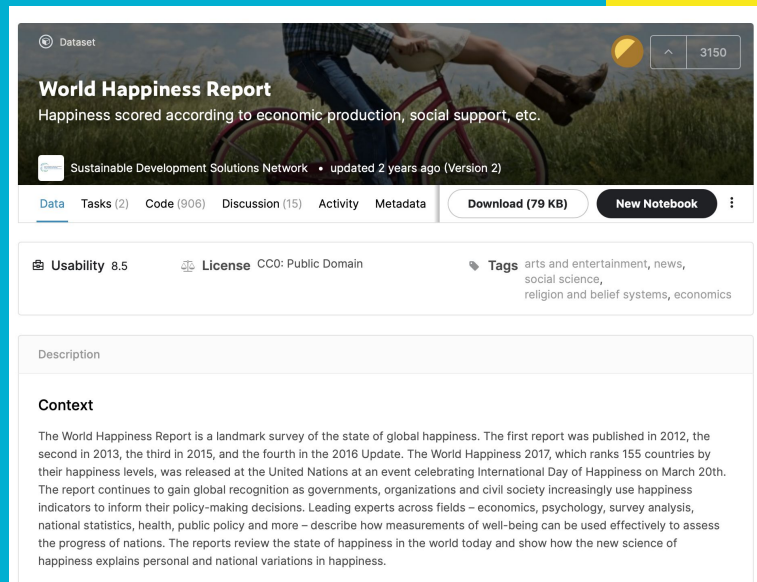4. How have happiness factors changed over the years from 2015 through 2019?

PRE-ANALYSIS HYPOTHESIS

- In today's rapidly changing world, we would think that money might easily be one of the main reasons that contribute to people's happiness, we'll proceed with an analysis on the data to find out.

- Developed countries are happier.

DATA COLLECTION

Kaggle Dataset(s):
World Happiness Report

https://www.kaggle.com/unsdsn/world-happiness?select=2015.csv

DATA COLLECTION

- From the Gallup Global Research
- Groundbreaking benchmark from the United Nation's Sustainable Development Solutions Network
- Years 2015 - 2019
- Measures happiness score per country and region
- Happiness score estimates the extent to which each of six factors -- economy (GDP per capita, family (support), health (life expectancy), freedom, trust (government corruption), and generosity -- contribute to making life evaluations higher in each country
- Over 150 Countries and 10 regions combined

DATA EXPLORATION & CLEANING

- Step 1: Read in the CSV data for each year
- Step 2: Add a column denoting the year the data relates to
- Step 3: If needed, rename columns for the sake of consistency across years in the data
- Step 4: Drop all non-predictive variables that shouldn't be included in the analysis
- Step 5: Rearrange the data fields to be consistent year over year
- Step 6: Group each year's clean data set into a list, combined the data into a multi year data set, and create new variables
- Step 7: Export the data for the top 20 countries and for all countries

DATA EXPLORATION & CLEANING
(Continued)

```python
## 2018 Data Cleaning
# Import 2018 World Happiness Data
data_2018 = pd.read_csv('./Resources/2018_data.csv')

# Add column indicating the year
data_2018['Year'] = '2018'

# Rename data fields to match prior years
data_2018_rename = data_2018.rename(columns={'Overall rank': 'Happiness Rank',
                                               'Country or region': 'Country',
                                               'Score': 'Happiness Score',
                                               'GDP per capita': 'Economy (GDP per Capita)',
                                               'Social support': 'Family',
                                               'Healthy life expectancy': 'Health (Life Expectancy)',
                                               'Freedom to make life choices': 'Freedom',
                                               'Perceptions of corruption': 'Trust (Government Corruption)'})

# Rearrange the data fields
column_order = ['Year','Country','Happiness Rank','Happiness Score','Economy (GDP per Capita)','Family',
                'Health (Life Expectancy)','Freedom','Trust (Government Corruption)','Generosity','Dystopia Residual']
data_2018_clean = data_2018_rename.reindex(columns = column_order)

data_2018_clean
```

DATA EXPLORATION & CLEANING (Continued)

```python
# Aggregate cleaned data sets from each year into one file
data_list = [data_2015_clean, data_2016_clean, data_2017_clean, data_2018_clean, data_2019_clean]
multi_year_data = pd.concat(data_list)
multi_year_data
```

```python
# Group the data sets by country
total_country_rank = multi_year_data.groupby('Country')['Happiness Rank'].sum()

# Calculate the average happiness rank for each country over the 5 year period
avg_country_rank = total_country_rank/5
data_rank = pd.merge(left=multi_year_data, right=avg_country_rank, on='Country')
data_rank
```

```python
# Export data for all years
data_rank_all.to_csv('Resources/clean_data/data_country_all.csv', index=False)
```

```python
# Sort the data set and drop values below top 20
data_rank_all_sort = data_rank_all.sort_values('Avg Happiness Rank')
data_rank_top = data_rank_all_sort.drop(range(100,len(data_rank_all_sort)))
data_rank_top
```
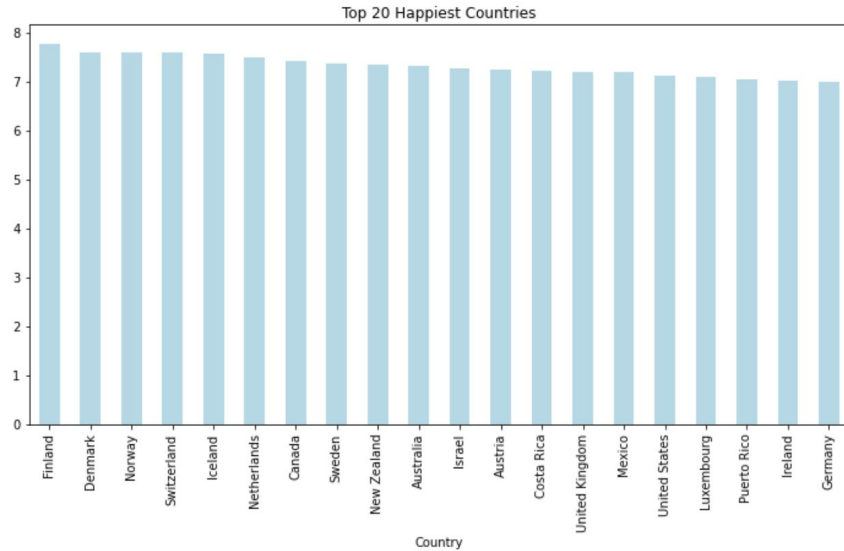
ANALYSIS PROCESS

Values Explained

- **Happiness Rank: rank of any country in a particular year**
- **Happiness Score: sum of all numerical columns in the datasets**
- **Each factor describes the extent to which it contributed in evaluating the happiness in each country/region:**
  - **Economy (GDP per Capita)** – "Gross domestic product (GDP) is among the most frequent indicators used to **monitor the health of a country's economy**. The calculation of a nation's GDP takes into account several distinct variables relating to this nation's market, including its investment and consumption."
  - **Family (Social Support)** –"If you were in trouble, do you have relatives or friends you can count on to help you whenever you need them, or not? "
  - **Health (Life Expectancy)** –"The time series of healthy life expectancy at birth are constructed based on data from the World Health Organization (WHO) Global Health Observatory data repository."
  - **Freedom** – Freedom to make life choices: "Are you satisfied or dissatisfied with your freedom to choose what you do with your life?"
  - **Trust (Government Corruption)** – "Is corruption widespread throughout the government or not? " & "Is corruption widespread within businesses or not?"
  - **Generosity** – "Have you donated money to a charity in the past month?"
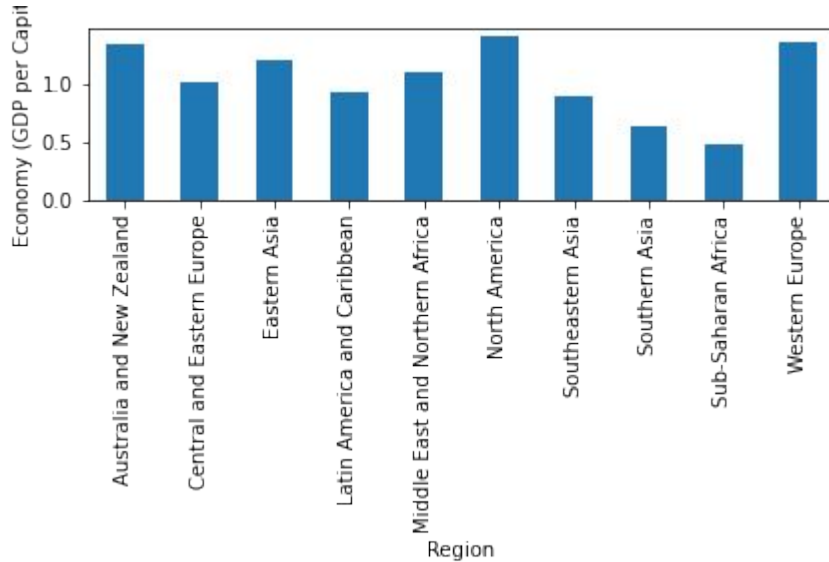   Resource: Social Environments for World Happiness | The World Happiness Report

ANALYSIS PROCESS

Top 20 Happiest Countries

Top 20 Happiest Countries:

From the bar chart, we can see the top 20 Happiest countries in the world. Our chart shows the average happiness rating in 5 years.
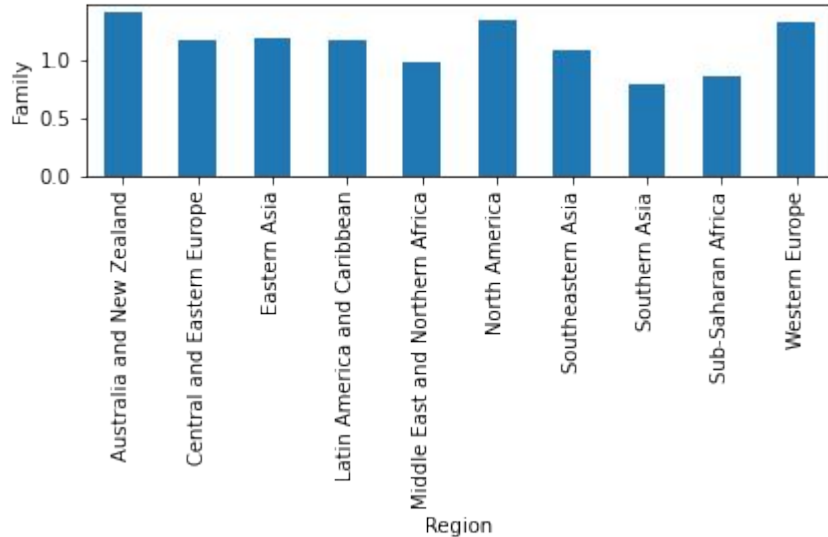
ANALYSIS PROCESS

1. Economy Factor V.S. Region:

From the bar chart, we can see that between 2015 ~ 2019, North America has the highest GDP per capita, followed by Western Europe, and Australia & New Zealand. The lowest score is Sub-Saharan Africa.
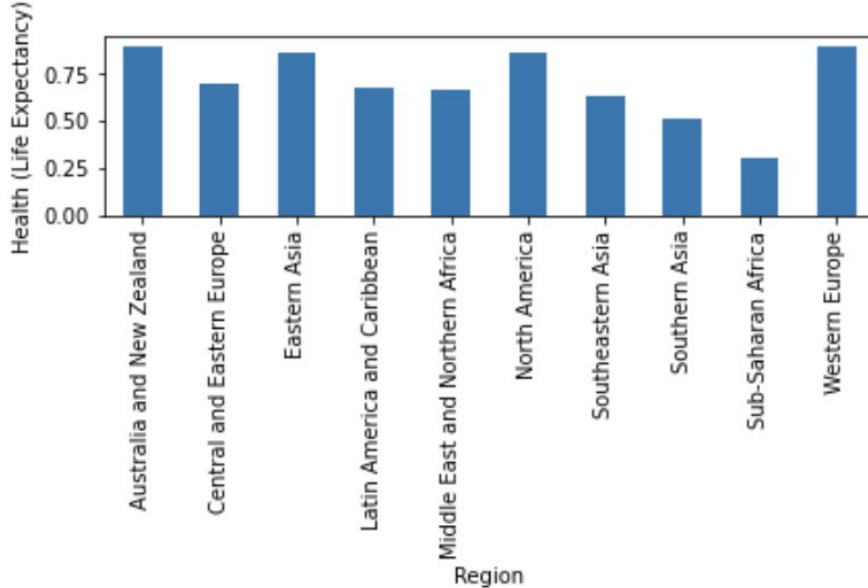
ANALYSIS PROCESS

2. Family Factor V.S. Region:

From the bar chart, we can see that Australia & New Zealand, North America and Western Europe are the regions that have the highest scores related to family factors. The lowest score is Southern Asia.
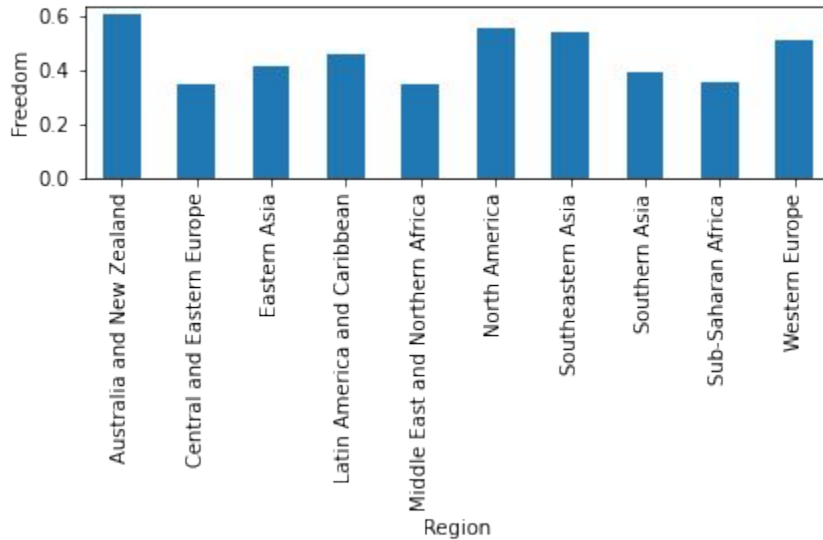
ANALYSIS PROCESS

3. Health (Life Expectancy) by Regions:

The chart shows the relationship between Health and happiness by continents. Australia and New Zealand have the highest rating. Western Europe is second and Eastern Asia come third.
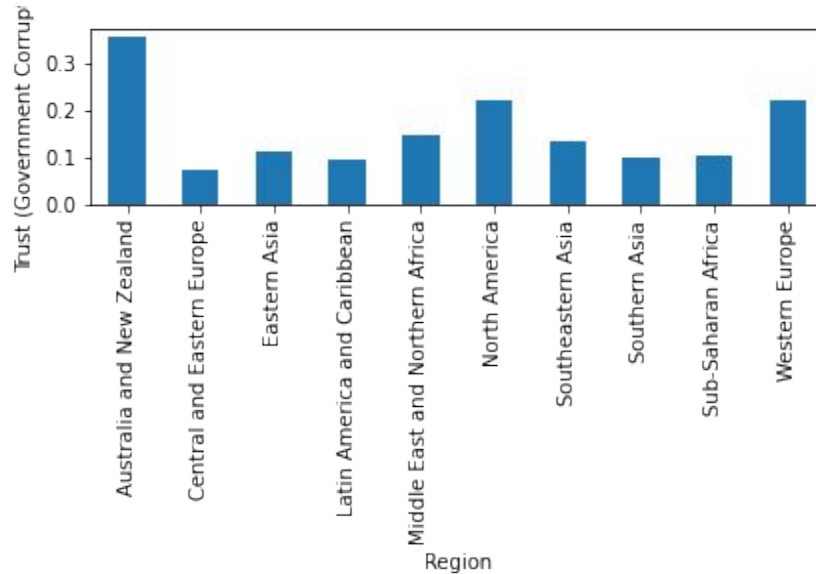
ANALYSIS PROCESS

4. Freedom Factor V.S. Region:

From the bar chart, we can see that Australia & New Zealand has the highest score in Freedom, followed by North America and Southeastern Asia.
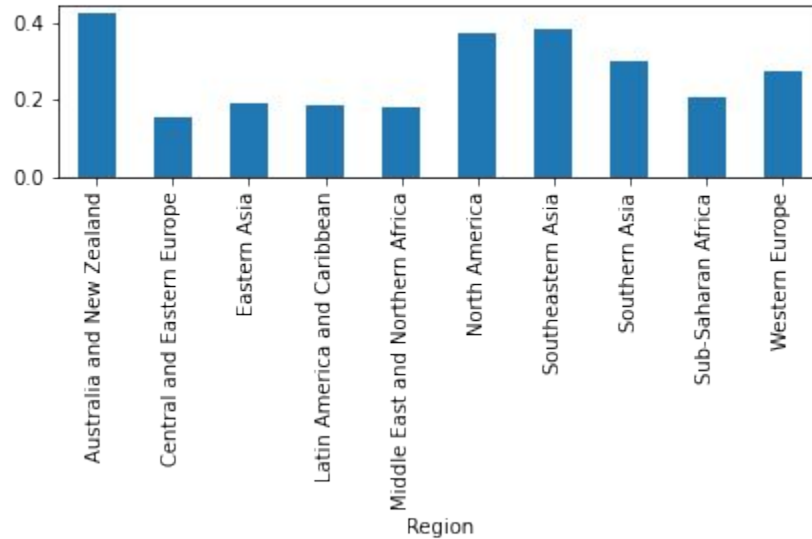The lowest in score is Middle East and Northern Africa.

ANALYSIS PROCESS

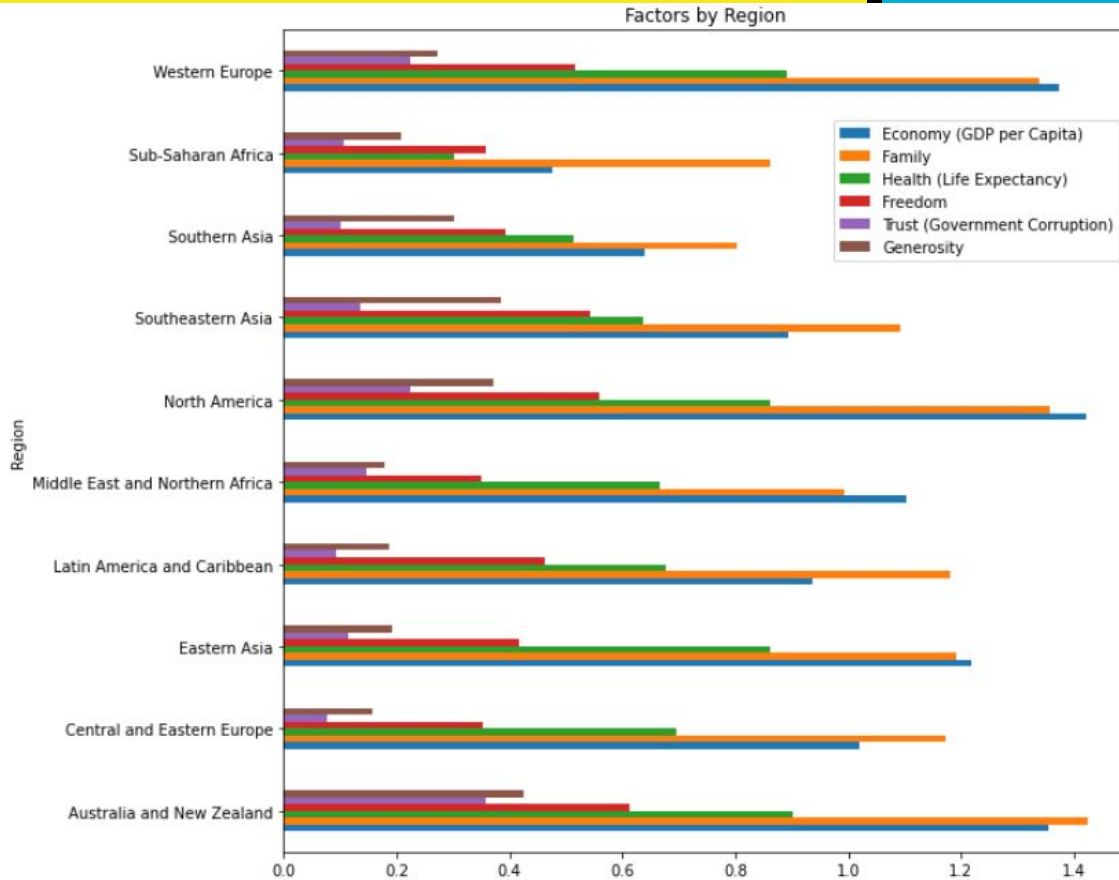
5. Trust(Government Corruption) by Regions:

The chart shows the relationship between trust and happiness by continents. Australia and New Zealand have the highest rating. The top 20 happiest countries all have relatively high rating of government trust.

ANALYSIS PROCESS

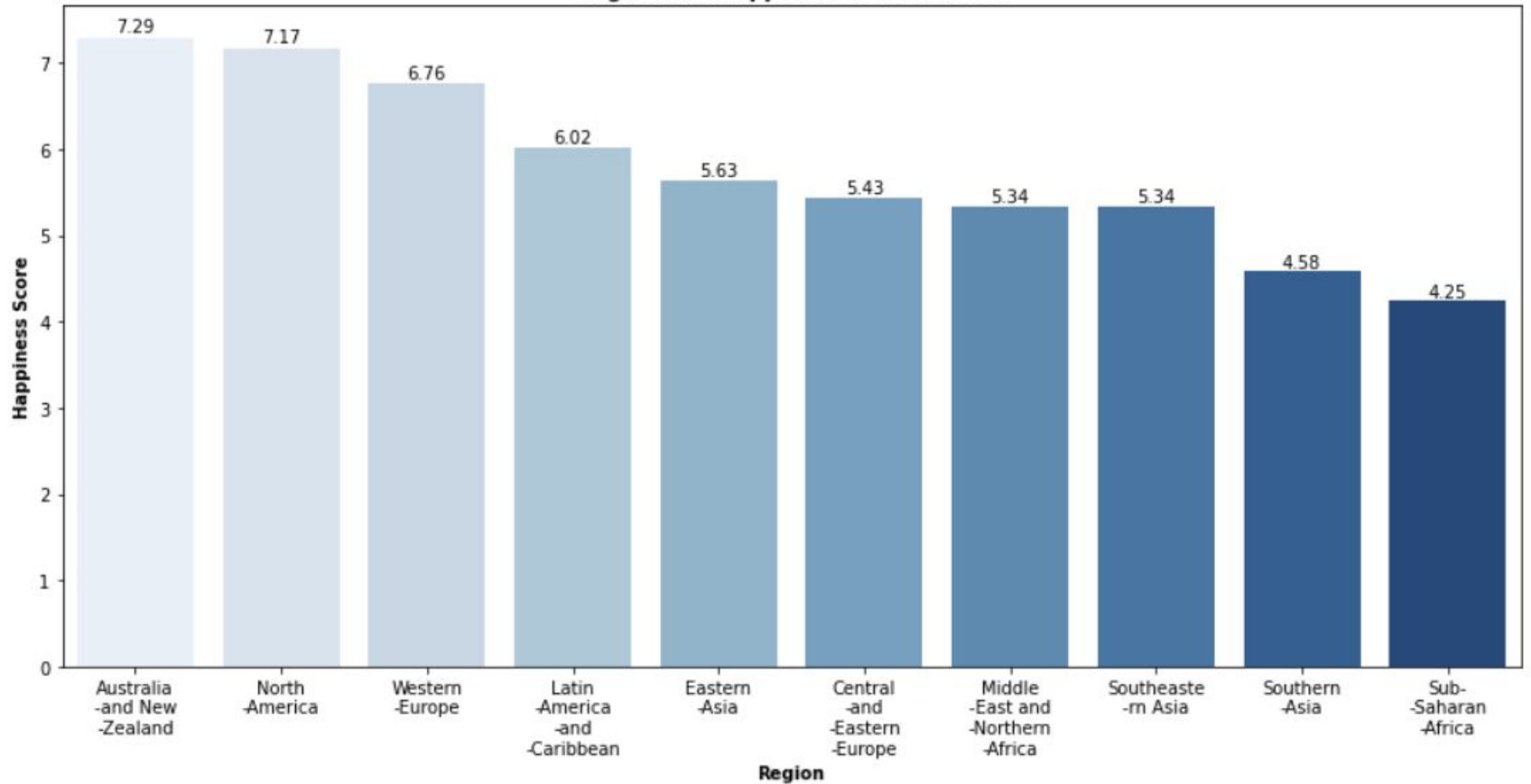
6. Generosity Factor V.S. Region:

From the bar chart, we can see that Australia and New Zealand has the highest score in Generosity, followed by Southeastern Asia, and North America. The lowest score is Central and Eastern Europe.

Factors by Region

Factors by Region:

According to the analysis and the chart, we can see that the GDP per Capita plays a biggest factors for most regions and the next is family. The least factor is Generosity and Trust.
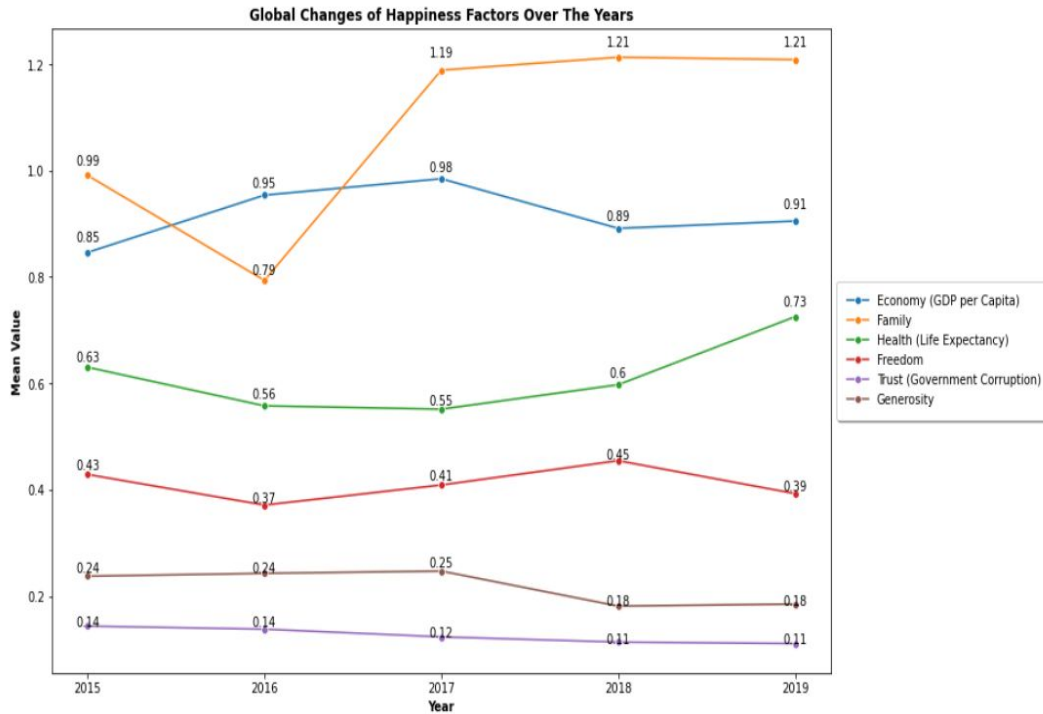
Region and Happiness Score (Mean)

ANALYSIS PROCESS

How does the happiness score differ per region?

- By looking at the chart above, we determined the average happiness score per region from 2015 through 2019, the Australia and New Zealand region is the happiest with a mean score of 7.29, and North America comes second with a mean score of 7.17. The following regions came in order of highest to lowest: Western Europe (6.76), Latin America and Caribbean (6.02), Eastern Asia (5.63), Central and Eastern Europe (5.43), Middle East and North Africa (5.34), Southeastern Asia (5.34), Southern Asia (4.58), and Sub-Saharan Africa (4.25).
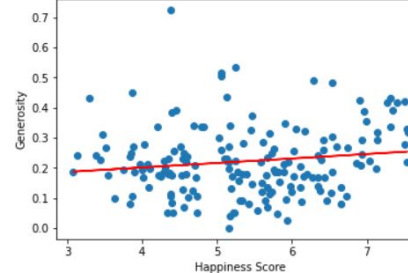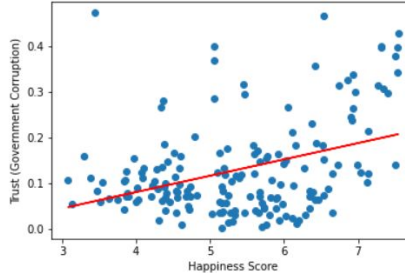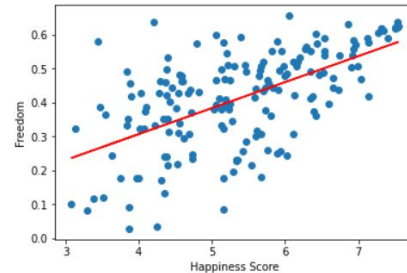
ANALYSIS PROCESS

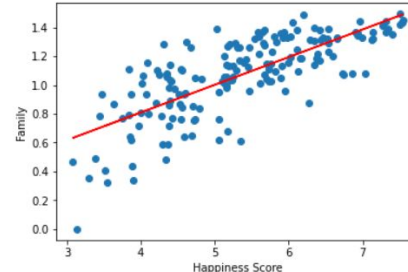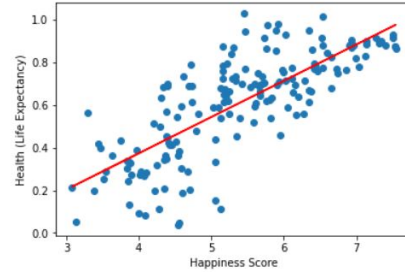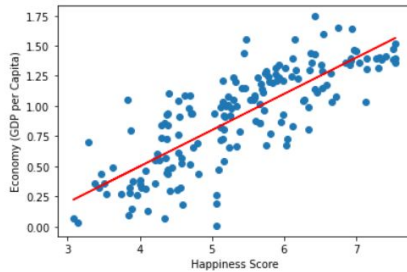Global Changes of Happiness Factors Over The Years

7. Global Changes of happiness factors over the years:

The chart shows how happiness factors were changing over the course of five years.
The impact of the factors do not change much over time. Except we can see that Family/Social Support increased its impact on the overall global happiness since 2016, surpassing GDP per Capita.

CONCLUSIONS/IMPLICATIONS

Scatter Plot Comparisons for Each Factor:
From the scatter plots below, we can see that most factors have positive correlation to the overall Happiness Score.
Among all the factors, from the plots we can see that GDP has the highest correlation with Happiness Score, followed by Health (Life Expectancy), then Family (Social Support).
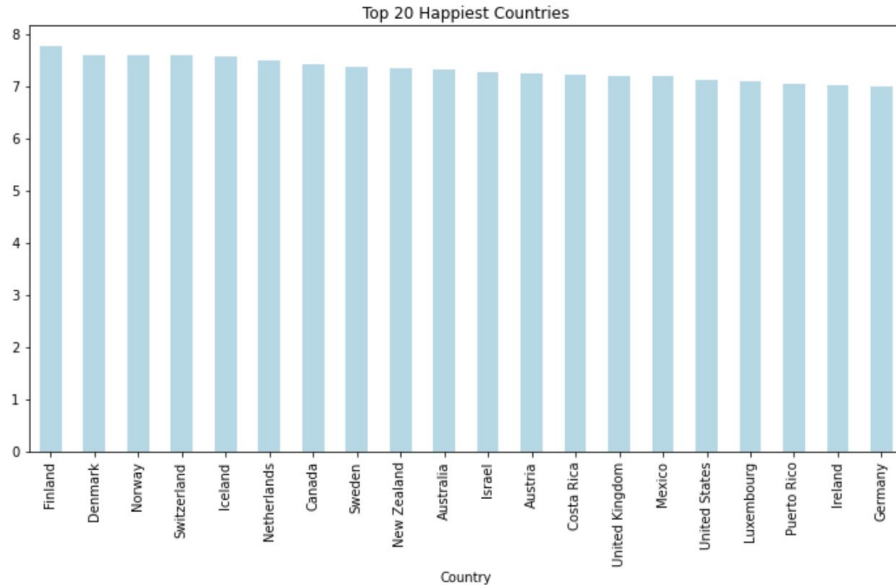

R value rank:
1. **GDP per capita =** 0.645
2. **Health (Life Expectancy)** = 0.596
3. **Family** = 0.571
4. **Freedom** = 0.347
5. **Trust (Government Corruption)** = 0.142
6. **Generosity** = 0.020

CONCLUSIONS/IMPLICATIONS

Based on the scatter plots and our findings, we can see that GDP has the highest correlation with the Happiness Score, and is one of the main reasons for people's happiness, but Health (Life Expectancy) and Family (Social Support) are almost as important factors as the GDP. So, we can say that money is important, but we also have to feel supported by family and society around, as well as remain healthy, in order to sustain the maximum degree of happiness.
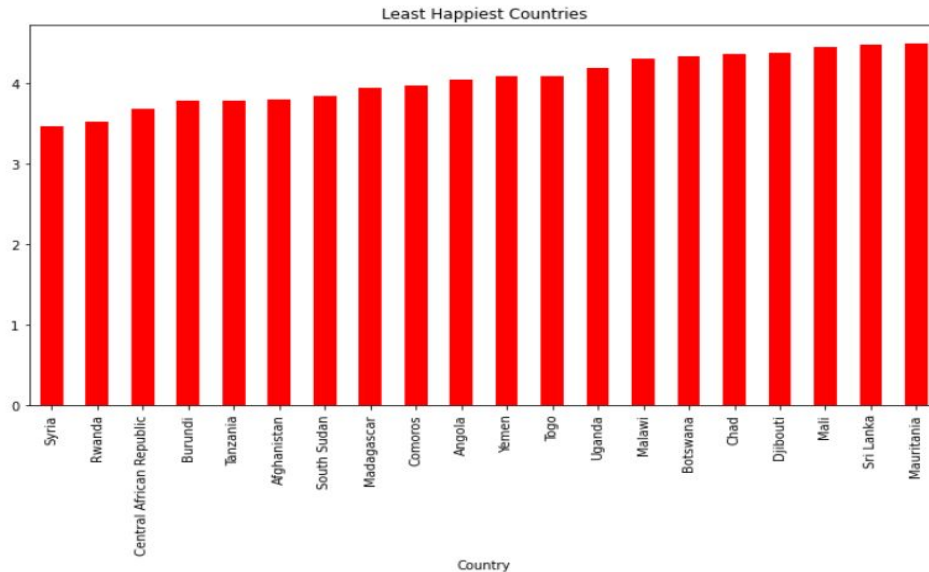
CONCLUSIONS/IMPLICATIONS

Developed countries are happier.

Top 20 Happiest Countries

Based on our analysis, developed countries project higher happiness scores than underdeveloped countries according to the top 20 countries, ranging above the 7.0 Happiness Score from years 2015 through 2019.

CONCLUSIONS/IMPLICATIONS

Developing countries are not as happy.

Least Happiest Countries

Based on our analysis, developing countries project lower happiness scores than developed countries according to the bottom 20 countries, ranging below the 5.0 Happiness Score from years 2015 through 2019.

Q&A

THANK YOU