Happiness Levels by Countries

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Our Motivation

Mental health is an important part of overall health and well-being. Health care professionals are interested in factors that influence and affect mental health from a psychological and physical perspective.

We were interested in levels of perceived happiness in different countries and how that could affect healthy life expectancy.

Research Questions:

- Where are the happiest and least happiest countries in the world?

- Is there a correlation between high life expectancy and higher levels of happiness and what variables (social support, perception gov't corruption) strongly contribute to that?

- From 2019 to 2022 do levels of happiness increase coming out of the pandemic in 2020?

World Happiness Report Data

- World Happiness Report is a publication that started ten years ago and ranks levels of happiness by country every year. The report takes into consideration six factors that contributes to a countries' happiness score including variables that would help to differentiate happiness by country.

- The data set used to analyze happiness by country was a csv that had scores of happiness from years 2005 - 2022

- For the purposes of this project we only looked at years 2019 - 2022

- Different variables that were measured by country were: life ladder (happiness score; higher the better), GDP per capita, social support, healthy life expectancy, freedom to make life choices, generosity, and perceptions of corruption.

- For the purposes on our analysis we focused on the correlation between Life ladder scores and life expectancy and what variables may affect this the most such as perceptions of corruption in governments and social support.

The 5 Happiest Countries in the World
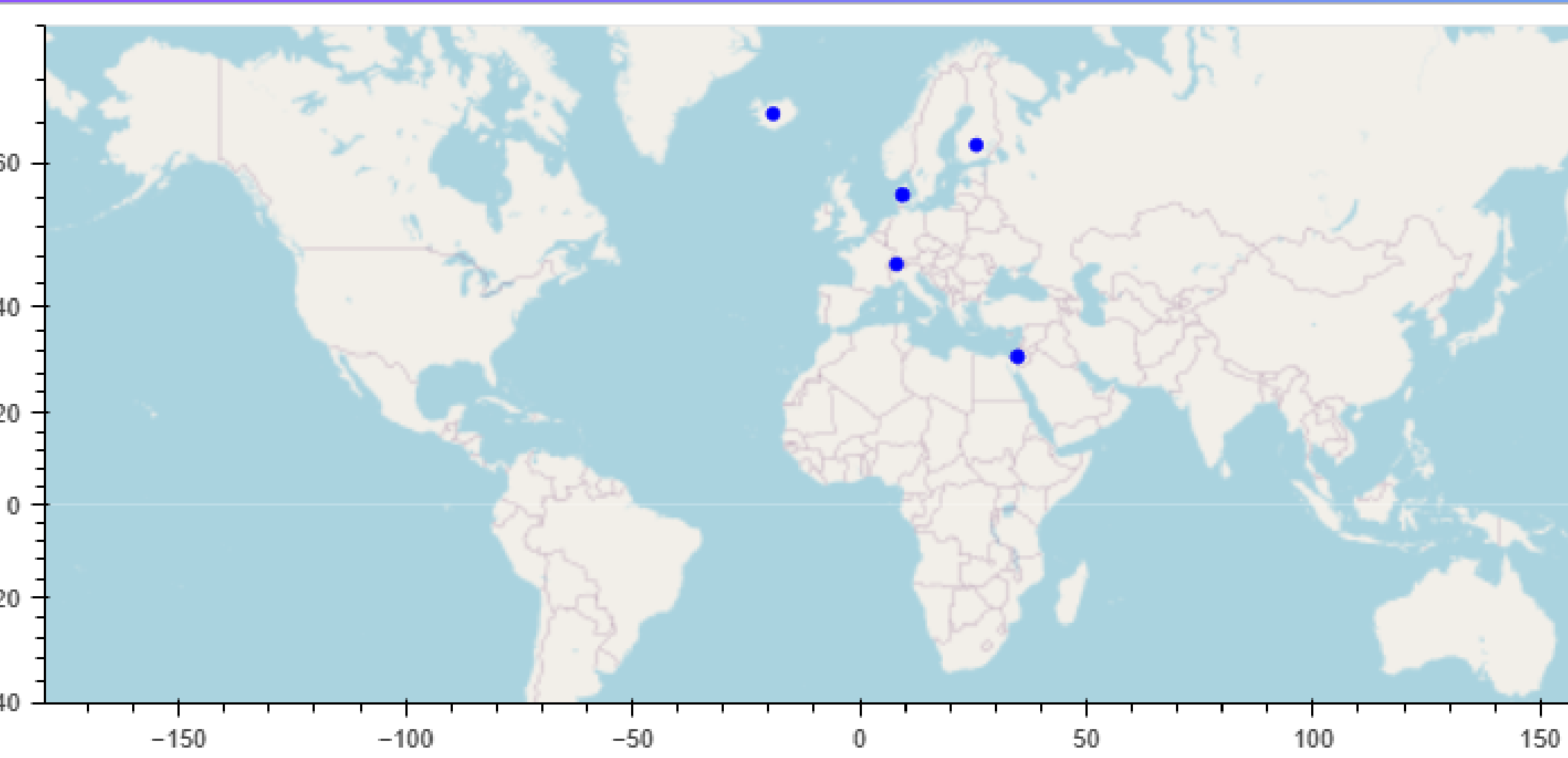
The top 5 happiest countries in the world are:
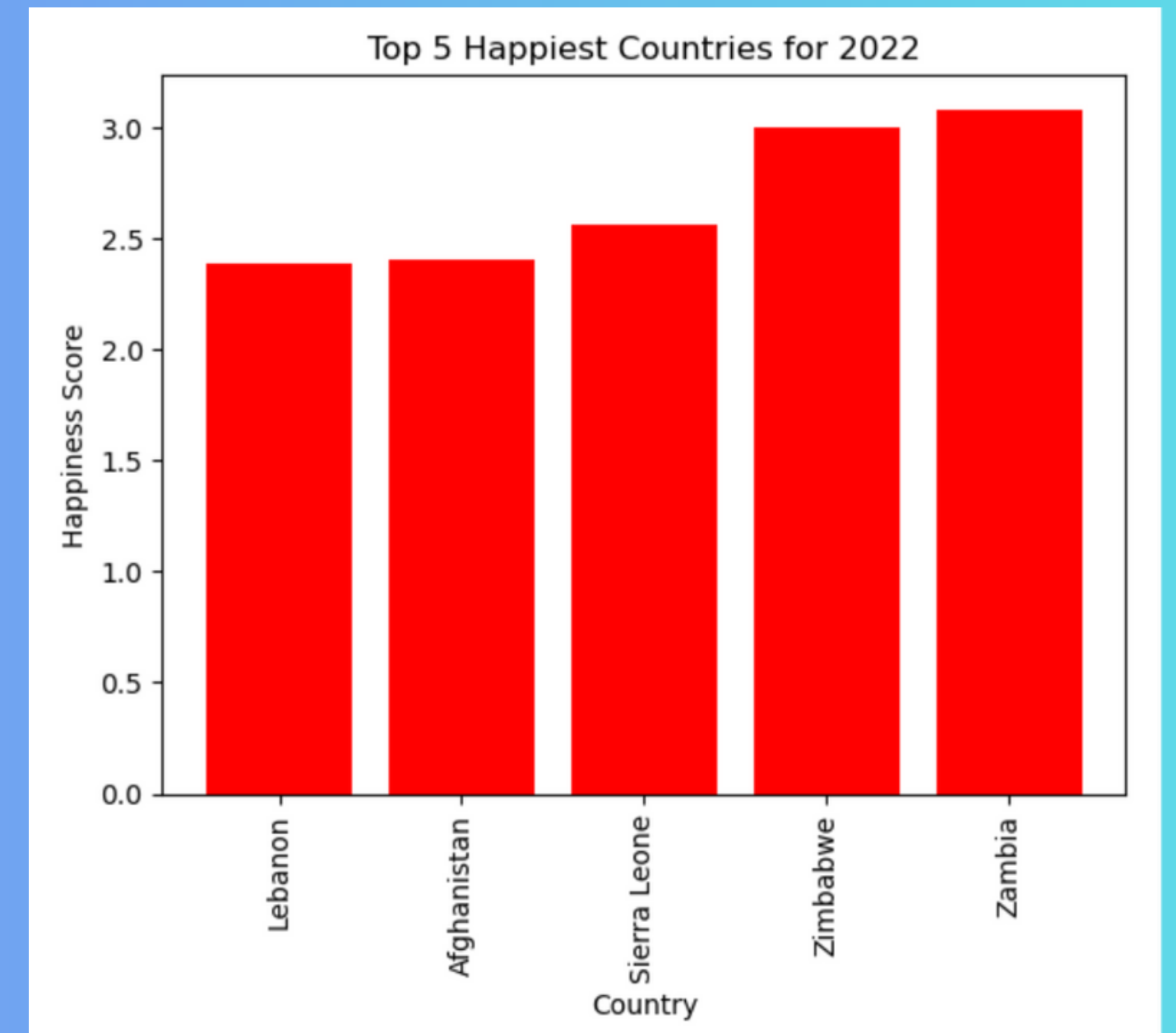**Overall top 5 life ladder scores:**
- **Finland: 7.798**
- **Denmark: 7.696**
- **Switzerland: 7.694**
- **Israel: 7.620**
- **Iceland: 7.575**
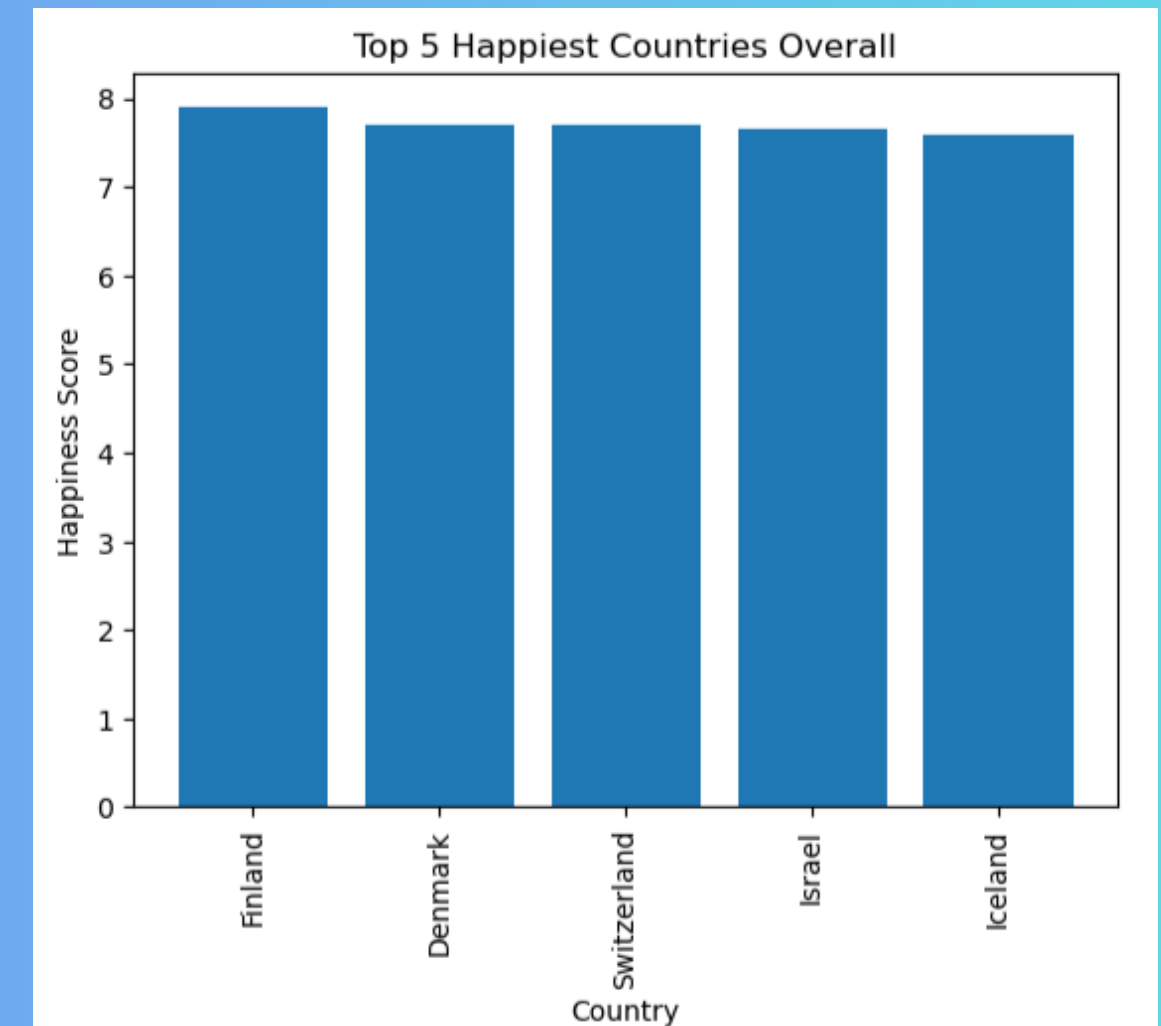
The 5 Least Happiest Countries in the World

The 5 least happiest countries in the world are:
Overall lowest 5 life ladder scores:
- Lebanon: 2.3883
- Afghanistan: 2.4055
- Sierra Leone: 2.5600
- Zimbabwe: 3.003
- Zambia: 3.0820



Top 5 Happiest Countries for 2022

Data Prep and Analysis For Factors of Happiness

- For this section we also grouped the data by country and averaged the data over 4 years.

- Then plotted factors of happiness against overall happiness scores.

- Finally using linear regression we found the equation of the line of best fit, Pearson's R and R squared.

Factors Of Happiness Scores

- Social Support is having others to turn to in a situation of crisis.

- The survey collected True and False answers from participants.

- We can gather that Social Support is strongly (and positively) correlated with happiness

Social support vs. Happiness Score

$y = 7.3x + -0.36$

R Value = 0.8
R squared = 0.64
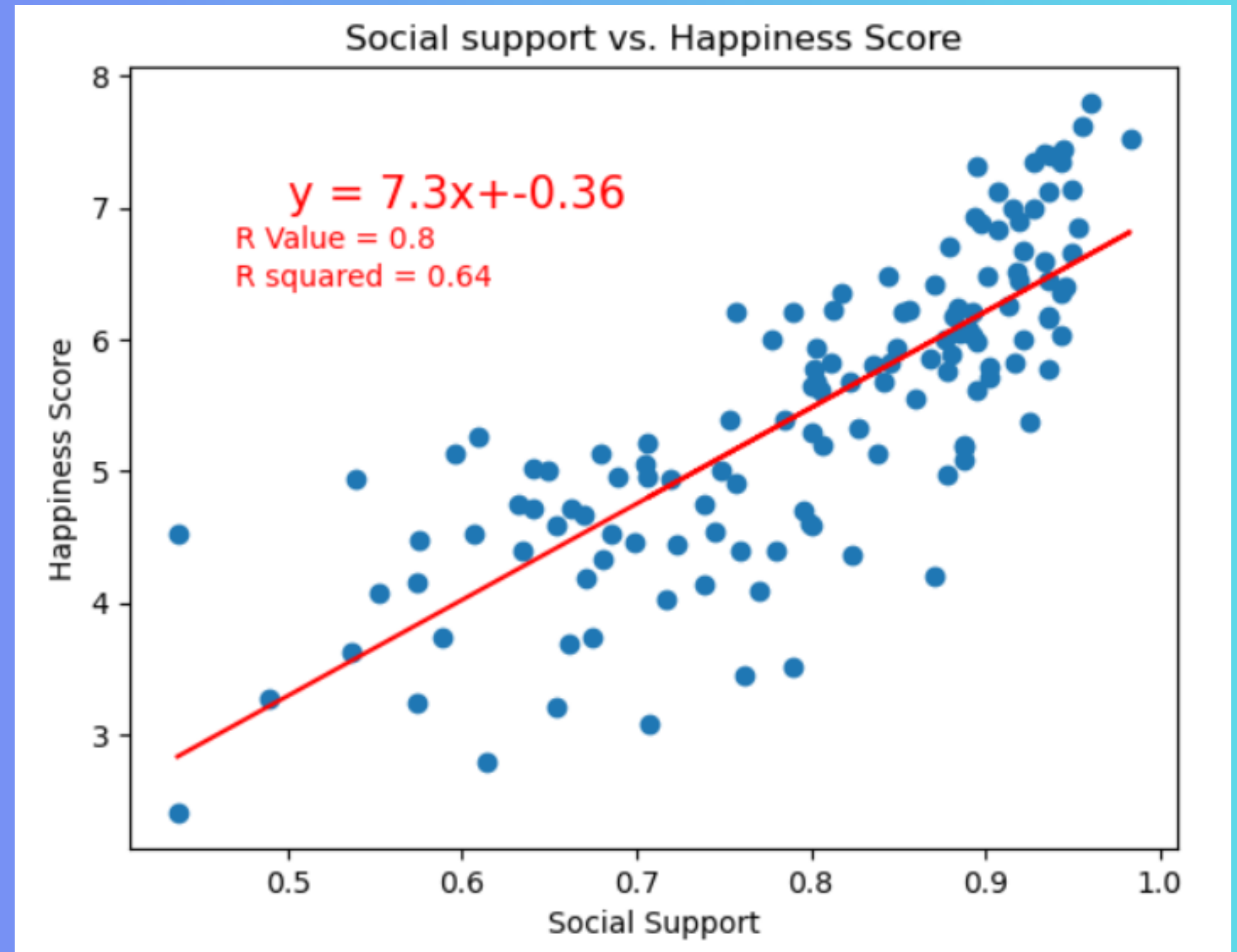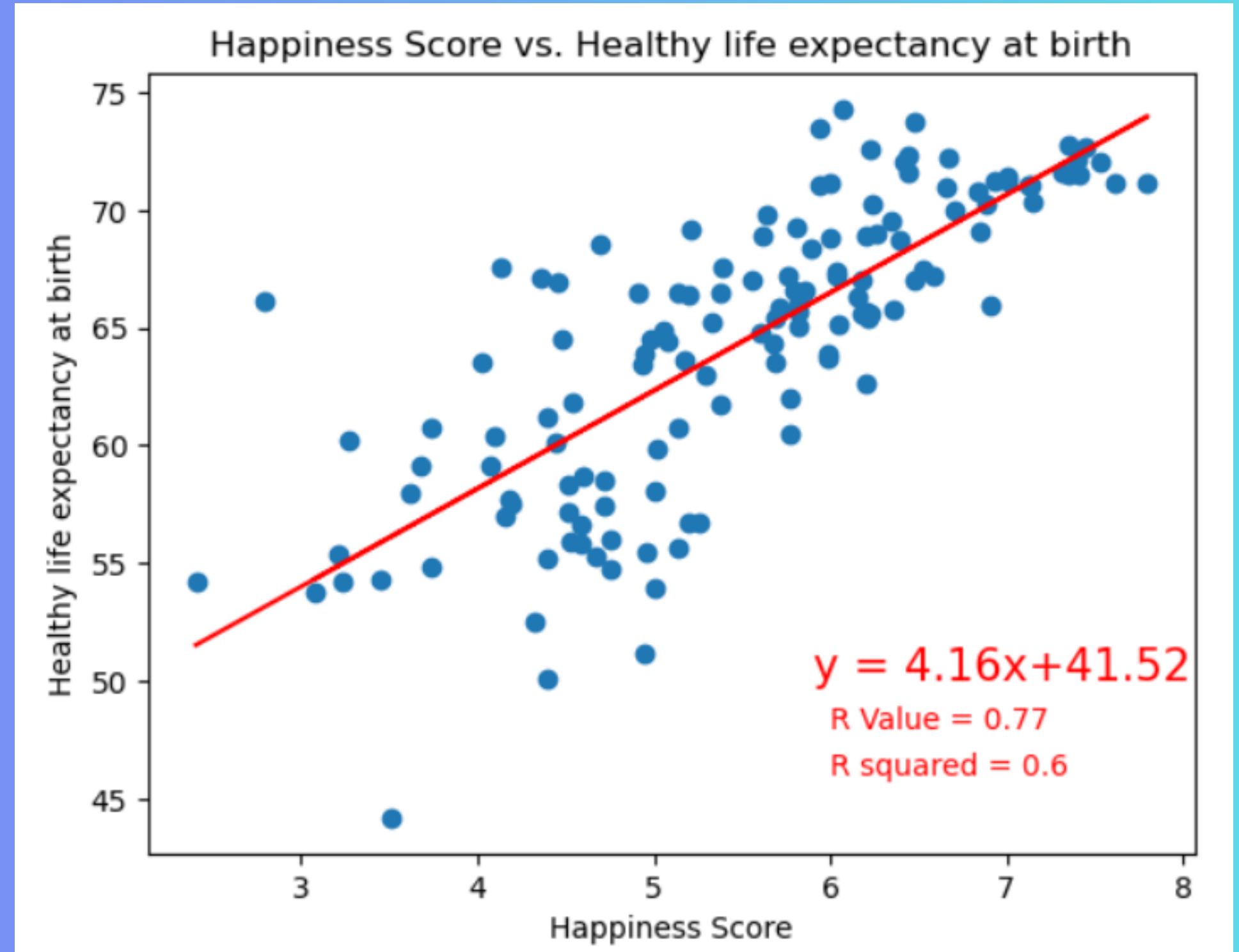
Factors Of Happiness Scores

- Perception of Corruption (in this survey) is the average of two questions:

- "Is there corruption widespread in your government"

- "Is there corruption widespread in business"

Note: If government corruption data was unobtainable, business corruption was used entirely

Perceptions of Corruption vs. Happiness Score

$y = -2.7x + 7.44$

R Value = -0.43

R squared = 0.19
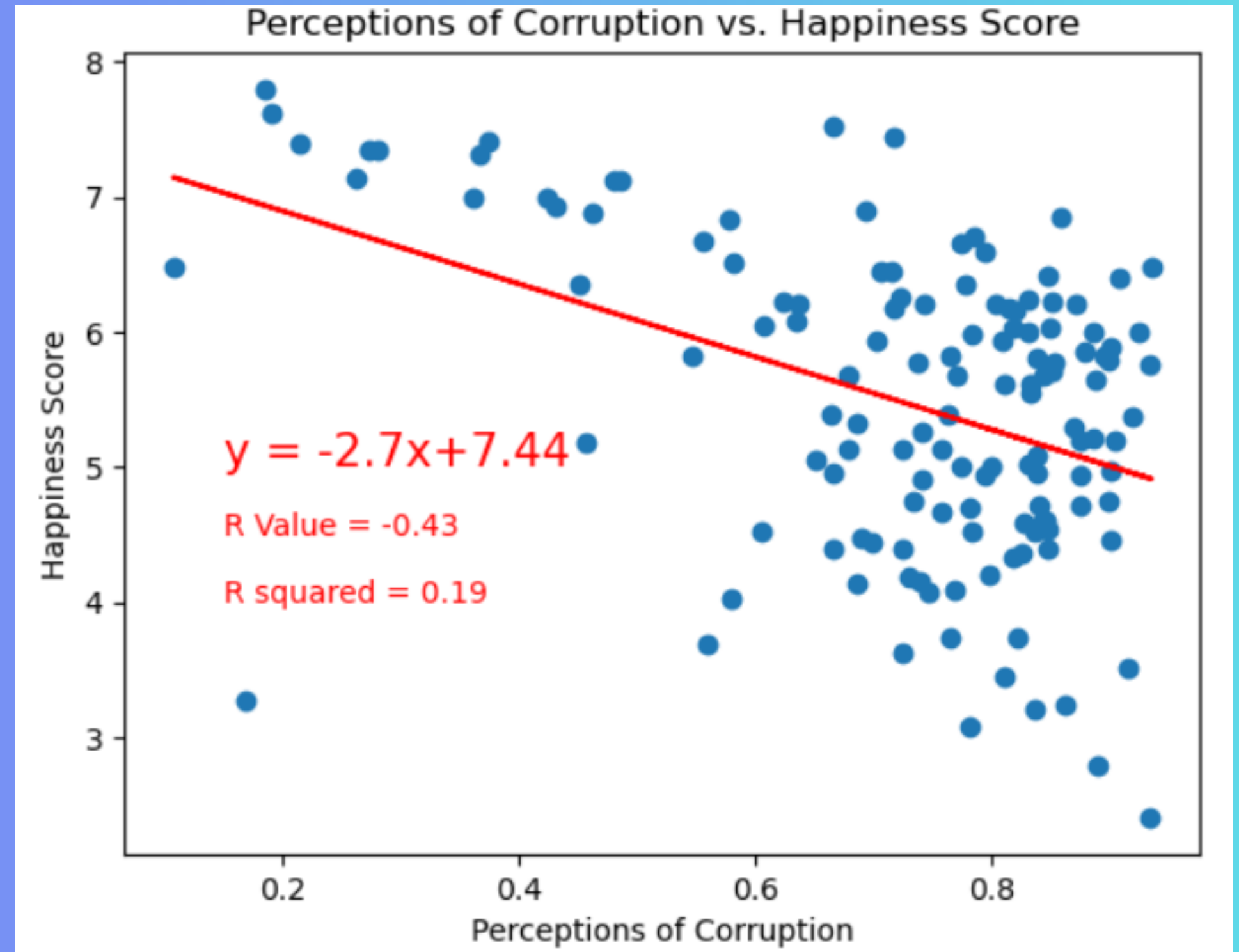
Happiness Compared to Life Expectancy

- Healthy Life Expectancy at Birth is defined as "The number of years of full health that a newborn is expected to live."

- This is calculated using World Health Organization's Global Health Observatory.

- Plotting Happiness Scores and Life Expectancy shows a strong positive correlation between the two.

Happiness Score vs. Healthy life expectancy at birth

$y = 4.16x + 41.52$
R Value = 0.77
R squared = 0.6

Our 3rd question relates to whether levels of happiness increased or decreased in the years 2019 - 2022. For this analysis we focused on the 5 top countries of happiness.

A line plot with markers was created to show the happiness scores for those countries in the 4 year timeframe.

- ○ **High happiness scores maintained over the timeframe.**

- ○ **Slight decrease in 2022 for all esp. Switzerland.**

Happiness Score of Selected Countries (2019-2022)
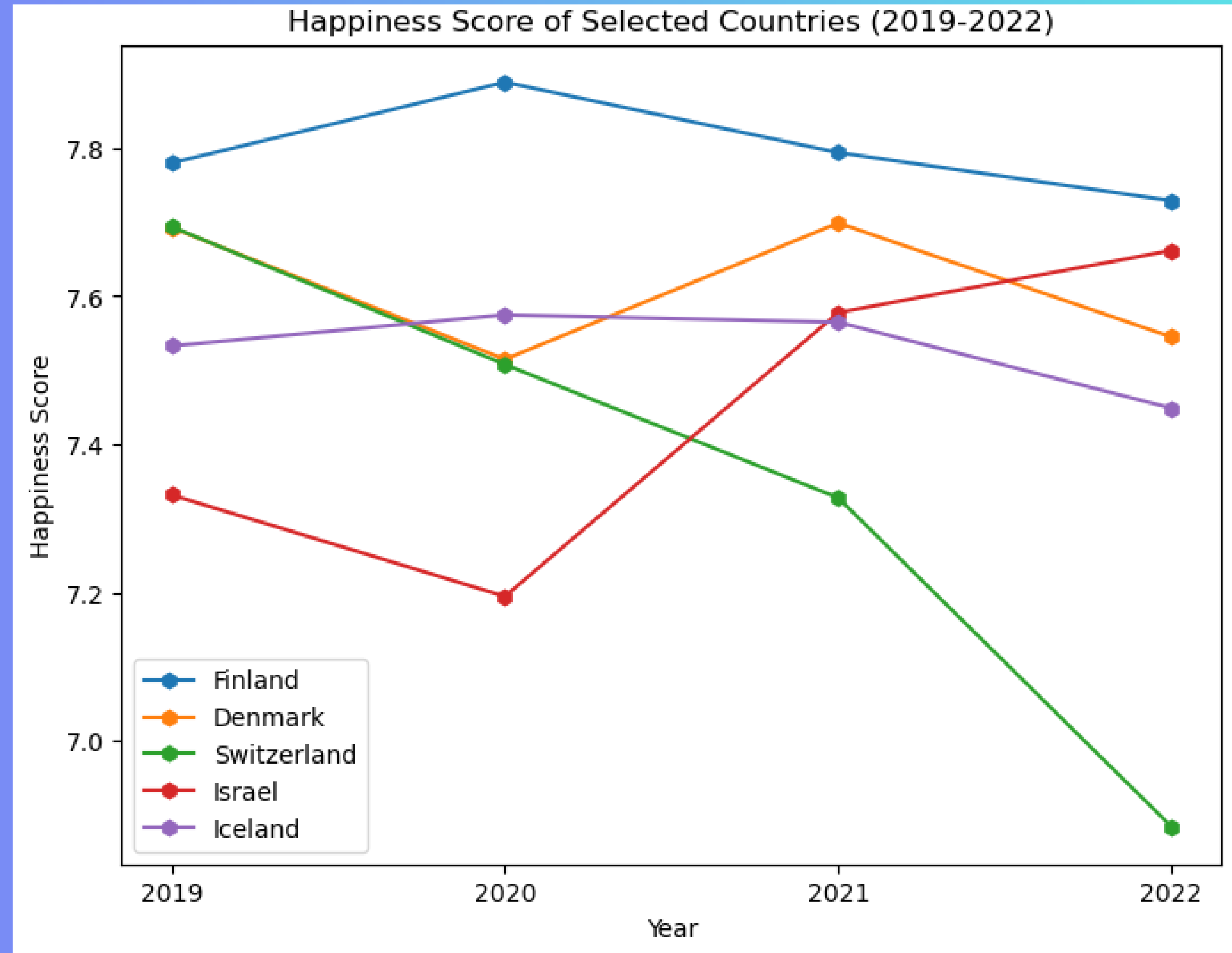
How did we arrive at this data?

First created a dataframe to include only the highest 5 countries in 2022 for comparison and created a List of countries.

 We then used the figure() function of matplotlib and created a for loop to iterate over each country in countries.

We also filtered the dataframe to include only the rows where the "Country Name" equals the country from the loop.

We did a plt.plot of the "Score" values from the above dataframe and our plt.xlabel, ylabel and title. Also used marker "h" which was found on matplotlib under markers to use a hexagon symbol to mark the specific score.

A bar chart shows the average Happiness Scores for the selected countries.

All 5 countries are very close in their average Happiness score.

Average Happiness Score of Selected Countries (2019-2022)
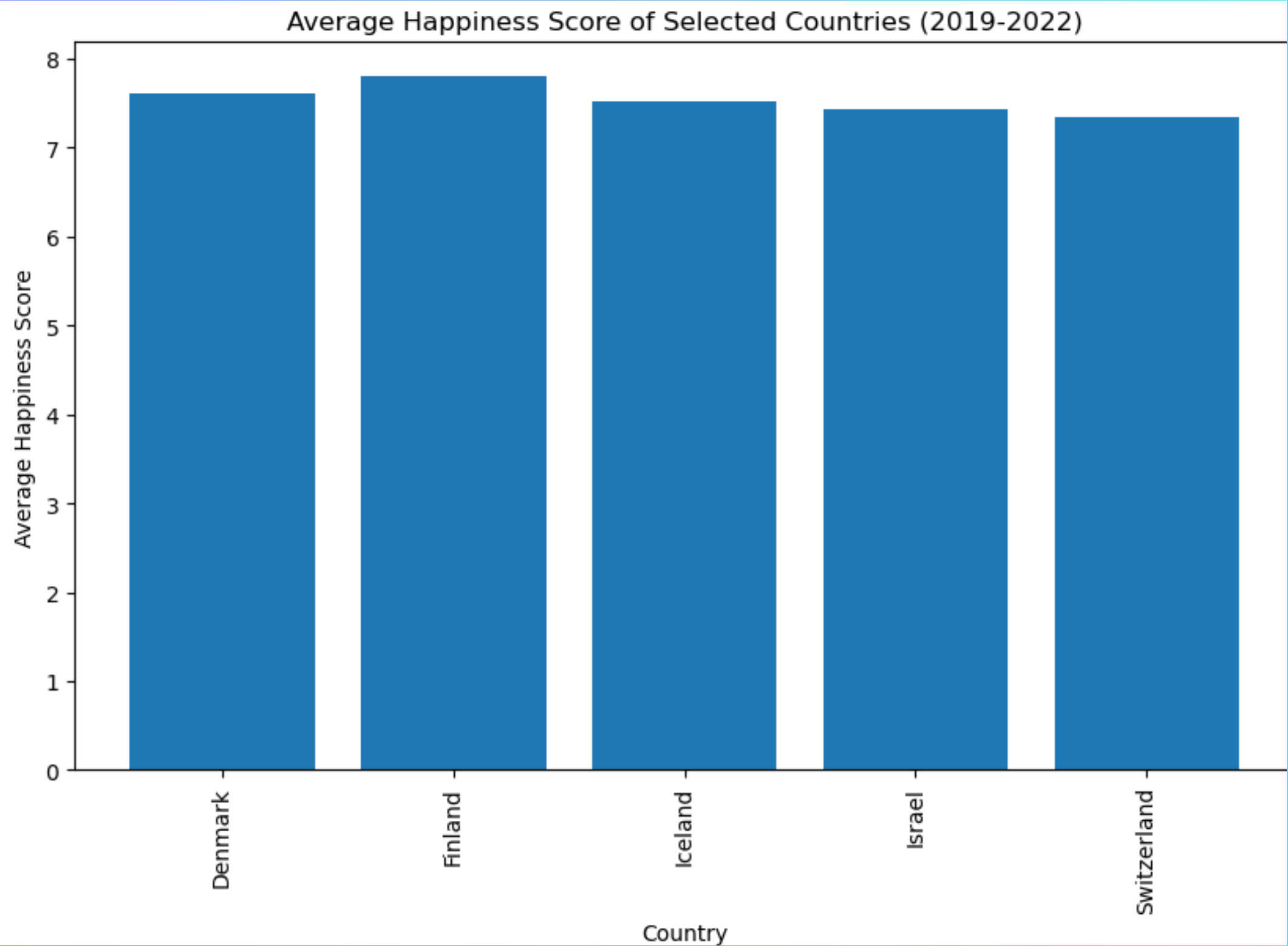
How did we arrive at this data?

We used plt.figure to create a bar chart. We grouped our dataframe and used groupby() function to group by "Country Name" and then took the average using mean() of the "Life Ladder" column.

This gave us a dataframe with the average for happiness score for our selected countries.

We then used plt.bar with index property for the x axis Country and values for y axis for Avg. Happiness Score.

For this consideration, we were interested in the amount of change for each country in 2019 and 2022 years again focusing on those same 4 selected countries.

Here is that drop we saw in the earlier slide for Switzerland in 2022. They were the country with the most change (decrease) in score.

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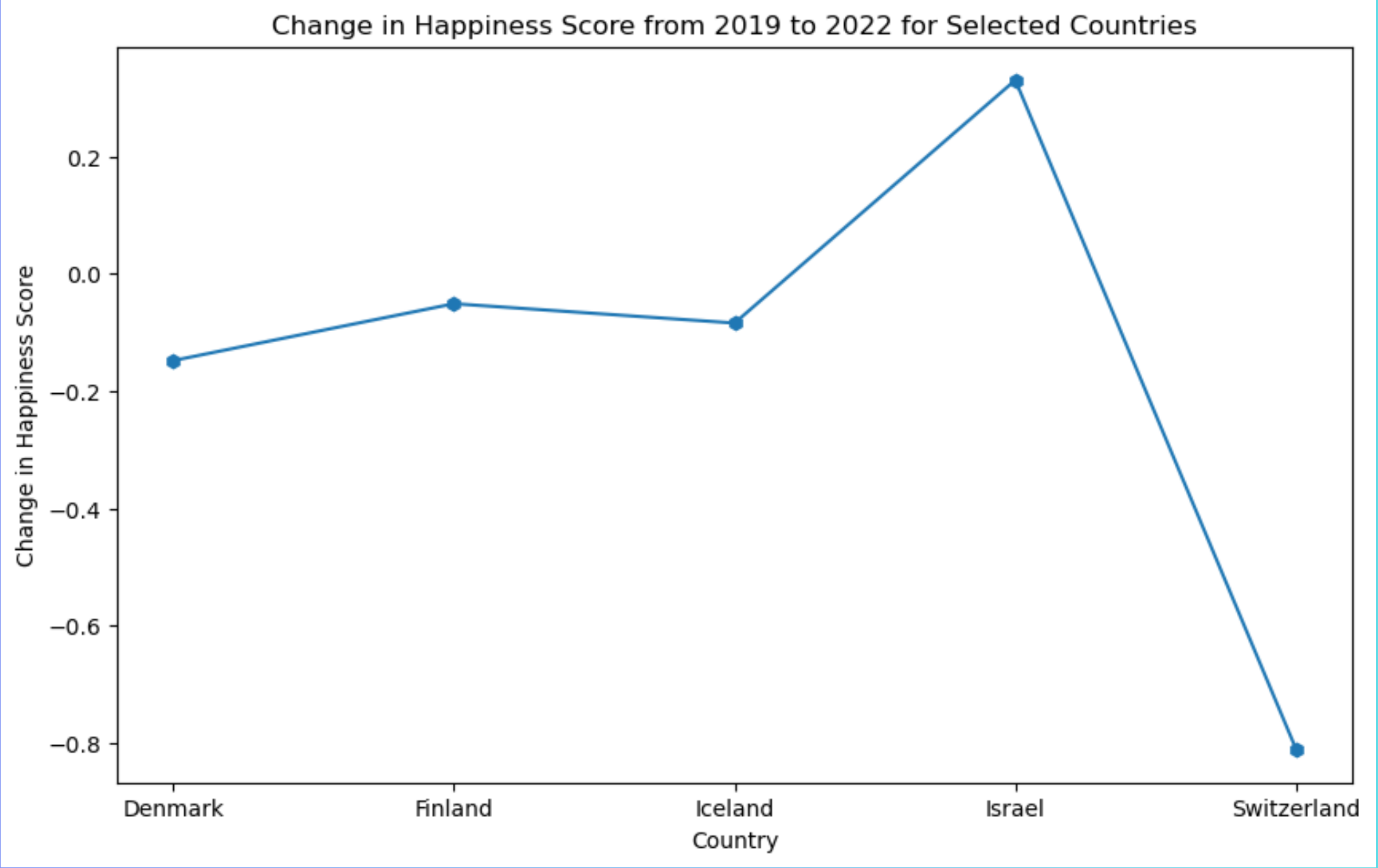
How did we arrive at this data?

Created a new dataframe filterd for 2019 and 2022 only. Then did a merge dataframe by Country Name for 2019 and 2022.

Then found the change in score from 2019 to 2022.

Results:

	Country Name	Happiness Score Change
0	Denmark	-0.148
1	Finland	-0.051
2	Iceland	-0.084
3	Israel	0.330
4	Switzerland	- 0.810

Created another Line plot from the merged dataframe which shows the amount of change from 2019 and 2022 for our selectred countries.

Conclusions and Summary

For purposes of this analysis and presentation, we narrowed our variables to include only perceived levels of Government Corruption and Social Support and saw some strong correlation with Social Support and Happiness Scores. We also considered Life Expectancy and saw a strong correlation with Happiness Score.

We acknowledge there are many more variables that can influence the Happiness Score. Also, not everyone views the definition of happiness the same way. The World Happiness Report however, as noted by a publication titled "Happiness and Life Satisfaction": is widely accepted as an effective means to measure people's perceptions of happiness.

As noted by a publication titled "Happiness and Life Satisfaction"
   Surveys asking people about life satisfaction and happiness do measure subjective well-being with reasonable accuracy.(1)

The "so what?" analysis point we concluded is we acknowledge that perceived levels of happiness vary by country with some at the higher ladder scores and others at lower end. Many factors go into influencing this Score and can lead to some surprising and some not so surprising findings.

Specifically, in the Healthcare industry, there is increasing interest in happiness and mental health. Finding what variables drive and influence happiness is of growing importance for those that study this data.

- Leads to how happiness levels can affect life expectancy.

- Funding for mental health programs. Health care can derive valuable insights to learn more about happiness levels and drivers behind happiness both on a global and local level.

(1) Source: https://ourworldindata.org/happiness-and-life-satisfaction

ANNUAL REVIEWS

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Happiness and Health

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Sections

Abstract

Research into the relationship between happiness and health is developing rapidly, exploring the possibility that impaired happiness is not only a consequence of ill-health but also a potential contributor to disease risk. Happiness encompasses several constructs, including affective well-being (feelings of joy and pleasure), eudaimonic well-being (sense of meaning and purpose in life), and evaluative well-being (life satisfaction). Happiness is generally associated with reduced mortality in prospective observational studies, albeit with several discrepant results. Confounding and reverse causation are major concerns. Associations with morbidity and disease prognosis have also been identified for a limited range of health conditions. The mechanisms potentially linking happiness with health include lifestyle factors, such as physical activity and dietary choice, and biological processes, involving neuroendocrine, inflammatory, and metabolic pathways. Interventions have yet to demonstrate substantial, sustained improvements in subjective well-being or direct impact on physical health outcomes. Nevertheless, this field shows great potential, with the promise of establishing a favorable effect on population health.

References:

https://worldhappiness.report/ed/2023/#appendices-and-data

https://www.health.harvard.edu/mind-and-mood/health-and-happiness-go-hand-in-hand

https://www.annualreviews.org/doi/10.1146/annurev-publhealth-040218-044150t

https://ourworldindata.org/happiness-and-life-satisfaction#mis-perceptions-about-others-happiness