



# World Happiness Report 2019

by Duc Pham



# World Happiness Report 2019 Dataset

Ranking	Country	Score	GDP_per_capita	Social_support	Health_life_expectancy	Freedom_to_make_life_choices	Generosity	Perception_of_corruption
1	Finland	7.769	1.340	1.587	0.986	0.596	0.153	0.053
2	Denmark	7.600	1.383	1.573	0.996	0.592	0.252	0.044
3	Norway	7.554	1.488	1.582	1.028	0.603	0.271	0.042
4	Iceland	7.494	1.380	1.624	1.026	0.591	0.354	0.038
5	Netherlands	7.488	1.396	1.522	0.999	0.557	0.322	0.037
6	Switzerland	7.480	1.452	1.526	1.052	0.572	0.263	0.036
7	Sweden	7.343	1.387	1.487	1.009	0.574	0.267	0.035
8	New Zealand	7.307	1.303	1.557	1.026	0.585	0.330	0.034
9	Canada	7.278	1.365	1.505	1.039	0.584	0.285	0.033
10	Austria	7.246	1.376	1.475	1.016	0.532	0.244	0.032
11	Australia	7.228	1.372	1.548	1.036	0.557	0.332	0.031
12	Costa Rica	7.167	1.034	1.441	0.963	0.558	0.144	0.030
13	Israel	7.139	1.276	1.455	1.029	0.371	0.261	0.029
14	Luxembourg	7.090	1.609	1.479	1.012	0.526	0.194	0.028
15	United Kingdom	7.054	1.333	1.538	0.996	0.450	0.348	0.027
16	Ireland	7.021	1.499	1.553	0.999	0.516	0.298	0.026
17	Germany	6.985	1.373	1.454	0.987	0.495	0.261	0.025
18	Belgium	6.923	1.356	1.504	0.986	0.473	0.160	0.024

A thick yellow diagonal stripe runs from the top right corner towards the bottom left, separating the white background from a solid yellow background on the right.

1.

EXPLAINING THE DATASET

- The dataset has **156 observations** and **9 variables**.

- 156 observations: 156 countries

- 9 variables:

+ Ranking	+ GDP per capita	+ Freedom to make life choices
+ Country	+ Social support	+ Generosity
+ Score	+ Health life expectancy	+ Perception of corruption

- Economic development is only a part of the story. To what extent are factors such as **Social support, Health life expectancy**,... associated with **Happiness Score**?

A thick, bright yellow diagonal stripe runs from the top right corner towards the bottom left, separating the white background on the left from a solid yellow background on the right.

# 2.

STATING THE PROBLEMS

# PROBLEMS

1.

Top **5** countries have **highest** and **lowest** happiness score.

2.

Correlation between **Happiness Score** and **GDP per capita**, **Social support**, **Health life expectancy**, ...

3.

With linear regression, predict a country's **Happiness Score** based on specific features.

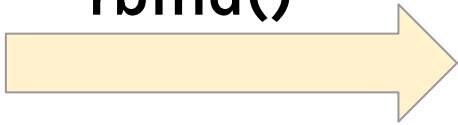
Score
7.769
7.600
7.554
7.494
7.488

Top 5 Happiest Country  
Happiness Score

Score
3.334
3.231
3.203
3.083
2.853

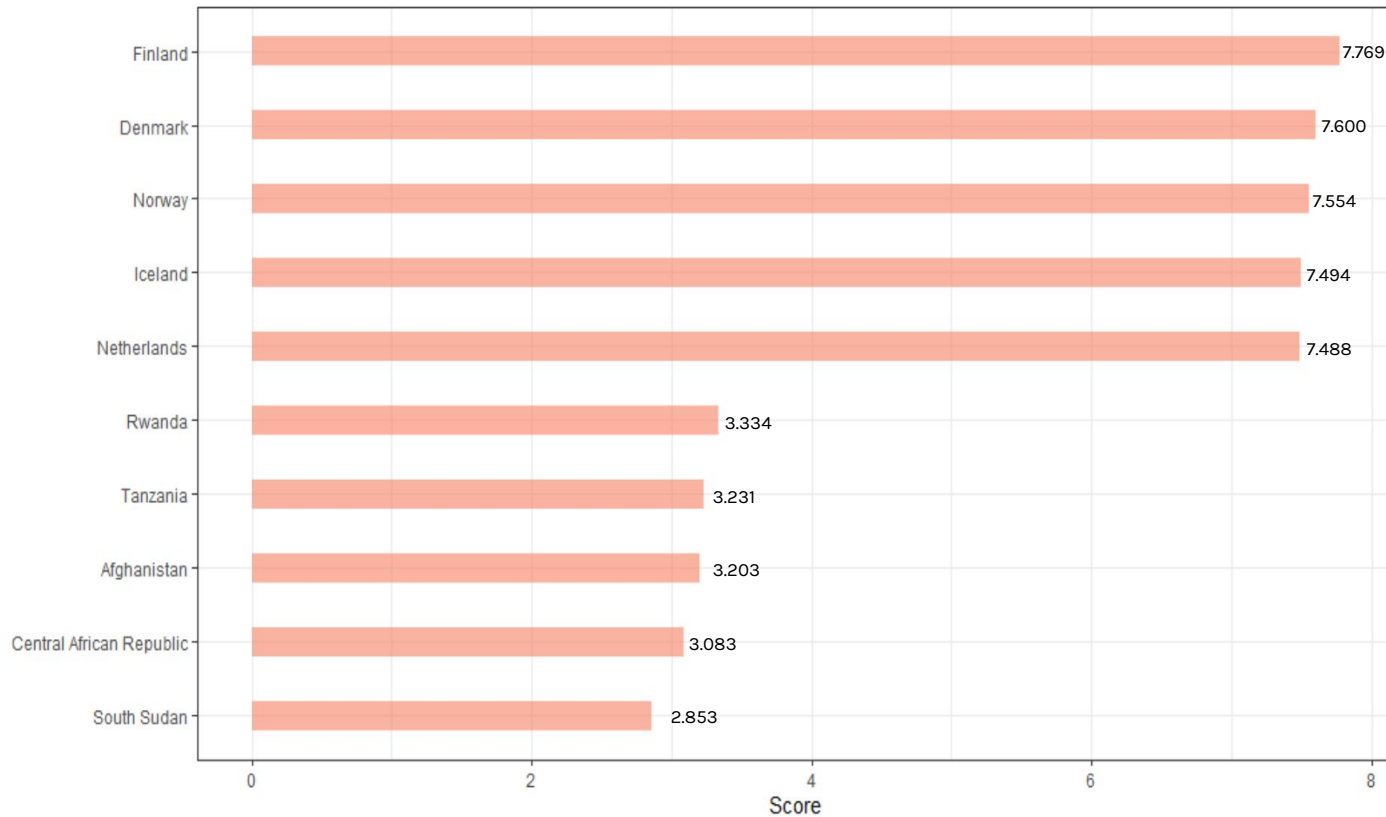
Top 5 Unhappiest Country  
Happiness Score

**rbind()**



Score
7.769
7.600
7.554
7.494
7.488
3.334
3.231
3.203
3.083
2.853

# Top 5 Happiest & Unhappiest Countries in the World





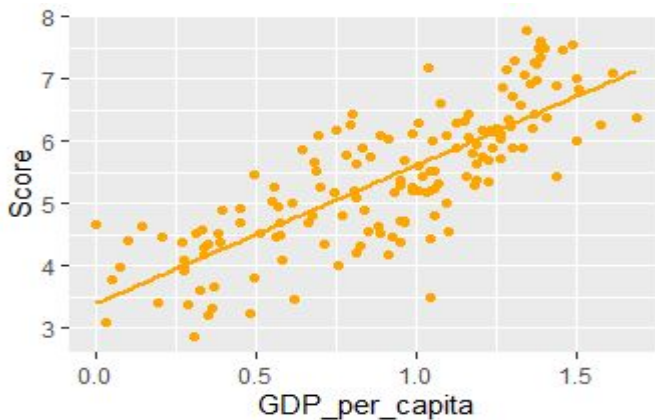
**mean(Score) = 5.407096**

In 156 countries observed,  
there are:

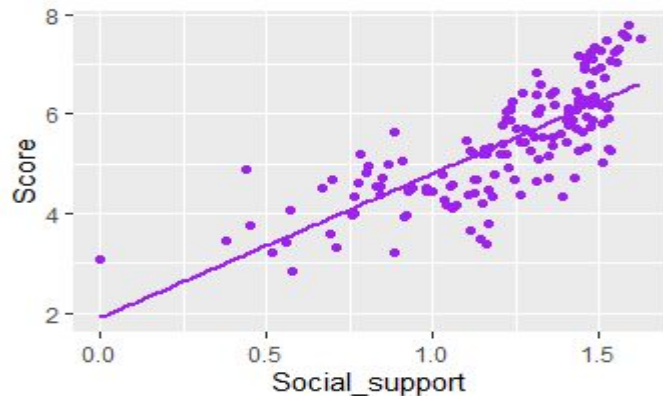
- 77 countries have score above the average
- 79 countries have below

	Country	Score	Level
1	Finland	7.769	Above
2	Denmark	7.600	Above
3	Norway	7.554	Above
4	Iceland	7.494	Above
5	Netherlands	7.488	Above
6	Switzerland	7.480	Above
7	Sweden	7.343	Above
8	New Zealand	7.307	Above
9	Canada	7.278	Above
10	Austria	7.246	Above
11	Australia	7.228	Above
12	Costa Rica	7.167	Above
13	Israel	7.139	Above
14	Luxembourg	7.090	Above
15	United Kingdom	7.054	Above
16	Ireland	7.021	Above
17	Germany	6.985	Above
18	Belgium	6.923	Above
19	United States	6.892	Above

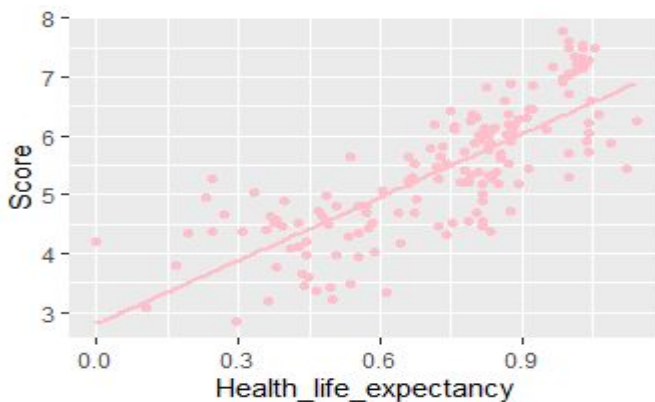
# Correlation between happiness score and some specific variables



$\text{cor}(\text{GDP\_per\_capita}, \text{Score}) = 0.7938829$



$\text{cor}(\text{Social\_support}, \text{Score}) = 0.7770578$



$\text{cor}(\text{Health\_life\_expectancy}, \text{Score}) = 0.7798831$



# LINEAR MODEL

Call:  
lm(formula = Score ~ . - Ranking - Country, data = happiness)

Residuals:

Min	1Q	Median	3Q	Max
-1.75304	-0.35306	0.05703	0.36695	1.19059

Coefficients:

	Estimate	Std. Error	t value	Pr(> t )	
(Intercept)	1.7952	0.2111	8.505	1.77e-14	***
GDP_per_capita	0.7754	0.2182	3.553	0.000510	***
Social_support	1.1242	0.2369	4.745	4.83e-06	***
Health_life_expectancy	1.0781	0.3345	3.223	0.001560	**
Freedom_to_make_life_choices	1.4548	0.3753	3.876	0.000159	***
Generosity	0.4898	0.4977	0.984	0.326709	
Perception_of_corruption	0.9723	0.5424	1.793	0.075053	.


---  
signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 0.5335 on 149 degrees of freedom  
Multiple R-squared: 0.7792, Adjusted R-squared: 0.7703  
F-statistic: 87.62 on 6 and 149 DF, p-value: < 2.2e-16

A thick yellow diagonal stripe runs from the top right corner towards the bottom left, separating the white background from a solid yellow background.

3.

CONCLUSION

A hand is shown writing on a green chalkboard with a piece of chalk. The chalkboard has some faint, illegible writing on it. The hand is positioned in the lower right quadrant of the image, and the chalk is held between the thumb and index finger. The background is slightly blurred, showing what appears to be a bookshelf or a similar structure.
$$\begin{aligned}\text{Happiness Score} = & 1.7952 + \\ & 0.7754 * \text{GDP\_per\_capita} + \\ & 1.1242 * \text{Social\_support} + \\ & 1.0781 * \text{Health\_life\_expectancy} + \\ & 1.4548 * \text{Freedom\_to\_make\_life\_choices} + \\ & 0.4898 * \text{Generosity} + \\ & 0.9723 * \text{Perception\_of\_corruption}\end{aligned}$$

Assume we have a country that has these numeric values:

```
GDP_per_capita <- 1.2  
Social_support <- 1.3  
Health_life_expectancy <- 0.9  
Freedom_to_make_life_choices <- 0.5  
Generosity <- 0.2  
Perception_of_corruption <- 0.4
```

➡ ***Happiness Score = 6.37171***

**THANKS!**