

ENSF 592

Spring 2023

Final Project Report

Group #1

By

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Introduction

The Happiness Game is a CLI application developed to test your knowledge of countries and provide interesting statistics for you to learn. The game is developed using data from the World Happiness Report, which is an annual publication that publishes a variety of measures for every country in the world. The World Happiness Report tries to measure the success of countries in a more holistic approach than would be shown from using GDP alone as a measure.

Instructions:

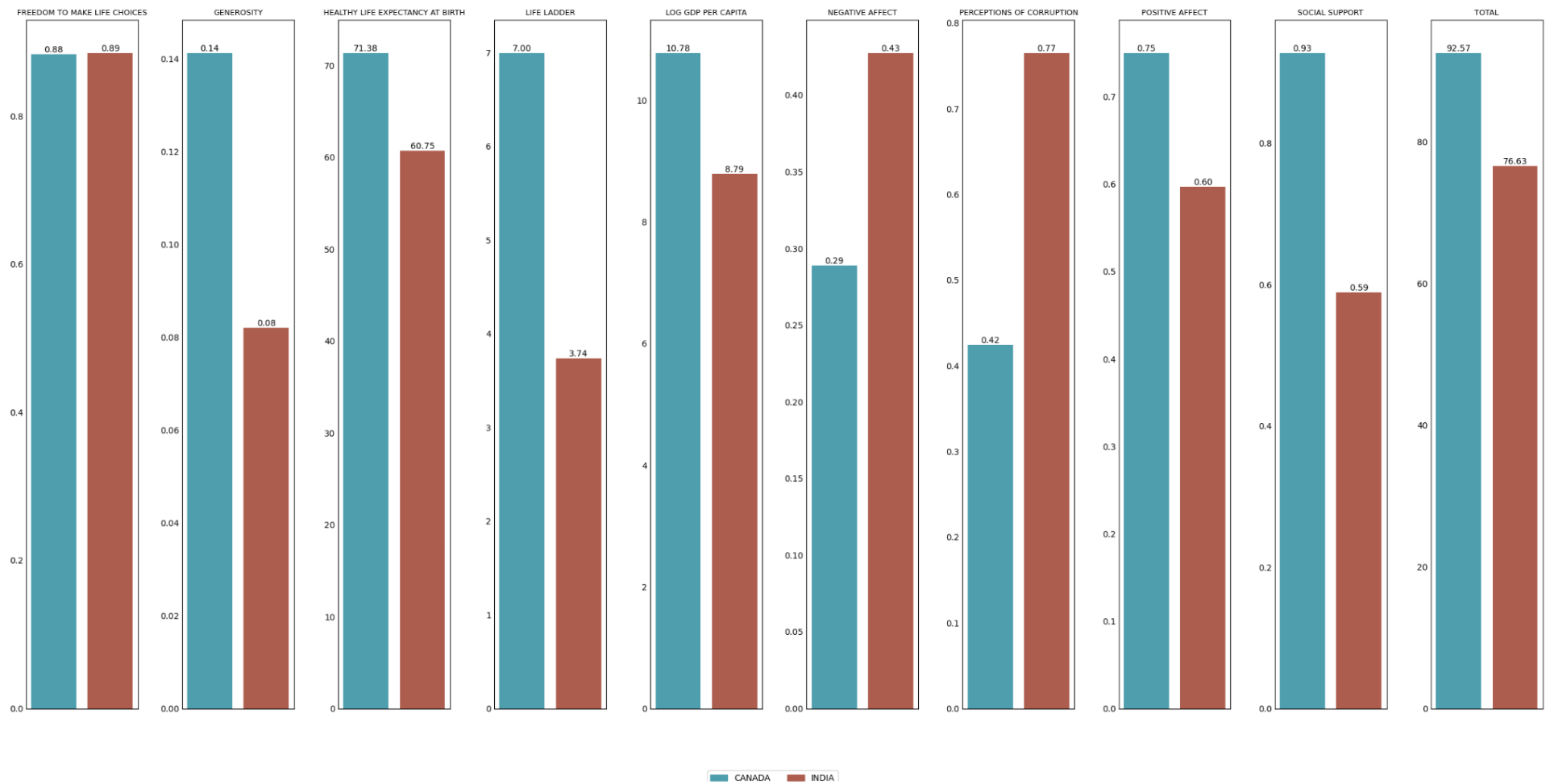
1. The program will pick a random country and present the country name to the user
2. The user will have to guess a country that has a higher overall world happiness rank than the randomly generated country
3. The program then graphs a comparison between the two countries across all metrics reported by the World Happiness Report
4. Then the user is prompted to enter any metric they are most interested in
5. The program then shows the top 5 and bottom 5 countries for the user input metric
 - a. The program also displays statistical information regarding the mean, max, and minimum for the chosen metric
6. Program ends

Features Meeting the Rubric:

1. Four data sets (year_2019, year_2020, year_2021, and year_2022) are imported and concatenated into one multi-index dataframe,
 - a. indexed on Country Name and Year
 - b. The full dataframe is changed to a pivottable & removes duplicate index values
2. Aggregate function is used on the total dataframe to add a new column 'Total' for each country
3. A second column labeled 'Rank' is added to the overall dataframe
4. The modified full dataframe is sorted by Rank to generate the overall rankings in order
5. The entire dataframe is grouped by country name and the mean is taken across all 4 years of data so that countries can be compared across an average of 4 years of data
6. The code is formatted into Three classes:
 - a. The Data class accepts the excel data and organizes it into a useful format ready to play the happiness game
 - b. The HappinessGame class picks a random country in order to start playing the guessing game
 - c. The User class accepts the user input and compares it against the randomly generated country to determine a win / loss
7. The program can throw a key value error and re-prompt the user for input if they enter an incorrect country name or metric name.
8. The user input is not case sensitive. The program can handle any case of user input.
9. A masking operation is used to extract only the randomly generated country data from the whole dataset

Graphs

The example graphs are produced when the randomly generated country is India, while the user input country is Canada. This produces a win since Canada is ranked higher than India in the World Happiness Report.



Typical Game Play

```
(base) nick@Nicks-MacBook-Air 592p23-project-p23-group-1 % conda activate ensf592
(ensf592) nick@Nicks-MacBook-Air 592p23-project-p23-group-1 % python happiness.py
Intel MKL WARNING: Support of Intel(R) Streaming SIMD Extensions 4.2 (Intel(R) SSE4.2) enabled only processors has been deprecated. Intel oneAPI Math Kernel Library 2025.
Advanced Vector Extensions (Intel(R) AVX) instructions.
Intel MKL WARNING: Support of Intel(R) Streaming SIMD Extensions 4.2 (Intel(R) SSE4.2) enabled only processors has been deprecated. Intel oneAPI Math Kernel Library 2025.
Advanced Vector Extensions (Intel(R) AVX) instructions.

***** WORLD HAPPINESS GAME *****

The World Happiness Game combines data from the World Happiness report and creates a guessing game to test your knowledge of the world. Good luck!

Instructions:
1. One country will be chosen at random.
2. The goal of the game is to pick a country with a higher World Happiness Score than the chosen country.
3. If you picked a country that is ranked higher than the randomly generated country, you win!

Example:
1. The program picks 'Albania' as the country, which has a mean Rank associated from the years 2019 - 2022.
2. Your goal is to pick a country that you think would rank higher than Albania.
3. If you choose Finland, you win.

Please guess a country that has a higher overall World Happiness Ranking than PAKISTAN: canada

Congragulation! You win!

Please see the table below and figure for comparison of all categories for these 2 countries.
You can close the plot afterwards to continue the Program.

      RANK  FREEDOM TO MAKE LIFE CHOICES  GENEROSITY  HEALTHY LIFE EXPECTANCY AT BIRTH  ...  PERCEPTIONS OF CORRUPTION  POSITIVE AFFECT  SOCIAL SUPPORT  TOTAL
COUNTRY NAME
CANADA      16      0.883750      0.141250      71.375      ...      0.424      0.750250      0.927750  92.56875
PAKISTAN    118      0.738667      0.043667      57.175      ...      0.784      0.492333      0.606333  73.27000

[2 rows x 11 columns]

Please select a category from the below to see who ranks the highest and lowest in the category:

FREEDOM TO MAKE LIFE CHOICES
GENEROSITY
HEALTHY LIFE EXPECTANCY AT BIRTH
LIFE LADDER
LOG GDP PER CAPITA
NEGATIVE AFFECT
PERCEPTIONS OF CORRUPTION
POSITIVE AFFECT

Enter category: life ladder

The highest ranked countries for LIFE LADDER are:

      LIFE LADDER
COUNTRY NAME
FINLAND      7.79800
DENMARK      7.61300
ICELAND      7.53050
ISRAEL       7.44175
NETHERLANDS  7.40825
```

Enter category: life ladder

The highest ranked countries for LIFE LADDER are:

COUNTRY NAME	LIFE LADDER
FINLAND	7.79800
DENMARK	7.61300
ICELAND	7.53050
ISRAEL	7.44175
NETHERLANDS	7.40825

The lowest ranked countries for LIFE LADDER are:

COUNTRY NAME	LIFE LADDER
AFGHANISTAN	2.030667
LEBANON	2.797250
ZIMBABWE	3.076250
CONGO (KINSHASA)	3.207000
SIERRA LEONE	3.240333

The mean, min, and max for the category LIFE LADDER are:

mean	5.516385
min	2.030667
max	7.798000

Thanks for playing!

(ensf592) nick@Nicks-MacBook-Air 592p23-project-p23-group-1 %

References

1. J. F. Helliwell, R. Layard, J. D. Sachs, J.E. De Neve, L. B. Aknin, and S. Wang, Eds., "World Happiness Report 2022". New York: Sustainable Development Solutions Network, 2022.
2. J. F. Helliwell, R. Layard, J.D. Sachs, and J.E. De Neve, Eds., "World Happiness Report 2021". New York: Sustainable Development Solutions Network, 2021.
3. J. F. Helliwell, R. Layard, J. Sachs, and J.E. De Neve, Eds., "World Happiness Report 2020". New York: Sustainable Development Solutions Network, 2020.
4. J.F. Helliwell, R. Layard, and J. Sachs, "World Happiness Report 2019," New York: Sustainable Development Solutions Network, 2019.