**ASSIGNMENT 5 (09/09/25)**

**DESCRIPTION OF EACH COLUMN OF WORLD HAPPINESS REPORT**

**Description of Countries**

The survey on happiness covers 147 countries worldwide, representing a broad mix of regions, cultures, and levels of economic development. Countries are included from every continent:

* Europe – with many of the highest-scoring nations such as Finland, Denmark, Iceland, Switzerland, and the Netherlands.
* North and South America – including both developed nations like the United States, Canada, and Mexico, and developing ones such as Brazil, Argentina, and Honduras.
* Asia – featuring a wide range of countries from high-income economies like Japan, Singapore, and South Korea to lower-income nations such as India, Nepal, and Afghanistan.
* Middle East and North Africa – including countries like Israel, Saudi Arabia, the United Arab Emirates, and Egypt.
* Sub-Saharan Africa – represented by nations such as Nigeria, Ghana, Kenya, South Africa, and Malawi.
* Oceania – including Australia and New Zealand

**Description of Happiness Score and Rank**

The **Happiness Score** reflects how satisfied people are with their lives in a given country. It is based on survey responses to the Cantril Ladder question, where individuals rate their current life on a scale from **0 (worst possible life)** to **10 (best possible life)**. The average of these responses across the population becomes the country’s Happiness Score. Higher scores indicate greater overall life satisfaction and well-being among citizens.

The **Happiness Rank** orders countries from the happiest to the least happy, based on their Happiness Scores. For example, in this dataset, **Finland ranks 1st with a score of 7.736**, making it the happiest country, while **Afghanistan ranks 147th with a score of 1.364**, reflecting the lowest reported well-being.

Several key factors help explain differences in these scores across countries, including **GDP per capita, social support, healthy life expectancy, freedom to make life choices, generosity, and perceptions of corruption**. Together, these dimensions highlight not only material wealth but also the importance of trust, community, and health in shaping happiness worldwide.

**Log GDP per Capita (in the Happiness Report)**

1. **What it means**
   * This is a measure of a country’s **economic output per person**, adjusted for purchasing power (so cost of living differences between countries are considered).
   * Instead of using raw GDP per capita, the **natural logarithm (log)** of the value is taken.
   * Using the log makes comparisons fairer, because the effect of income on well-being **diminishes at higher levels of wealth**.
     + Example: An increase from $1,000 → $2,000 has a bigger impact on happiness than an increase from $30,000 → $31,000.
2. **Why use log GDP?**
   * It reflects the principle of **diminishing returns**: as income grows, each additional dollar contributes less to happiness.
   * It also keeps extreme values (like very rich countries) from skewing the data.

**Formula for Log GDP per Capita**

Log GDP per capita=ln (GDP (PPP)Population) \text {Log GDP per capita} = \ln \left (\frac {\text {GDP (PPP)}}{\text {Population}} \right) Log GDP per capita=ln (Population GDP (PPP)​)

Where:

* **GDP (PPP)** = Gross Domestic Product adjusted for **Purchasing Power Parity** (constant 2017 international dollars).
* **Population** = total number of people in the country.
* **ln** = natural logarithm (base *e*).

**Social Support (Definition)**

* **Social support** measures whether people feel they have **someone they can rely on in times of trouble**.
* It reflects **community strength, trust, and personal networks** — not just family, but also friends and wider social bonds.

**How It’s Calculated**

The indicator is derived from the **Gallup World Poll** survey question:

“**If you were in trouble, do you have relatives or friends you can count on to help you whenever you need them, or not?**”

* Responses are **Yes (1)** or **No (0)**.
* For each country, the **percentage of respondents saying “Yes”** is calculated.
* This proportion is then used in the model, scaled between **0 and 1**.

**Example**

* If 92% of people in Country A said *“Yes, I have someone I can rely on”*:

Social Support Score=0.92\text {Social Support Score} = 0.92Social Support Score=0.92

* If only 62% of people in Country B said “Yes”:

Social Support Score=0.62\text {Social Support Score} = 0.62Social Support Score=0.62

**What is Healthy Life Expectancy?**

* **Healthy Life Expectancy (HLE)** = the **average number of years a person can expect to live in good health**, free from serious illness or disability.
* It’s different from just *life expectancy at birth* because it adjusts for **quality of health**, not just survival.

**How It’s Calculated**

The World Happiness Report uses **data from the World Health Organization (WHO)**:

HLE=Life Expectancy at Birth−Years Lived with Disability (YLD)\text {HLE} = \text {Life Expectancy at Birth} - \text {Years Lived with Disability (YLD)} HLE=Life Expectancy at Birth−Years Lived with Disability (YLD)

Where:

* **Life Expectancy at Birth** = average years a newborn is expected to live.
* **YLD (Years Lived with Disability)** = average years spent in less than full health (disease, injury, disability).

WHO produces global estimates for both **LE** and **YLD** by country. The resulting **Healthy Life Expectancy** values are then scaled and included in the Happiness Report model.

**What is “Freedom to make life choices”?**

* This measures whether people feel **free to choose what they do with their lives** — including work, living arrangements, and personal decisions.
* It reflects **personal autonomy** and the **sense of control** over one’s future.

**How It’s Calculated**

It comes directly from the **Gallup World Poll survey question**:

**“Are you satisfied or dissatisfied with your freedom to choose what you do with your life?”**

* Responses: **1 (Yes, satisfied)** or **0 (No, dissatisfied)**.
* For each country, the proportion of “Yes” responses is calculated.
* This proportion is then used as the **Freedom score**, usually scaled between **0 and 1**.

**What is Generosity?**

* **Generosity** measures the extent to which people are willing to **help others**.
* It reflects **prosocial behavior** such as donating to charity, volunteering, or helping strangers

**How It’s Calculated**

The indicator comes from the **Gallup World Poll survey question**:

**“Have you donated money to a charity in the past month?”**

* Responses: **Yes (1)** or **No (0)**.
* For each country, the **share of “Yes” responses** is calculated.

But here’s the key:

* The raw donation data is **adjusted for GDP per capita**, because wealthier people are naturally able to donate more.
* This adjustment isolates the **pure generosity effect** (i.e., willingness to give regardless of income).

**Perceptions of Corruption (Definition)**

* This indicator reflects how much people **trust their government and businesses**, and whether they believe these institutions are **corrupt**.
* It’s a measure of **institutional trust and integrity**.

**How It’s Calculated**

It comes from **two Gallup World Poll survey questions**:

1. **“Is corruption widespread throughout the government in this country, or not?”**
2. **“Is corruption widespread within businesses in this country, or not?”**

* Responses: **Yes (1)** or **No (0)**.
* The proportion of people saying **“No” (corruption is not widespread)** is taken.
* The **average of the two questions** (government + business) is used as the country’s corruption perception score.

This gives a value between **0 (no trust, high corruption)** and **1 (high trust, low corruption)**.

**What is “Dystopia”?**

* In the World Happiness Report, **Dystopia** is a **hypothetical country** — the “worst possible place to live.”
* It is not a real country, but a **benchmark** used to make comparisons fair.
* Dystopia is assigned the **lowest observed values** for each factor (GDP, Social Support, Healthy Life Expectancy, Freedom, Generosity, Perceptions of Corruption).

This way, every country is compared against the *worst possible life scenario*.

**What is “Residual”?**

* Even after accounting for all the measurable factors (income, health, trust, etc.), some part of happiness cannot be explained by the model.
* That unexplained part is called the **residual**.
* It captures influences such as **culture, history, mental health, inequality, climate, and other unmeasured factors**.

**How It’s Calculated**

The **Happiness Score** is modelled as: Happiness Score = Dystopia + Residual+(b1​⋅Log GDP) +(b2​⋅Social Support) +(b3​⋅Healthy Life Expectancy) +(b4​⋅Freedom) +(b5​⋅Generosity) +(b6​⋅Perceptions of Corruption)

Where:

* b1, b2, b6b\_1, b\_2, ..., b\_6b1​, b2​..., b6​ are regression coefficients.
* **Dystopia + Residual** = what’s left after subtracting the contributions of the six main factors from the total Happiness Score.