**Final Conclusion of the Project**

This project aimed to analyze and predict the **Quality of Life** across different countries using various socioeconomic and environmental factors. Through data preprocessing, feature engineering, and machine learning modeling, we gained valuable insights into what truly impacts Quality of Life.

Key takeaways:

1. **Most Influential Factors**:
   * Climate Value:
     1. A favorable climate enhances well-being by reducing health risks (e.g., extreme cold or heat).
     2. It supports outdoor activities and improves overall living comfort.
     3. Many global quality-of-life rankings consider climate a major factor due to its impact on physical and mental health.
   * Income-to-Property Ratio:
     1. Economic Perspective: If income is high relative to property prices, housing becomes more affordable, allowing for better living conditions without excessive financial strain.
     2. Quality of Life Connection: Affordable housing reduces financial stress and enables better allocation of income toward essential needs such as healthcare, education, and leisure, contributing to a higher quality of life.
   * Purchasing Power Value
     1. This factor also positively influences Quality of Life, confirming that economic stability plays a crucial role in living conditions.
     2. Logical Reasoning:
        1. Higher purchasing power allows individuals to afford better healthcare, nutritious food, quality education, and recreational activities, all of which contribute to a healthier and more fulfilling lifestyle.
        2. It enhances financial security, reducing stress and increasing overall satisfaction.
        3. Economic stability leads to improved access to goods and services, directly impacting well-being and overall life satisfaction.
2. **Outlier Handling & Feature Engineering**:
   * Outlier Handling & Feature Engineering:
   * We experimented with outlier removal, but strict thresholds eliminated too much data, leading to reconsideration.
3. **Machine Learning & Model Interpretability**:
   * The model effectively predicted Quality of Life scores, with SHAP analysis revealing how different factors influence predictions.
   * The findings align with real-world expectations: economic power, affordability, and environmental conditions shape the overall quality of life.

**Final Thought**

This study provides a data-driven perspective on the key factors that contribute to a better quality of life in a country. The findings highlight the importance of climate conditions, housing affordability, and economic stability. These insights can help policymakers prioritize improvements, such as fostering economic opportunities to enhance purchasing power, implementing strategies to reduce pollution, and ensuring that housing remains affordable. By addressing these factors, governments can create a more sustainable and livable environment for their citizens.