

# SMARTINTERNZ EXTERNSHIP APPLIED DATA SCIENCE PROJECT REPORT

## TITLE

**World Happiness Report**

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# **1. INTRODUCTION**

## **1.1. OVERVIEW**

The World Happiness Report is an esteemed annual publication that serves as a beacon of insight into the happiness levels of countries across the globe. Beyond its significance in evaluating societal well-being, this report holds valuable potential for addressing crucial business challenges, including the relationship between happiness and workplace productivity. Recognizing the importance of employee well-being and its influence on job satisfaction, overall performance, and company success, organizations are increasingly turning to the World Happiness Report to inform their policies and initiatives.

## **1.2. PURPOSE**

In this report, we embark on a data science project that harnesses the power of the World Happiness Report to explore the intricate link between happiness and workplace productivity. Our objective is to uncover the factors that contribute to happiness in different countries and draw connections to the realm of the workplace. By undertaking a comprehensive analysis of the economic, social, and environmental indicators within the report, we seek to offer evidence-based insights that can shape organizational strategies aimed at promoting employee happiness and, consequently, enhancing productivity.

## **2. LITERATURE SURVEY**

- “World Happiness Report” by Helliwell, J., Layard, R., & Sachs, J. (eds.) (2019) The World Happiness Report serves as a foundational piece of literature for understanding global happiness levels and the factors that contribute to well-being across countries. This report presents comprehensive data and rankings based on various indicators, providing insights into the determinants of happiness. While the report primarily focuses on societal well-being, it offers valuable insights that can inform workplace policies and initiatives.
- "The Role of Workplace Happiness in Employee Productivity" by Robertson, I., & Cooper, C. (2011) This study explores the relationship between workplace happiness and employee productivity. Although not specifically tied to the World Happiness Report, it highlights the importance of creating a positive work environment to enhance employee well-being and performance. The authors emphasize the need for organizations to prioritize factors such as job satisfaction, work-life balance, and employee engagement to foster happiness and boost productivity.
- "Happiness and Work Performance: An Exploration of the Cross-Domain Relationship" by Di Fabio, A., & Kenny, M. E. (2019) Examining the interplay between happiness and work performance, this research investigates how individual happiness can influence workplace outcomes. While not directly referencing the World Happiness Report, the study acknowledges the significance of broader factors, including societal well-being indicators, in shaping individual happiness. The findings highlight the positive impact of happiness on various work-related outcomes, such as job satisfaction, engagement, and productivity.

- "Linking Happiness to Organizational Productivity: A Review of Current Evidence and Implications" by Youssef-Morgan, C. M., & Noon, A. (2017) This literature review explores the connection between happiness and organizational productivity. Although it does not specifically reference the World Happiness Report, it provides an overview of relevant studies that examine workplace happiness and its impact on employee performance. The authors highlight the need for organizations to adopt strategies that promote happiness among employees to achieve higher levels of productivity.
- "Happiness at Work: A Review of the Empirical Literature" by Lyubomirsky, S., King, L., & Diener, E. (2005) This review article offers insights into the relationship between happiness and work-related outcomes. Although not directly tied to the World Happiness Report, it discusses the importance of happiness in the workplace and its influence on employee attitudes, motivation, and productivity. The authors emphasize the need for organizations to cultivate a positive work environment and implement practices that support employee well-being.

## 2.1. EXISTING PROBLEM

The World Happiness Report presents a pressing issue that demands attention: the persistent happiness gap in developing nations. While some countries experience high levels of happiness and well-being, others continue to face significant challenges in achieving similar outcomes. This discrepancy raises important questions about the underlying causes of the happiness gap and its implications for social and economic development.

The problem at hand is twofold. Firstly, there is a need to understand the factors contributing to the lower happiness levels observed in developing nations. This requires a comprehensive analysis of economic, social, and environmental indicators, as well as an exploration of the unique circumstances and challenges faced by these countries. Identifying the root causes of the happiness gap is crucial in formulating effective strategies to address this issue.

Secondly, it is imperative to recognize the consequences of the happiness gap on the overall well-being and progress of developing nations. Happiness has been

found to be closely linked to various indicators of human development, including health, education, productivity, and social cohesion. Therefore, the persistence of the happiness gap can hinder progress in these areas, perpetuating a cycle of underdevelopment and inequality.

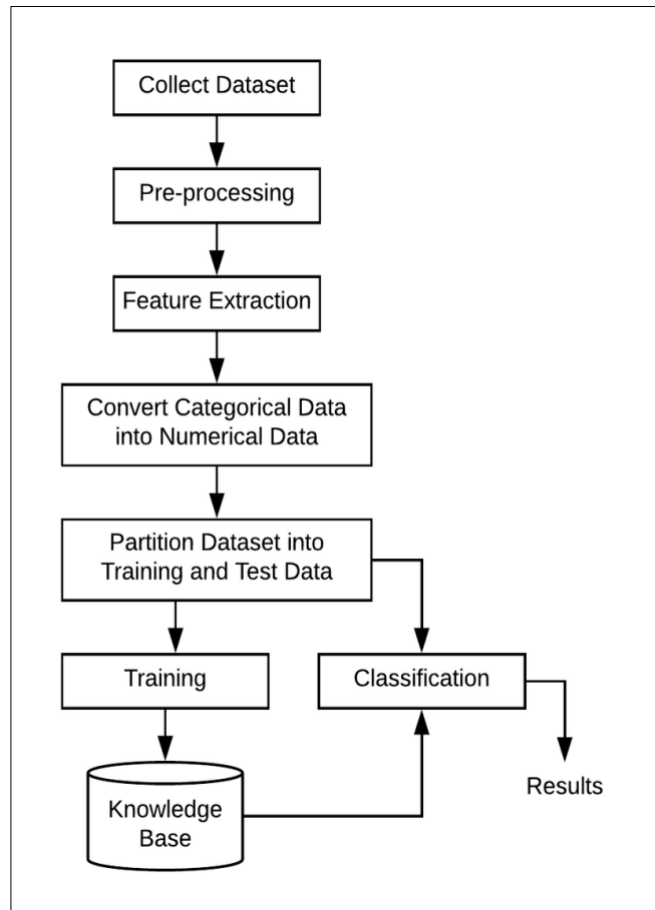
## 2.2. PROPOSED SOLUTION

Our project aims to provide a comprehensive solution that empowers users to predict the happiness score of their country and gain valuable insights into the factors influencing happiness. To achieve this, we have developed a user-friendly website that allows individuals to enter their country's data along with their personal information.

Leveraging advanced data science techniques, we can generate personalized predictions of happiness scores and offer users a deeper understanding of the contributing factors.

## 3. THEORETICAL ANALYSIS

### 3.1. BLOCK DIAGRAM



## 3.2. HARDWARE/SOFTWARE DESIGNING

### HARDWARE DESIGN

- **Computer System:** A normal computer system with sufficient memory and processing capabilities with a browser is required to handle the data preprocessing, model training, and evaluation tasks efficiently. This may include processor, a suitable amount of RAM, and ample storage capacity.
- **Storage:** Sufficient storage capacity is needed to store the dataset, preprocessed data, and trained models. Depending on the size of the dataset, a high-capacity hard disk drive (HDD) or solid-state drive (SSD) may be required.

## SOFTWARE DESIGN

The software components for the machine learning project would involve various tools and frameworks. Here are some essential elements:

- **Programming Language:** Python is used for this machine learning project due to its extensive libraries and frameworks such as NumPy, Pandas, and Scikit-learn.
- **Data Processing and Analysis:** Libraries like Pandas and NumPy are employed for data manipulation, preprocessing, and exploratory data analysis.
- **Machine Learning Frameworks:** Scikit-learn, TensorFlow, and PyTorch are frameworks used for implementing machine learning algorithms, building models, and conducting training and inference.
- **Model Evaluation and Validation:** Techniques like cross-validation and appropriate evaluation metrics are used to assess the performance of the trained models.
- **Visualization:** Libraries like Matplotlib or Seaborn can be utilized for visualizing data distributions, feature importance, and model evaluation results.
- **Deployment:** Once the model is developed, it is integrated into a web application or dashboard using the Flask framework.

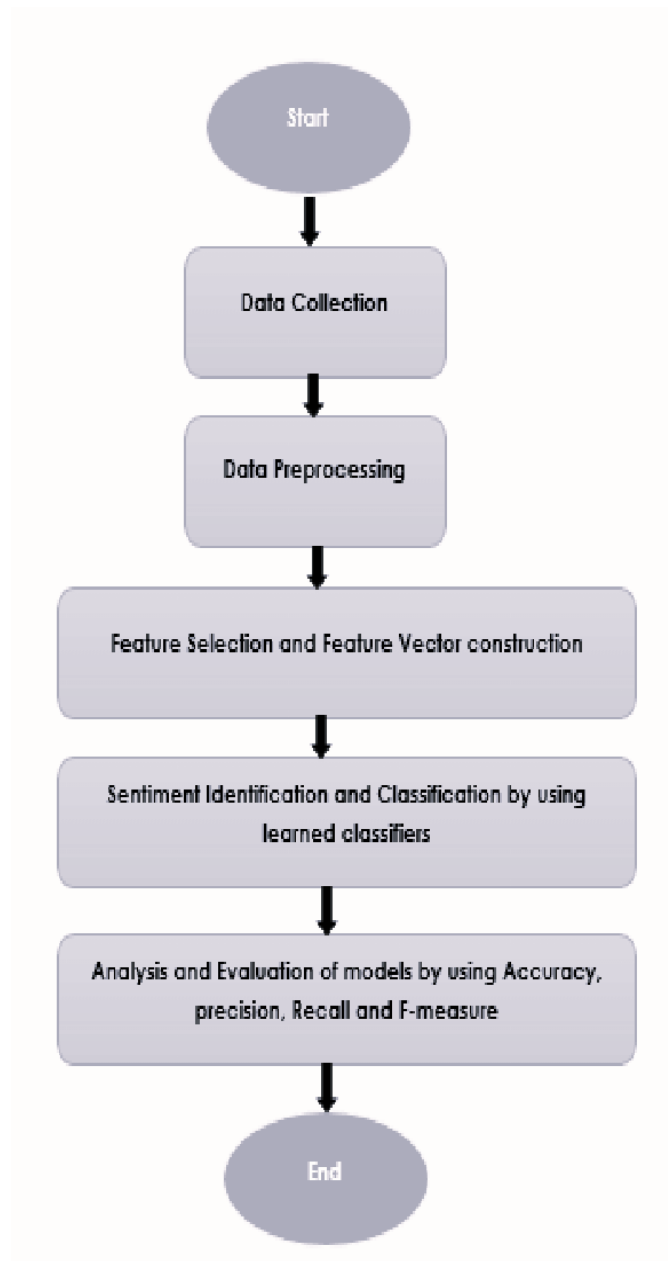
## 4. EXPERIMENTAL INVESTIGATIONS

- **Data Collection:** Gather a comprehensive dataset that includes relevant variables related to happiness from the World Happiness Report and other reputable sources. Ensure the dataset covers a diverse range of countries, demographics, and happiness indicators to capture a representative sample.
- **Data Preprocessing:** Clean the dataset by handling missing values, removing duplicates, and addressing outliers. Perform necessary data transformations, such as normalization or feature scaling, to ensure consistency and comparability across variables.
- **Feature Engineering:** Extract and select meaningful features from the dataset that influence happiness scores. This may include economic indicators, social factors, environmental variables, and cultural dimensions. Consider incorporating additional derived features or aggregating indicators to enhance the predictive power of the model.
- **Model Selection:** Experiment with various machine learning algorithms suitable for regression tasks, such as linear regression, decision trees, random forests, gradient boosting, or neural networks. Explore different algorithms to identify the one that yields the best performance in predicting happiness scores.
- **Training and Evaluation:** Split the dataset into training and testing sets, and train the selected models on the training data. Evaluate the models using appropriate evaluation metrics, such as mean squared error or R-squared, to assess their performance in predicting happiness scores. Perform cross-validation to validate the model's robustness.
- **Hyperparameter Tuning:** Fine-tune the hyperparameters of the chosen models to optimize their performance. Employ techniques like grid search or random search to explore different combinations of hyperparameters and identify the optimal configuration.



- **Comparative Analysis:** Compare the performance of different models and identify the most accurate and reliable one for predicting happiness scores. Analyze the strengths and weaknesses of each model to gain insights into their suitability and interpretability.
- **Testing on Unseen Data:** Evaluate the selected model on unseen data to assess its generalization ability. This step helps ensure that the model can accurately predict happiness scores for new countries or observations outside the training dataset.
- **Interpretation and Insights:** Analyze the trained model to interpret the importance of different features in predicting happiness scores. Extract insights and actionable recommendations for policymakers and organizations to prioritize factors that contribute to happiness and improve overall well-being.
- **Validation and Real-world Application:** Validate the model's performance by applying it to real-world scenarios or deploying it in a controlled environment. Monitor the model's predictions and iterate on improvements if necessary.

## **5. FLOWCHART**




## 6. RESULT

HOME - PAGE:



## PREDICT HAPPINESS - PAGE:

HomePredict HappinessWhat we doCountry RankingsAboutLogin

### World Happiness Predictor

Logged GDP per capita

Social support

Healthy life expectancy

Freedom to make life choices

Generosity


Perceptions of corruption

What makes you happy?

GET THE HAPPINESS SCORE

## WHAT WE DO - PAGE:


## What we do



### DATA COLLECTION

Gather data on various factors such as life expectancy, social support, freedom, and other relevant indicators from different countries.


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### DATA ANALYSIS

Analyze the collected data using statistical methods and machine learning algorithms to identify patterns and correlations.

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### FEATURE SELECTION



Determine which factors or features have the most significant impact on happiness scores and select them for further analysis.

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# COUNTRY RANKINGS - PAGE:

## These Countries are in Top Four Ranks



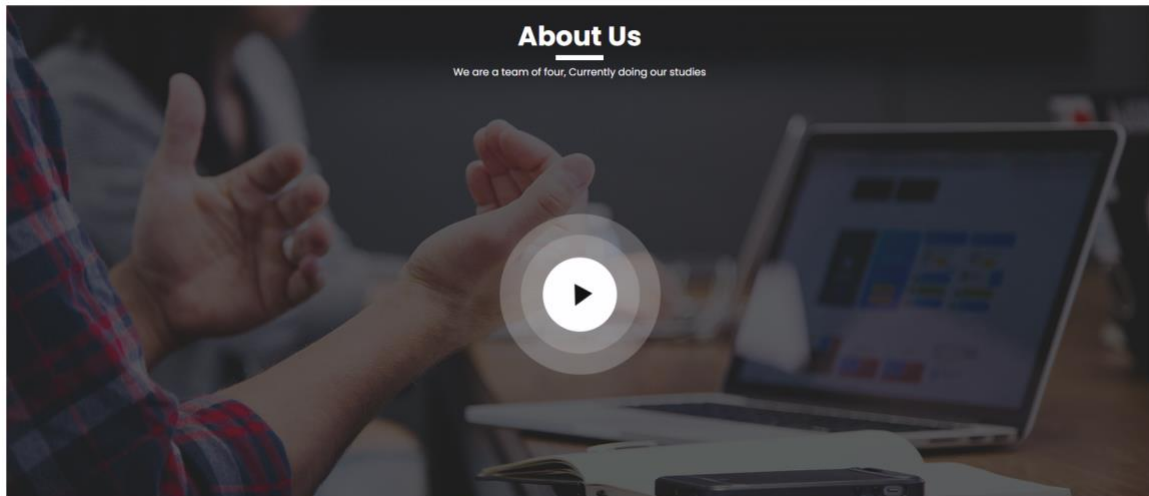
### Finland

Finland consistently ranks among the happiest countries in the world. It is known for its high-quality education system, well-functioning social support networks, and strong emphasis on work-life balance.

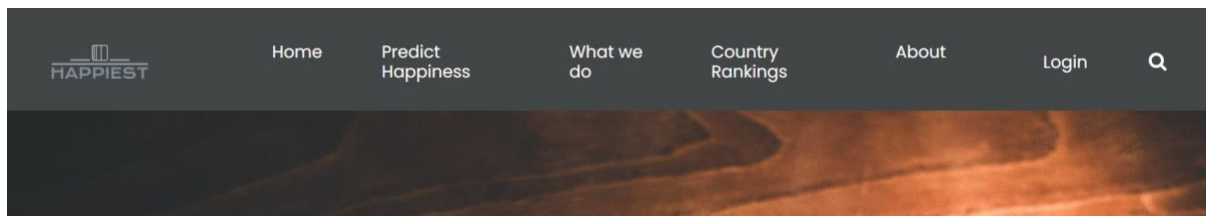


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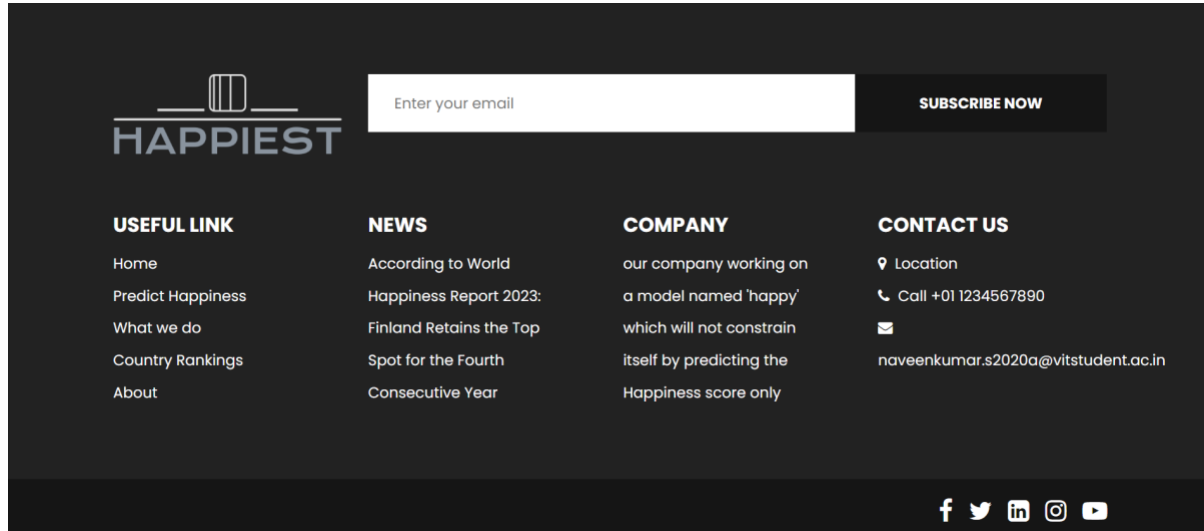
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## 7. ADVANTAGES AND DISADVANTAGES

### ADVANTAGES

- **Holistic Understanding of Happiness:** The solution based on the World Happiness Report provides businesses with a comprehensive analysis of factors contributing to happiness at the country level. This knowledge allows organizations to develop a holistic understanding of happiness and tailor their policies and initiatives accordingly.
- **Data-Driven Decision Making:** By leveraging insights derived from the predictive model, businesses can make data-driven decisions regarding strategies and interventions that impact employee happiness. This enables organizations to allocate resources effectively, prioritize initiatives, and create a happier and more productive work environment.

- **Improved Employee Engagement and Productivity:** Prioritizing employee happiness has a direct correlation with higher levels of engagement and productivity. By understanding the factors that contribute to happiness, businesses can implement initiatives that enhance employee well-being, job satisfaction, and overall performance.
- **Enhanced Company Performance:** A happier workforce has a positive impact on overall company performance. When employees are satisfied and engaged, they are more likely to be motivated, innovative, and committed to achieving organizational goals.
- **Competitive Advantage:** By focusing on employee happiness and well-being, businesses can gain a competitive edge in attracting and retaining top talent. A positive work culture that values and prioritizes employee happiness can be a significant differentiating factor for potential employees when considering job opportunities.

## DISADVANTAGES

- **Subjectivity and Complexity:** Happiness is a subjective and multifaceted concept, making it challenging to capture and quantify accurately. The World Happiness Report uses various indicators and subjective measures, which may introduce complexities and uncertainties in predicting happiness scores.
- **Limited Data Availability:** The availability of comprehensive and up-to-date data on all countries and happiness factors may be limited. The World Happiness Report provides data for a set of countries, but some regions or specific factors may have limited data coverage, which could affect the accuracy and reliability of the predictive model.

- **Cultural and Contextual Variations:** Happiness factors can vary across cultures, societies, and contexts. Implementing a predictive model based on a global report may overlook specific cultural nuances and context-specific determinants of happiness. It is essential to consider the cultural and regional differences to ensure the model's applicability and accuracy.
- **Ethical Considerations:** Collecting and analyzing personal data, including individual well-being, may raise ethical concerns. It is crucial to handle sensitive information with utmost care, ensuring data privacy, and adhering to ethical guidelines and regulations.
- **Continuous Model Adaptation:** Happiness factors and societal dynamics can change over time. To maintain the relevance and accuracy of the predictive model, regular updates and adaptations may be required to capture emerging trends, changing circumstances, and new factors influencing happiness.

## **8. APPLICATIONS**

- **Policy Recommendations:** The project's insights can assist governments and organizations in identifying specific areas that require attention to improve happiness levels. By understanding the factors that contribute to happiness in the World Happiness Report, policymakers can develop targeted policies and initiatives that address social, economic, and environmental aspects, promoting overall well-being and quality of life.
- **Social and Environmental Impact:** The project's findings can highlight the importance of social and environmental factors in influencing happiness. This can drive attention and action towards areas such as social inclusion, education, healthcare, environmental sustainability, and access to basic services, fostering greater happiness and well-being within societies.



- **Economic Development Strategies:** The project's insights can inform economic development strategies that prioritize the well-being of individuals and communities. By considering the factors that contribute to happiness, governments and organizations can design policies and initiatives that promote equitable economic growth, job creation, income equality, and access to opportunities, ultimately enhancing happiness levels.
- **Community Engagement and Empowerment:** The project's findings can facilitate community engagement and empowerment initiatives. By understanding the factors that contribute to happiness at the community level, organizations can collaborate with local communities to design and implement programs that address specific needs, promote social cohesion, and enhance community well-being.
- **Education and Mental Health Initiatives:** The project's insights can guide the development of education and mental health initiatives. By understanding the factors that contribute to happiness, policymakers and organizations can prioritize investments in education systems, mental health services, and social support networks, promoting positive mental well-being and overall happiness.
- **Sustainable Development Goals Alignment:** The project's findings can contribute to the alignment of initiatives and efforts with the United Nations' Sustainable Development Goals (SDGs). By identifying the factors that drive happiness, organizations can align their strategies and actions with specific SDGs, such as poverty eradication, gender equality, good health and well-being, quality education, sustainable cities and communities, and climate action.
- By considering these insights derived from the World Happiness Report, organizations, policymakers, and governments can develop targeted strategies and initiatives that improve specific areas related to happiness, leading to enhanced well-being and a happier world.

## **9. CONCLUSION**

In conclusion, the World Happiness Report project provides valuable insights into the factors influencing happiness at a global and country level. By leveraging the comprehensive analysis and rankings provided in the report, the project aims to predict happiness scores based on user inputs, empowering individuals to understand and explore the happiness levels of their respective countries.

Through the development of a user-friendly website and the integration of data from the World Happiness Report, the project offers users the opportunity to input their country's data and personal information, resulting in a predicted happiness score. This allows individuals to gain a deeper understanding of the factors that contribute to happiness and provides a platform for exploring potential areas for improvement.

## **10. FUTURE SCOPE**

Longitudinal Analysis: Conducting longitudinal analysis by collecting happiness data over multiple years can provide insights into the trends and changes in happiness levels over time. This can help identify patterns, understand the impact of policy interventions, and track the progress of countries in improving happiness.'Cross-Cultural Analysis: Expanding the project to include a cross-cultural analysis can provide a comparative understanding of happiness across different regions and cultures. This can shed light on the cultural factors influencing happiness and identify strategies that can be tailored to specific cultural contexts.'Fine-grained Analysis: Incorporating more granular data, such as sub-national or city-level data, can allow for a more localized analysis of happiness. This can help identify variations in happiness within countries and facilitate targeted interventions at regional levels.

Sentiment Analysis: Integrating sentiment analysis techniques can provide a deeper understanding of the emotional aspects of happiness. Analyzing social media data, surveys, or user-generated content can capture real-time sentiment and enrich the predictive models, offering a more dynamic and nuanced assessment of happiness.

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## **APPENDIX**

### **A. SOURCE CODE**

GitHub-gitfront link:

<https://gitfront.io/r/user-5847750/N6PVRRfN15jY/happinesspredictor-repo/>