

A PROJECT REPORT
on
“AI Mental Health Fitness Tracker”

Submitted to
KIIT Deemed to be University

In Partial Fulfilment of the Requirement for the Award of
BACHELOR’S DEGREE IN
INFORMATION TECHNOLOGY

BY

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UNDER THE GUIDANCE OF
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CERTIFICATE

This is certify that the project entitled

“AI Mental Health Fitness Tracker”

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is a record of bonafide work carried out by them, in the partial fulfilment of the requirement for the award of Degree of Bachelor of Engineering (Information Technology) at KIIT Deemed to be university, Bhubaneswar. This work is done during year 2023-2024, under our guidance.

Date: 14/11/2023

(Dr. Rajdeep Chatterjee)
Project Guide

Acknowledgements

"I would like to express my sincere gratitude to Dr. Rajdeep Chatterjee for his invaluable guidance and support throughout my project. His extensive knowledge, insightful feedback, and continuous encouragement have been instrumental in the successful completion of this project. I am grateful for his dedication and patience in answering all my queries and providing me with valuable inputs that helped me to improve my work. Thank you, Dr. Chatterjee, for being an excellent mentor and for sharing your expertise with me. Your guidance has been a source of inspiration to me, and I look forward to applying the knowledge gained from this project in my future endeavors."

Mayank Kumar Singh
Nishant Naman
Sachin Singh
Ankit Prince

ABSTRACT

In today's date data analysis is need for every data analytics to examine the sets of data to extract the useful information from it and to draw conclusion according to the information.

Data analytics techniques and algorithms are more used by the commercial industries which enables them to take precise business decisions. It is also used by the analysts and the experts to authenticate or negate experimental layouts, assumptions and conclusions. In recent years the analytics is being used in the field of health and fitness to predict and draw various insights.

The Mental Health Fitness Tracker Project aims to develop an AI-Driven solution for analyzing and predicting mental fitness levels of individuals with various mental disorder.

Keywords: Regression Algorithms, Numpy, Pandas, Seaborn, Matplotlib

Contents

1	Introduction	1-2
2	Basic Concepts/ Literature Review	3
2	2 ML, Python, Pandas, Numpy, Scikit-Learn	4
3	Problem Statement / Requirement Specifications/Approach	5
3.1	Data Collecetion	5
3.2	Data Preprocessing	5
3.3	Data Visualization	6
3.4	Model Development	6
	3.4.1 Block Diagram and Plot	6
4	Implementation	7
4.1	Data collection, Preprocession	7
4.2	Feature Engineering	7
4.3	Model Training	7
4.4	Testing / Verification Plan	7
5	Standard Adopted	8
5.1	Design Standards	8
5.2	Coding Standards	8
5.3	Testing Standards	8
6	Conclusion and Future Scope	9
6.1	Conclusion	9
6.2	Future Scope	10
	References	11
	Individual Contribution	12
	Plagiarism Report	13

Chapter 1

Introduction :

Machine Learning is a branch of Artificial Intelligence that aims at solving real-life engineering problems. This technique requires no programming, whereas it depends on only data learning where the machine learns from pre-existing data and predicts the result accordingly. Machine Learning methods have benefit of using decision trees, heuristic learning, knowledge acquisition, and mathematical models. It thus provides controllability, observability, stability and effectiveness.

In an era characterized by the increasing intersection of technology and well-being, the development of innovative solutions to support mental health has become a paramount endeavor. Recognizing the significance of mental well-being in our daily lives, the Mental Health Fitness Tracker, powered by machine learning, emerges as a pioneering project aimed at empowering individuals to proactively manage and understand their mental health.

Mental health, often overlooked or stigmatized, is an integral component of overall wellness. In response to this, the Mental Health Fitness Tracker harnesses the capabilities of machine learning to create a personalized and dynamic platform. By leveraging advanced algorithms, this project seeks to provide users with actionable insights into their mental health, fostering a deeper understanding of patterns, triggers, and personalized coping mechanisms.

This introduction sets the stage for a comprehensive exploration of the Mental Health Fitness Tracker, delving into its key features, ethical considerations, and the broader implications of integrating technology into mental health care. As we navigate the intricacies of this innovative project, it becomes clear that its potential impact extends beyond individual users, contributing to the evolving landscape of mental health technology and cultivating a more informed and supportive approach to mental well-being.

Chapter 2

Basic Concepts/ Literature Review

The AI Mental Health Fitness Tracker project is based on the application of machine learning algorithms to predict the Mental Health Of the Individuals. The project is unique in that it uses a comprehensive set of features to predict the Mental Health Of the Individuals

Tools used in this project are -

Machine learning
Python
Pandas
NumPy

2.1 MACHINE LEARNING

Machine learning (ML) is a field devoted to understanding and building methods that let machines "learn" – that is, methods that leverage data to improve computer performance on some set of tasks.

Machine learning algorithms build a model based on sample data, known as training data, in order to make predictions or decisions without being explicitly programmed to do so.

Machine learning algorithms are used in a wide variety of applications, such as in medicine, email filtering, speech recognition, agriculture, and computer vision, where it is difficult or unfeasible to develop conventional algorithms to perform the needed tasks.

2.2 PYTHON

Python is a high-level, general-purpose programming language. Its design philosophy emphasizes code readability with the use of significant indentation via the off-side rule.

2.3 PANDAS

Pandas is a Python package that provides fast, flexible, and expressive data structures designed to make working with "relational" or "labeled" data both easy and intuitive. It aims to be the fundamental high-level building block for doing practical, real world data analysis in Python.

2.4 NUMPY

NumPy is a library for the Python programming language, adding support for large, multi-dimensional arrays and matrices, along with a large collection of high-level mathematical functions to operate on these arrays.

Chapter 3

Problem Statement / Requirement Specifications / Approach

To predict the results of Mental Health Fitness using machine learning techniques or algorithms such as Regression Algorithms.

Approach steps are as follows -

3.1 Data Collection

Data collection is the process of gathering and measuring information from countless different sources. In order to use the data, we collect to develop practical machine learning solutions.

Collecting data allows you to capture a record of past events so that we can use data analysis to find recurring patterns. From those patterns, you build predictive models using machine learning algorithms that look for trends and predict future changes.

3.2 Data Preprocessing

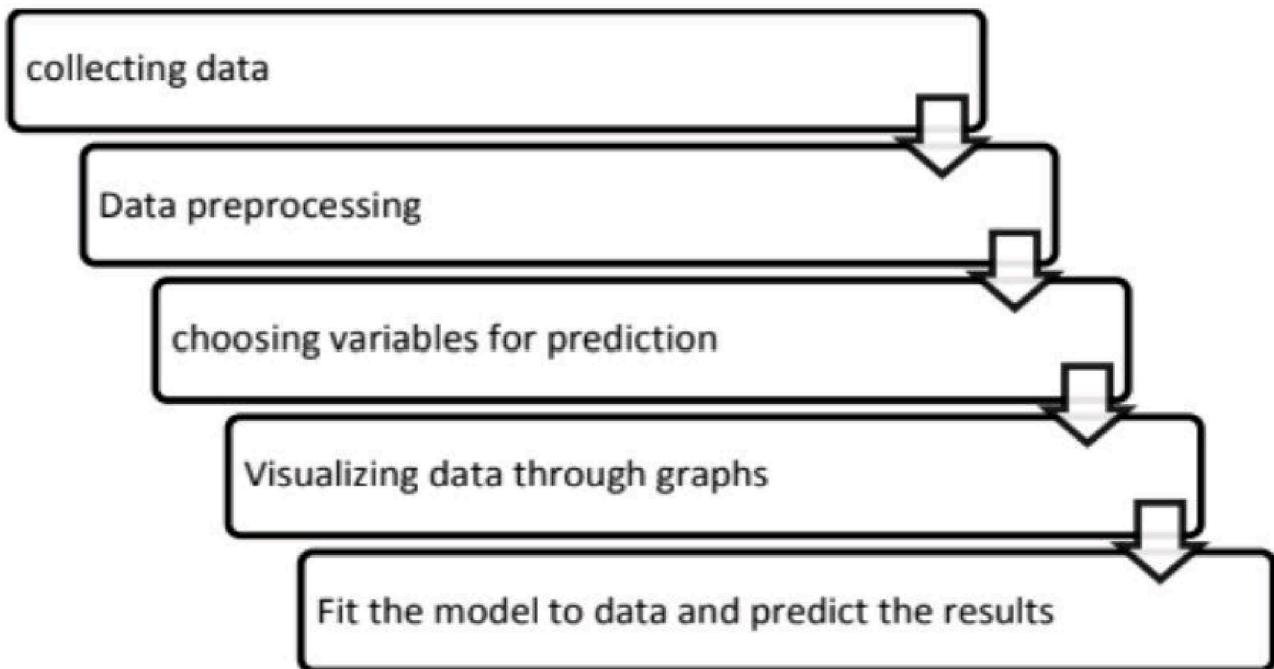
There are some null values in the dataset in the columns such as winner, city, venue etc. Due to the presence of these null values, the classification cannot be done accurately. So, we tried to replace the null values in different columns with dummy values.

3.3 Data Visualization

The data which has been collected is used for visualizing for the better understanding of the information.

3.4 Model Development and Evaluation

Here, we have developed a generic model and applied all classification methods. The data is split into training data and test data, we train the model using certain features and use it to predict the testing data, then we calculate the performance of the system.



Process adopted for Prediction of Mental Health Fitness

Year	1	0.047	0.014	0.08	0.043	0.053	-0.035	-0.0068
Schizophrenia	0.047	1	0.2	0.57	0.4	0.65	-0.36	0.33
Bipolar_disorder	0.014	0.2	1	0.71	0.62	0.42	0.21	0.36
Eating_disorder	0.08	0.57	0.71	1	0.65	0.68	0.054	0.38
Anxiety	0.043	0.4	0.62	0.65	1	0.45	0.16	0.17
drug_usage	0.053	0.65	0.42	0.68	0.45	1	-0.061	0.49
depression	-0.035	-0.36	0.21	0.054	0.16	-0.061	1	-0.0077
alcohol	-0.0068	0.33	0.36	0.38	0.17	0.49	-0.0077	1
mental_fitness	0.2	0.63	0.62	0.73	0.64	0.47	-0.043	0.19

Data Visualisation of Menatal Health

Chapter 4

Implementation

The implementation of the AI Mental Fitness Tracker project involves several steps, including data collection, data preprocessing, feature engineering, model training, and evaluation.

1. Data Collection:

The project used a dataset containing Country data from 1990 to 2019, including DALYs (Disability-Adjusted Life Years) , Mental disorders , Sex: Both , Age: All Ages (Percent).The data was obtained from various sources, including GFG (Geeks for Geeks) ,and other online sources.

2. Data Cleaning:

The data was cleaned and preprocessed to ensure data quality and consistency. This involved handling missing values, converting categorical variables into numerical values, and scaling the data to ensure that all features have equal importance.

3. Feature Engineering:

The project used several feature engineering techniques to extract meaningful information from the data. These included feature selection, feature scaling, and feature transformation.

4. Model Training:

The project used several machine learning models, including Logistic Regression, to predict the mental health fitness. The models were trained using a portion of the data and validated using the remaining data to ensure that they generalize well.

Chapter 5

Standards Adopted

5.1 Design Standards

In all the engineering streams, there are predefined design standards are present such as IEEE, ISO etc.

5.2 Coding Standards

Coding standards are collections of coding rules, guidelines, and best practices.

Few of the coding standards are:

1. Write as few lines as possible.
2. Use appropriate naming conventions.
3. Segment blocks of code in the same section into paragraphs.
4. Use indentation to marks the beginning and end of control structures. Clearly specify the code between them.
5. Don't use lengthy functions. Ideally, a single function should carry out a single task.

5.3 Testing Standards

There are some ISO and IEEE standards for quality assurance and testing of the product.

Chapter 6

Conclusion and Future Scope

6.1 Conclusion :

The Mental Health Fitness Tracker using machine learning presents a promising and innovative approach to supporting individuals in their mental well-being journey. Through the integration of advanced algorithms, data analysis, and user engagement, this project strives to contribute positively to the field of mental health.

The utilization of machine learning models enables personalized insights and recommendations, allowing users to better understand their mental health patterns and potential triggers. The continuous monitoring and analysis of various data points, such as mood, sleep patterns, and activity levels, empower individuals to make informed decisions about their mental well-being.

6.2 Future Scope:

The Mental Health Fitness Tracker can evolve through user feedback, continuous improvement of machine learning models, and integration with emerging technologies. Collaboration with mental health professionals and researchers can further enhance the project's efficacy and contribute valuable insights to the broader mental health community.

Ultimately, this project represents a step towards a holistic and technology-driven approach to mental well-being, emphasizing the importance of proactive self-care and destigmatizing conversations around mental health. As the field of mental health technology continues to advance, projects like the Mental Health Fitness Tracker hold the potential to make a meaningful impact on individuals' lives and contribute to a more comprehensive understanding of mental health.

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INDIVIDUAL CONTRIBUTION REPORT:

AI Mental Health Fitness Tracker

Mayank Kumar Singh - 2006320

The AI Mental Health Fitness Tracker project is a machine learning-based project that aims to predict the Mental health fitness . As an individual contributor to this project, my primary role was to perform data collection, data preprocessing and data visualizing.

Specifically, I was responsible for handling missing values, dealing with outliers, and converting categorical variables into numerical ones. Overall, my contribution to the project helped to build a robust machine learning model that accurately predicts the Mental Health Of the Individuals.

Nishant Naman - 2006323

As an individual contributor to this project, my primary role was to perform feature engineering tasks.

And I Helped My group Member in making of the project report. Overall, my contribution to the project helped to build a robust machine learning model that accurately predicts the outcome Mental Health Of the Individuals.

Sachin Singh - 2006333

As an individual contributor to this project, my primary role was to perform Mathematical Calculations of the data.

And I made The ppt of the project with the reference of project report. My contribution is also their in Correcting Historical data with Current data . Overall, my contribution to the project helped to build a robust machine learning model that accurately predicts the outcome of Mental Health Of the Individuals.

Ankit Prince - 2006337

As an individual contributor to this project, my primary role was to deal with visualization part of the project using Matplotlib which creates plots and Visualization . And I Maded the report of the project with the help of one of my group member. My contribution to the project helped to build a robust machine learning model that accurately predicts the outcome of Mental Health Of the Individuals.

Mental Fitness Tracker using AI

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