International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 07 Issue: 04 | April - 2023 Impact Factor: 8.176 ISSN: 2582-3930

MENTAL DISORDER PREDICTION USING MACHINE LEARNING

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ABSTRACT

The modern lifestyle has increased stress and pressure, and people are facing psychological problems and anomalies. However, the usefulness of these abnormalities in distinguishing individual patients with bipolar disorder from mood disorders or healthy controls and stratifying patients by overall disease and burden has not been evaluated in large cohorts. Is not ... This study uses a machine learning approach to study bipolar disorder using the Mood Disorder Questionnaire (MDQ). A dataset is fed to a decision tree classifier, which determines the most important features in the dataset and makes them the decision factors for that level in the decision tree. Test samples are compared to each level of determinant, and this determination classifies each test case into a defined class (screened positive or screened negative). The Mood Disorder Questionnaire is a viable method for detecting bipolar disorder.

INTRODUCTION

Mental health is the sum total of a person's emotional, social and psychological well-being. It affects a person's ability to think, act, and feel. Mental health is a measure of stress management and decision making at all stages of life. Mental health is a very important factor in all stages of life, whether in childhood or adulthood.Most of the time, mental health is not discussed publicly and lacks proper recognition in society. . People generally don't talk about it publicly. Mental health can affect how we think and act. Common reasons for mental health instability include: Past life experiences, etc. B. Rioting or bullying, biological factors such as genes, genetic problems from the family

Mental health issues become very common once people accept them and are better able to cope with them.If you have symptoms such as:, too little or too much sleep, get away from your usual routines and people, exponential increase in drug use,Severe mood swings,have thoughts of hurting yourself.

Positive mental health helps people reach their full potential. It can also help you deal with stress at home and at work. It makes people more productive. To maintain this positive mental health, a person must seek help from others, connect with others, help others, have a regular routine, and develop coping skills.

RELATED WORKS

"MENTAL DISORDER PREDICTION USING MACHINE LEARNING" is the project developed to explain about various machine learning model to predict the mental disorder. These are the some of research papers that suits.

a.Intelligent data mining and machine learning for mental health diagnosis using genetic algorithm

Azar, Ghassan & Gloster, Clay & El-Bathy, Naser & Yu, Su & Neela, Rajasree & Alothman, Israa. (2015). Intelligent data mining and machine learning for mental health diagnosis using genetic algorithm. 201-206. 10.1109/EIT.2015.7293425

b.Framework for Classifying Online Mental Health-Related Communities With an Interest in Depression

B. Saha, T. Nguyen, D. Phung and S. Venkatesh, "A Framework for Classifying Online Mental Health-Related Communities With an Interest in Depression," in IEEE Journal of Biomedical and Health Informatics, vol. 20, no. 4, pp. 1008-1015, July 2016.

c.Detecting Cognitive Distortions Through Machine Learning Text Analytics

T.Simms, C. Ramstedt, M. Rich, M. Richards, T. Martinez and C. Giraud-Carrier, "Detecting Cognitive Distortions Through Machine Learning Text Analytic," 2017 IEEE International Conference on Healthcare Informatics (ICHI), Park City, UT, 2017, pp. 508-512..

d.Machine Learning Framework for the Detection of Mental Stress at Multiple Levels:

Subhani, Ahmad & Mumtaz, Wajid & MOHAMAD SAAD, MOHAMAD NAUFAL & Kamel, Nidal & Malik, Aamir. (2017). Machine Learning Framework for the Detection of Mental Stress at Multiple Levels. IEEE Access. PP. 1-1. 10.1109/ACCESS.2017.2723622.

PROBLEM FORMULATION

After high birthrate in India, the percentage of doctors to patients is 1: 1800 and amount occasion give by a doctor for patient is inferior two proceedings. Depression is the leading cause of restriction general. Almost 75% of crowd with insane disorders wait not cooked in underdeveloped countries with nearly 1 heap population taking their lives occurring. In addition, in accordance with the World Health Organization (WHO), 1 in 13 everywhere endures from anxiety. The WHO reports that worry disorders are ultimate average insane disorders worldwide accompanying distinguishing fear, major depressing disorder and friendly fear being ultimate common tension disorders..

METHODOLOGY

The projected work is achieved in Python 3.6.4 accompanying athenaeums scikit-determine, pandas, matplotlib and other necessary athenaeums. We downloaded dataset from kaggle.com. The dossier downloaded holds is split into train set and test set. Machine learning invention is used to a degree SVM, resolution seedling and random woodland

SVM ALGORITHM:

Support Vector Machine SVM is a set of accompanying directed education design secondhand in healing disease for categorization and reversion. SVM simultaneously underrate the practical categorization wrong and be dramatic the lines border. SVM is named Maximum Margin Classifiers and it maybe efficiently act non-uninterrupted categorization utilizing seed trick. An SVM model is a likeness of the instances as points go ahead of, plan so that the instances of the separate classifications are detached by a abundant border breach namely as expansive as likely. Given marked training dossier as dossier points of the form. The SVM classifier first maps the recommendation headings into a resolution advantage, and therefore acts the categorization using an appropriate opening worth.

Random Forest Model

1. Given skilled are n cases in the preparation dataset. From these n cases, substitute-samples are preferred purpose accompanying substitute. These random substitute-samples preferred from the preparation dataset are used to build individual shrubs.

2. Assuming skilled are k variables for recommendation, any m is preferred specific that m < k. m variables are selected carelessly lacking k variables at each bud. The split that is high-quality of these m variables is preferred to split the bud. The worth of m is preserved unaltered while the forest is mature.

3. Each forest is mature as big as likely outside trimming.

4. The class of the new object is called located upon the majority of votes taken from the merger of all the resolution forests.

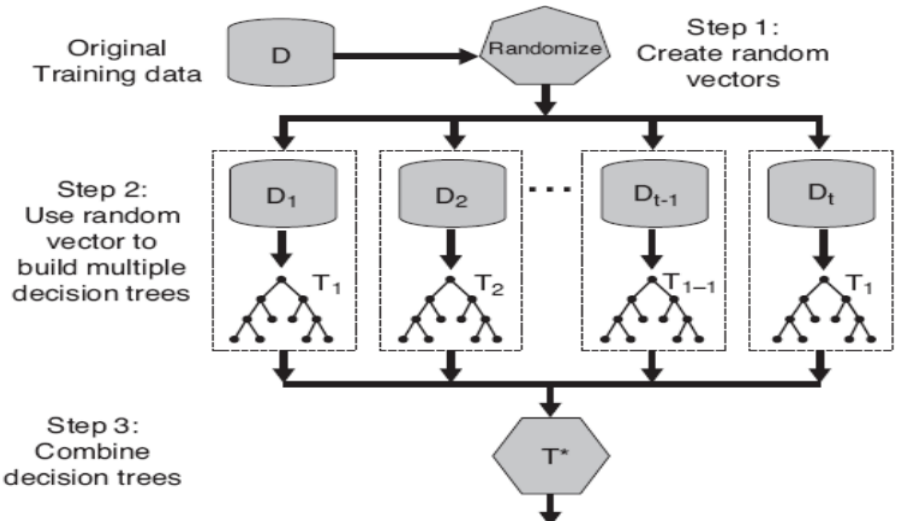


Figure 1.1 Flow chart of Random Forest

Decision Trees Decision

Trees (DTs) are a non-parametric directed knowledge design secondhand for categorization and regression. The aim search out forge a model that forecasts the profit of a aim changeable by education natural resolution rules inferred from the dossier appearance. In decision seedling, leaves show class labels, within knots show facial characteristics and the arms represent the profit of the feature in the within knots. Sci kit-learn bundle specifies a Decision Tree Classifier that is the exercise for a conclusion tree. Decision Tree everything in following style, Place highest in rank attribute of the data set at the root of the shrub. Split the preparation set into subsets. Subsets endure ought as though each subdivision contains dossier accompanying the unchanging profit for an attribute. Repeat step 1 and step 2 on each subdivision just before you find leaf knots as a whole the arms of the seedling. In decision trees, for anticipating a class label for a record we start from the root of the seedling. Then equate the principles of the root attribute accompanying record's attribute. On the base of contrasting, attend the arm corresponding to that advantage and jump to the next bud.

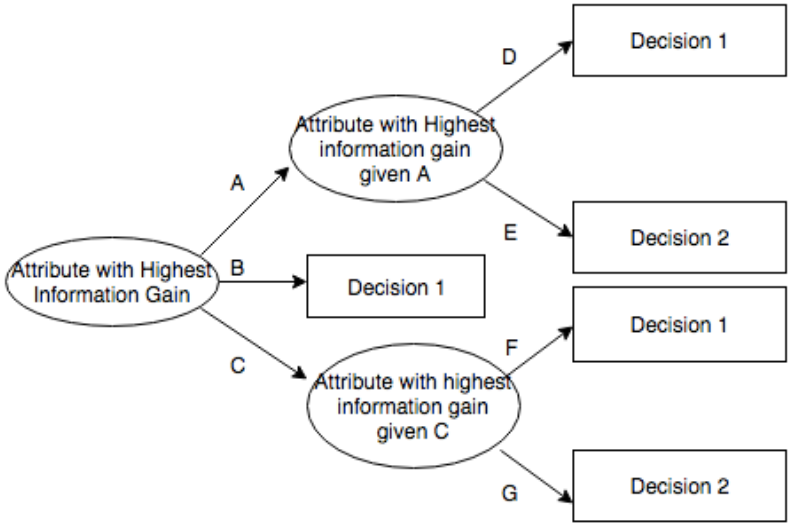


Figure 1.2: Flow chart Decision Tree algorithm

RESULT AND DISCUSSION

Through anaconda prompt, opening GUI interface which has the operation of per-processing and various machine learning techniques like Decision tree, Random forest and SVM were used. By feeding data set into the GUI it will be accessed.

The following screen shows the application Home page

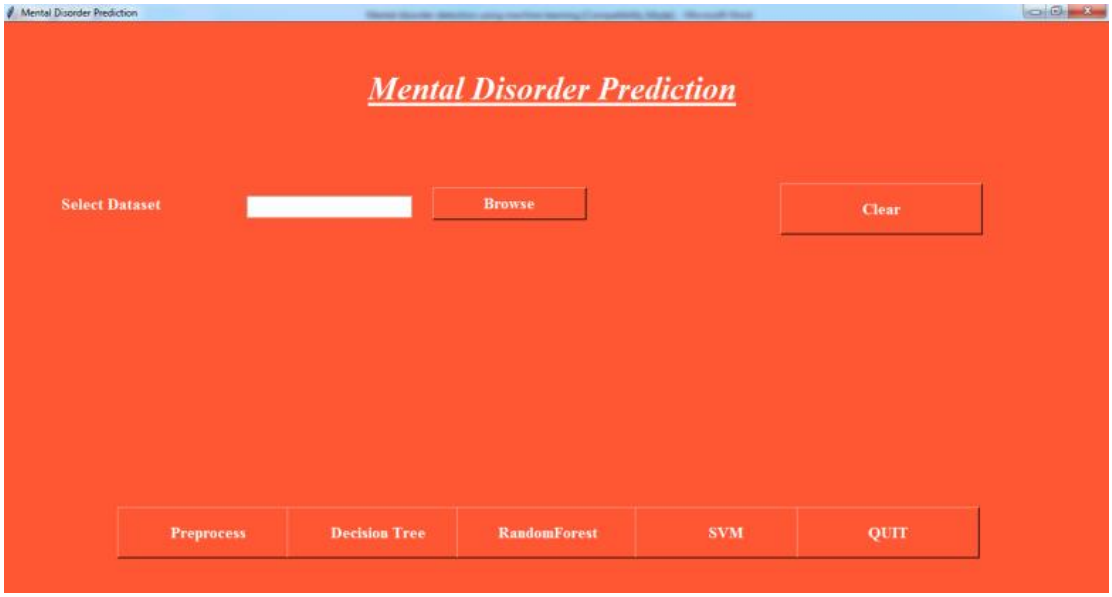
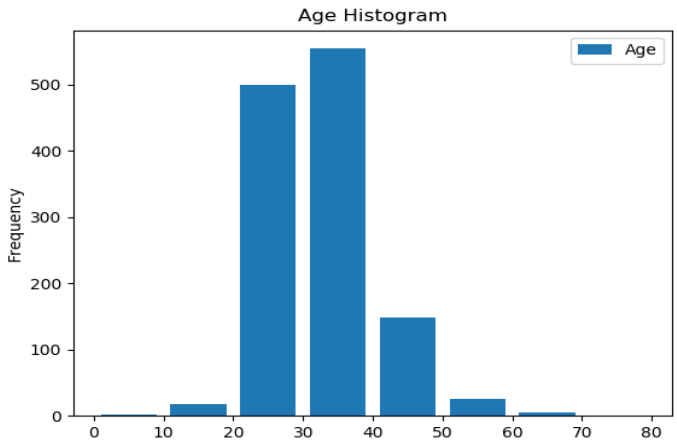
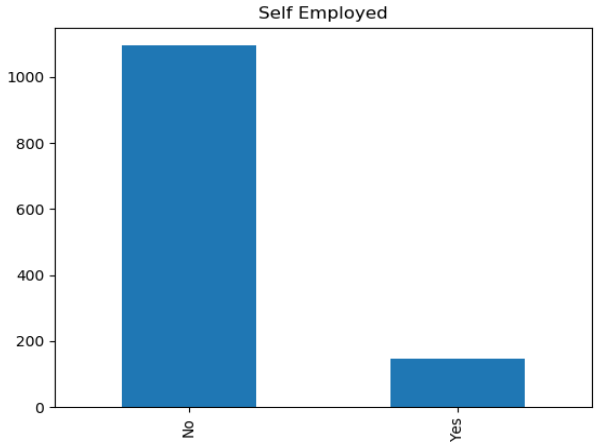


Figure 1.3

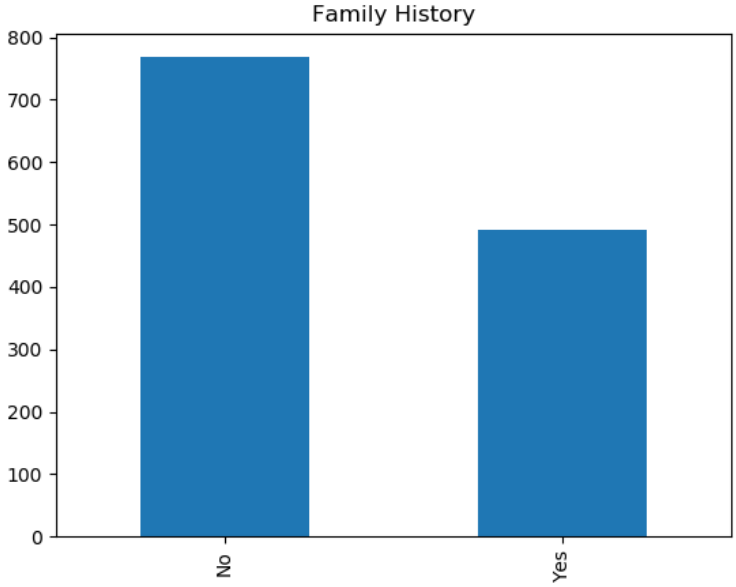
The following screen shows the Visualization through Age



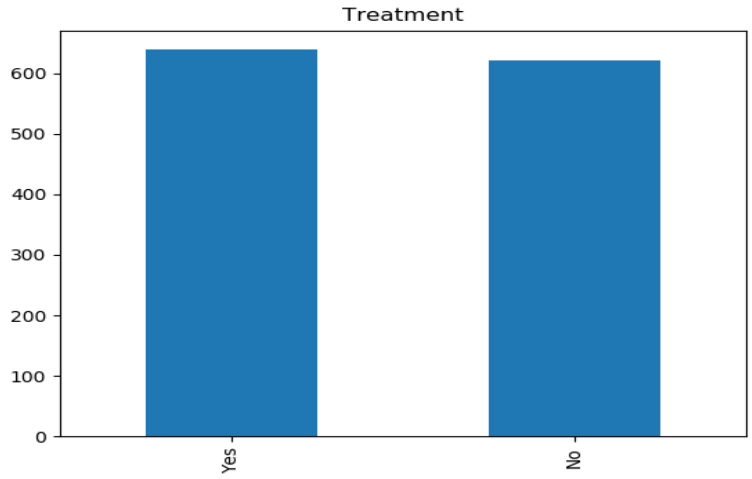
The following screen shows the Visualization through Employment type



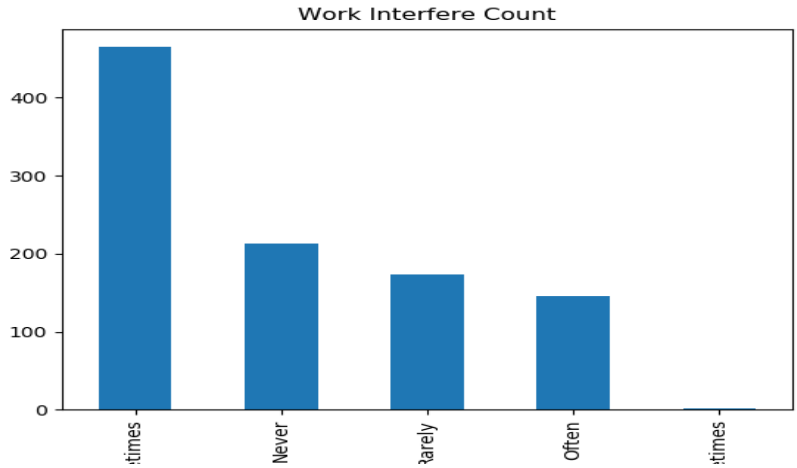
The following screen shows the Visualization through Family history



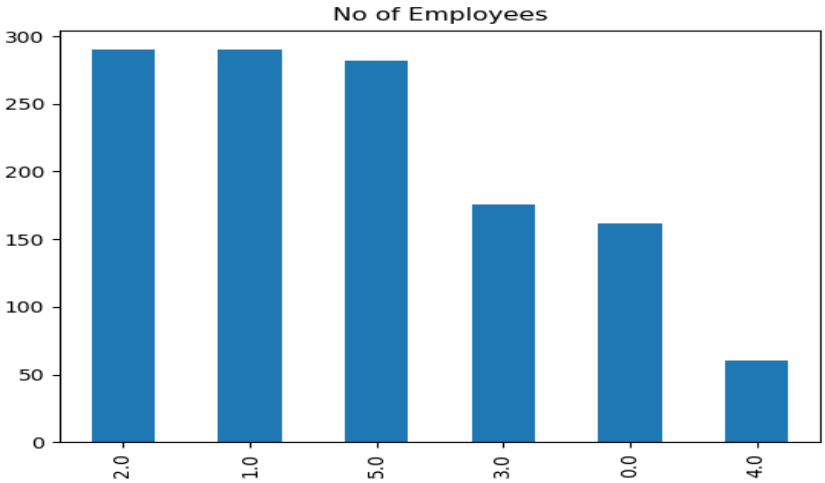
The following screen shows the Visualization through Treatment



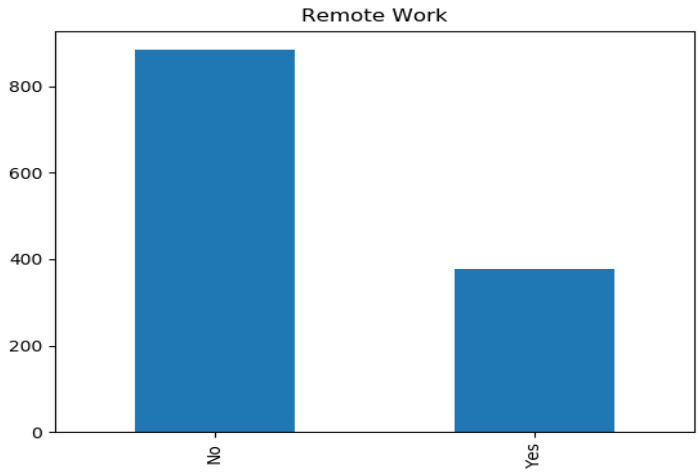
The following screen shows the Visualization of work interfere count



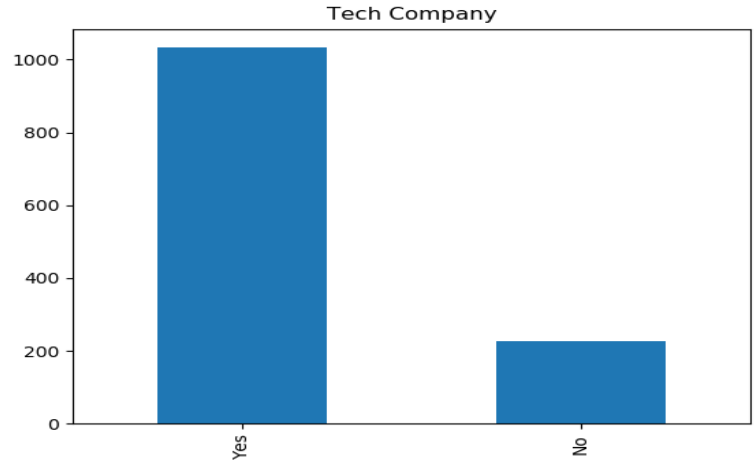
The following screen shows the Visualization of number of employees



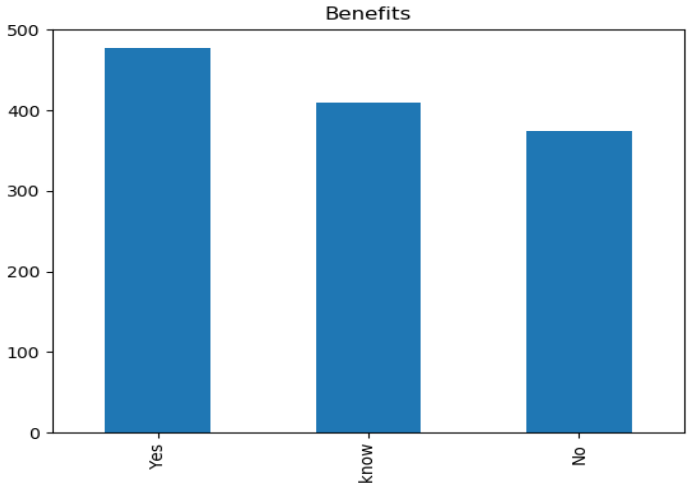
The following screen shows the Visualization of number of remote work employees



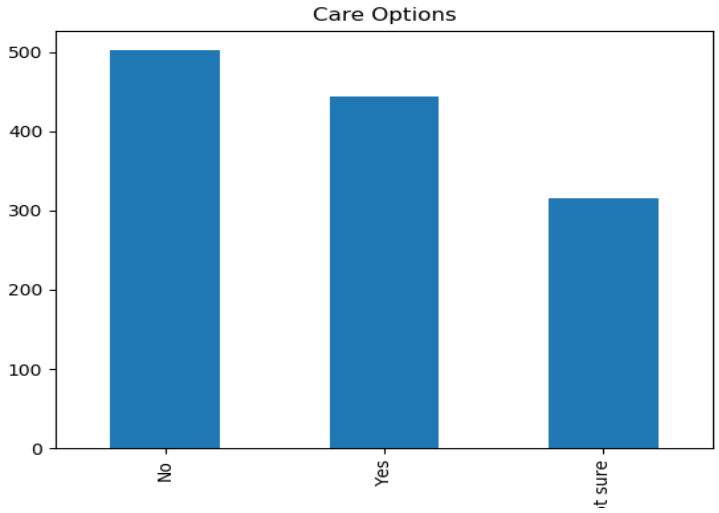
The following screen shows the Visualization of Tech companies



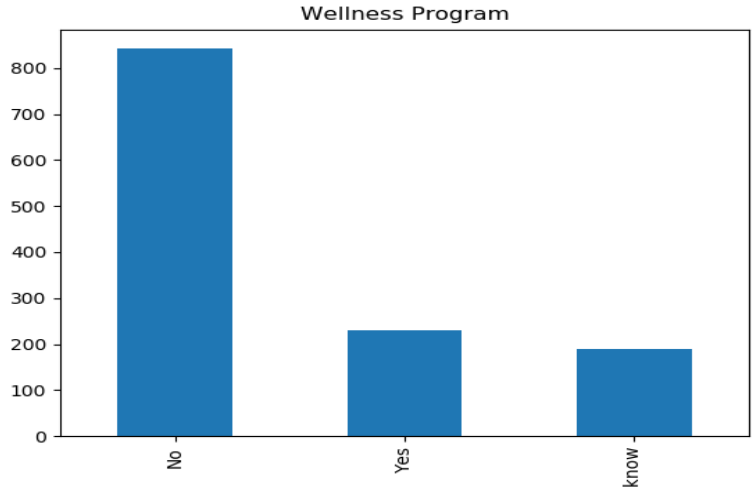
The following screen shows the Visualization of benefits from company



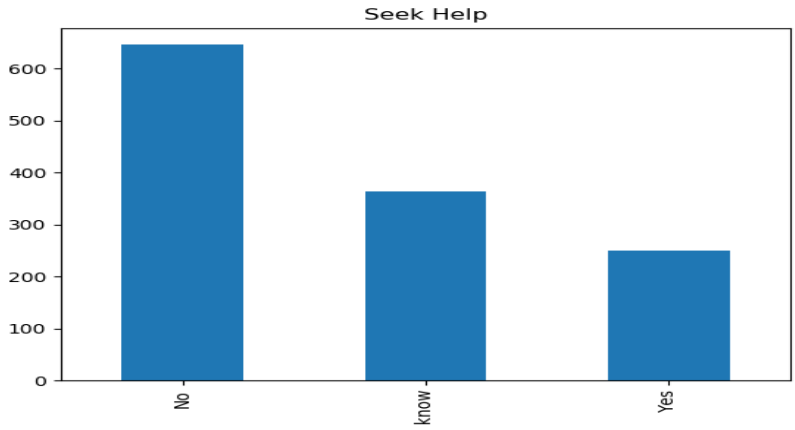
The following screen shows the Visualization of Care options



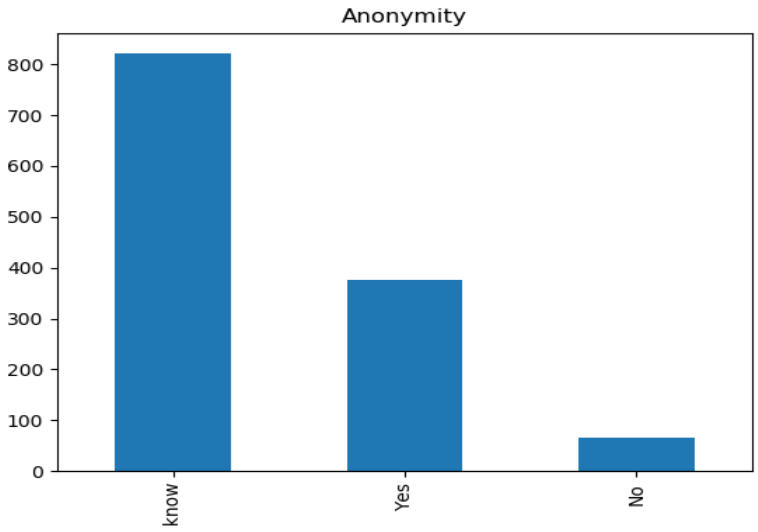
The following screen shows the Visualization of wellness program



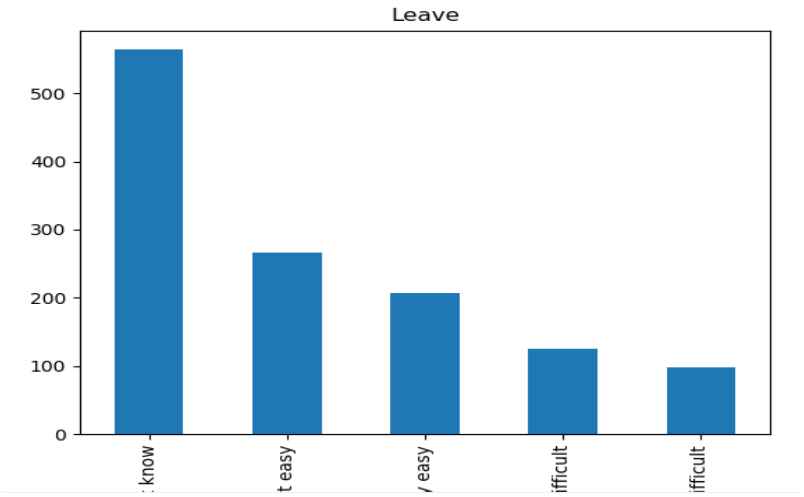
The following screen shows the Visualization of seek help



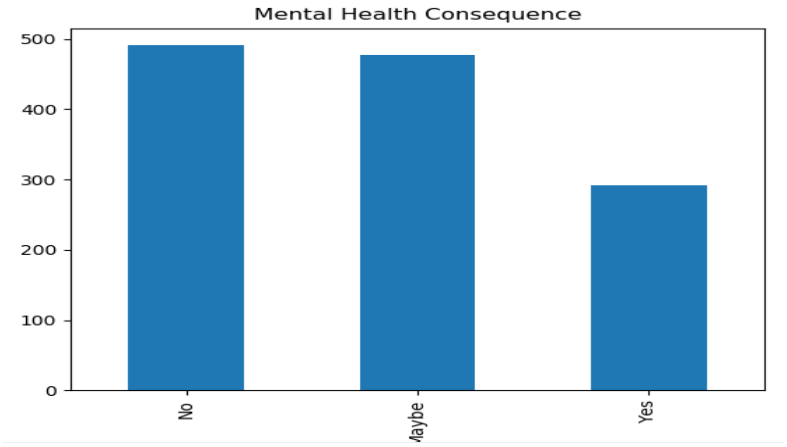
The following screen shows the Visualization of Anonymity



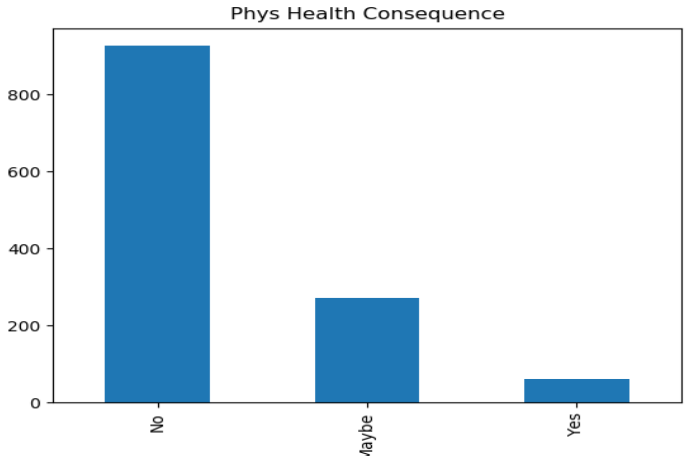
The following screen shows the Visualization of Leave



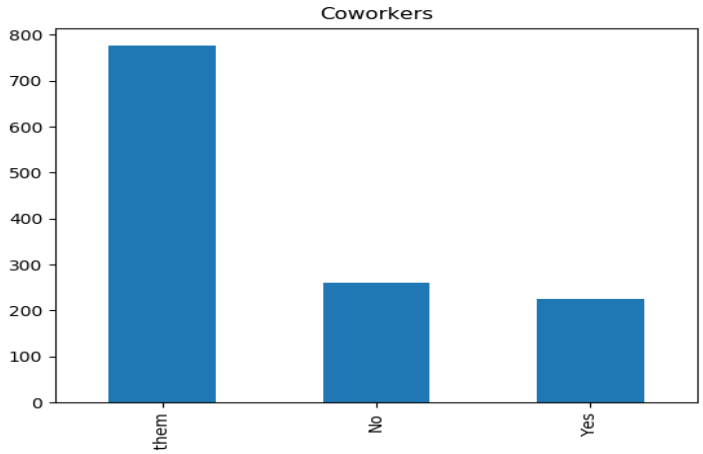
The following screen shows the Visualization of Mental Health consequences



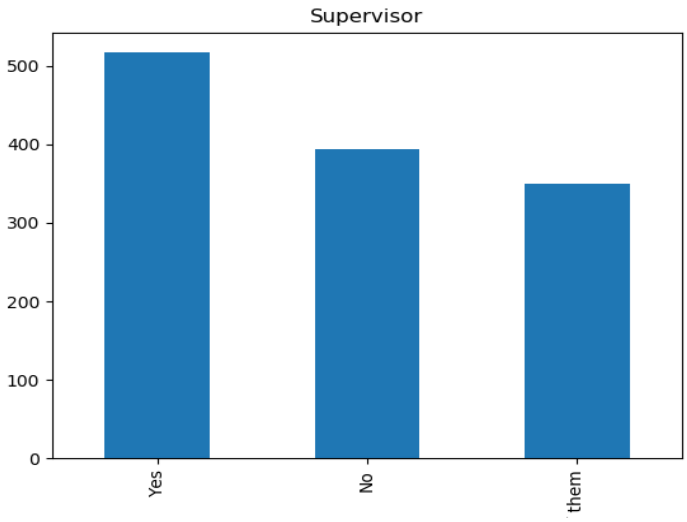
The following screen shows the Visualization of Physical Health consequences



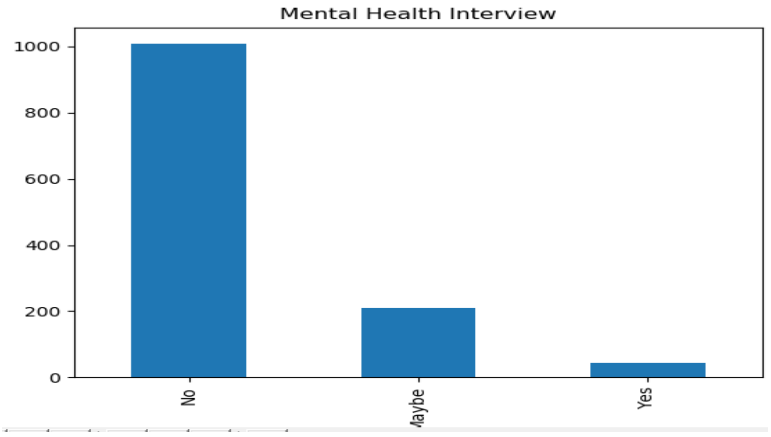
The following screen shows the Visualization of Coworkers



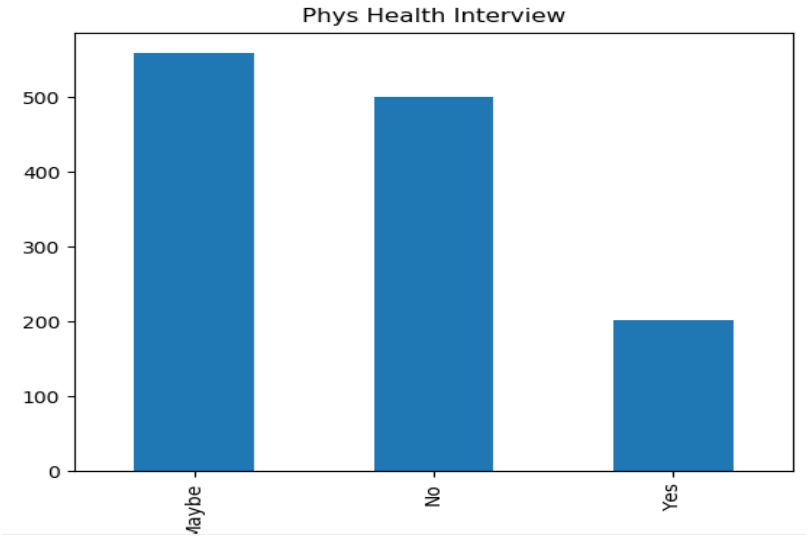
The following screen shows the Visualization of Supervisor availability



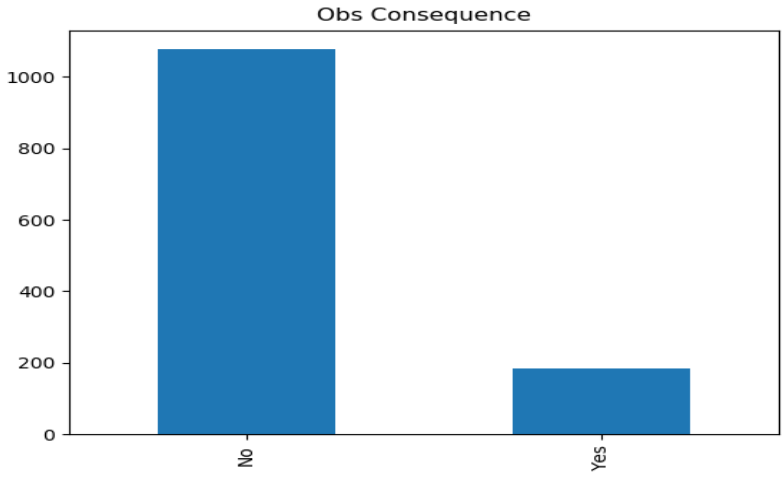
The following screen shows the Visualization of Mental Health Interview



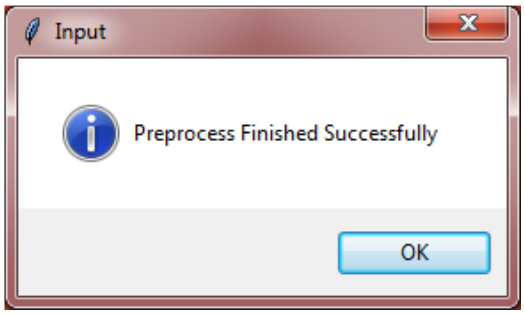
The following screen shows the Visualization of Physical Health Interview



The following screen shows the Visualization of total number of observed consequences



The following screen shows Once the pre-process is completed



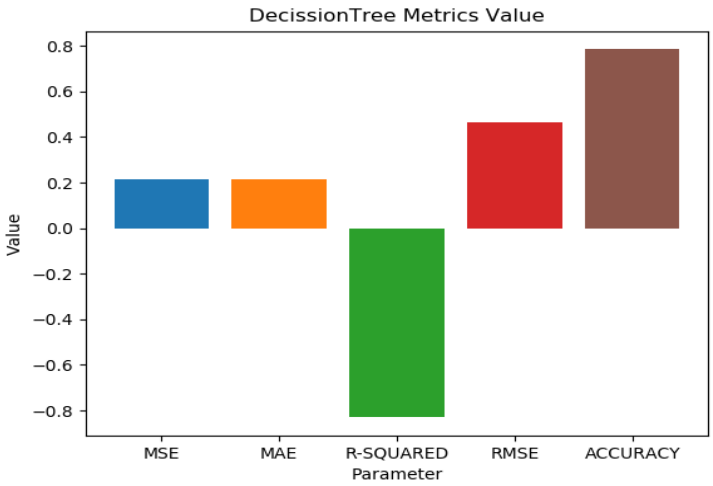


Figure 1.4: Experimental Results of Decision Tree Algorithm

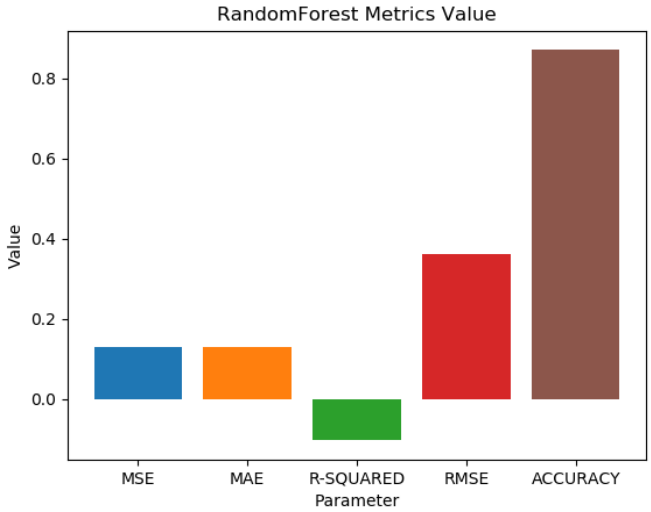


Figure 1.5: Experimental Results of Random Forest Algorithm

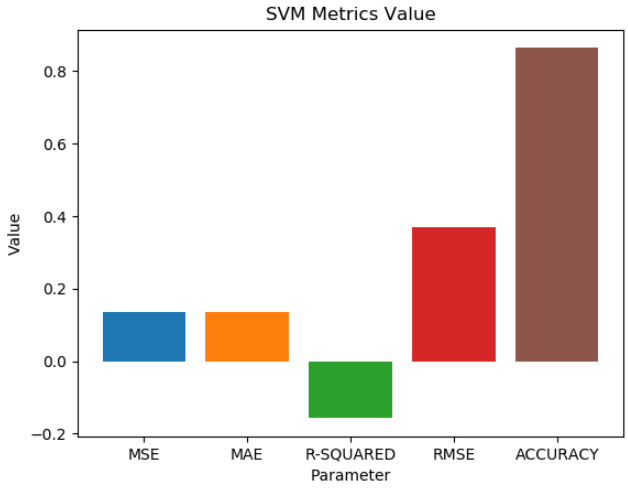


Figure 1.6: Experimental Results of SVM Algorithm

CONCLUSION

There are different methods used to detect depression in people of different ages. The methods employed in these systems utilize assessment methods by analyzing psychiatric disorder ratings in questionnaire sets to predict levels of depression in different age groups. Machine learning algorithms are used to detect mental disorders. A data set of 1200 samples is considered for investigation. We used SVMs, decision trees, and random forests for training and recognition. Experimental results show that random forest achieves the highest accuracy of about 87%.

In the future, extending my work with deep learning models such as neural networks and convolutional neural networks.

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