ANALYSIS OF NO-MO-PHOBIA USING SUPPORT VECTOR MACHINE

Punam Devi, Ankur Sharma, Anurag Rana

Abstract

With the emergence of technology the development has been done but it also have negative effect over people. One of them is nomophobia that is defined as fear and anxiety in people due to unreachable to their mobile. There are research on this using the various factors but the factor like age, interest has not yet been analysed. In the proposed methodology we consider various factors like personality , age , self esteem , gender as a predictors to the disease nomophobia. The questionnaires have been prepared and evaluated using various data mining tools. The results have been shown more accuracy as compare to other existing methodologies.

Keywords: nomophobia, data mining,

Introduction

Nomo phobia means “the fear of being out of mobile phone contact”. the fear of being without mobile phone or for some reason being unable to use, such as the absence of a signal ,running out of battery power, forget to take the phone with them, not receive calls, texts or email notifications for some time . Mobile phones were originally seen as a gadget for communication but currently, the internet enabled mobile phones have become an integral part of our daily life. Their benefits are incomparable but at the same time, they have some negative effects too.

It is a emotional fear of losing mobile phone contact. Nomo phobia is consider a modern age phobia and a by product of the communication between people and new technologies. Data is composed from phone users and analyzed using multi-group path examination support our model .the proposed indirect effect is non- significant only when situational certainty and controllability come together is showed in result, that is, when people know for how long they will not be able to use their phones and when they have control over the situation. A nomophobe is a noun and refers to someone who is afflicted with nomophobia. on the other hand, is an adjective and is used to describe the kind of nomophobes and/or behaviors related to nomophobia.the 2012 study found out that women were more subject to nomophobia, with 70% of the women compared to 61% of the men expressing feelings of anxiety about losing their phone or not being able to use their phone. the study found that young adults, aged 18-24 were most prone to nomophobia with 77% of them identified as nomophobic,followed by users aged 25-34 at 68%.Impact of HCI on Economy, both in computers and robotics means that many manufacturing tasks can now be completely automatic. Factory machines are easier to use than human workers on production lines for things like cars. The distribution of documents and other files has become much easier thanks to technologies like email and text messages. phone technology takes this further since documents can be edited and sent while the user is on the go. The development in HCI technology has increased people’s productivity extremely.

Literature Survey

1.**Goswami et.al [1]** Mobile phone usage is so strongly integrated into young people's behaviour that symptoms of behavioural addiction, such as cell phone usage interrupting their day –to-day activities. Negative effect of phone addiction on students and addressing the role of phone addiction on student's mental and physical health.

2. Igarashi et.al [2] A survey was conducted to investigate how self-perception of text-message dependency leads to psychological/behavioural symptoms in relation to personality factors. Although message frequency was significantly related to psychological/behavioural symptoms. self-perception of text-message dependency strongly affected psychological/ behavioural symptoms.

3.kang et.al [3] This study deals with two studies that develop and compare a measure and model of hierarchical needs of phone use from US and Korean users. The first study examines the dimensionality of measure by conducting an exploratory factor analysis on 398 US and 331 Korean college students. The second study examines the relationships between the SBN and use behaviour, which leads to life satisfaction.

4. Nancy et.al [4] Overuse of wireless mobile devices (WMDs) may be associated with a form of psychological dependency, of which a prominent feature may be anxiety arising from separation from these devices. College students, who are among the most avid consumers of WMDs, might be susceptible to the negative effects of WMD overuse. The present study examined anxiety in American college students when their WMDs were unexpectedly not available. Upon arrival, approximately one half of the 163 participants were randomly assigned to have their WMDs removed from their possession; the other half was allowed to keep their WMDs but were required to turn them off and place them out of sight.

5. King et.al [5] In this report, we present and discuss a hypothesis for the development, in individuals with panic disorder and agoraphobia, of dependence on his or her mobile phone (MP). This disorder, termed nomophobia, is a result of the development of new technologies. Nomophobia is considered a disorder of the modern world and refers to discomfort or anxiety caused by being out of contact with a MP or computer. It is the pathologic fear of remaining out of touch with technology.

6. Park et.al [6] This study examined the factors affecting the South Korean people's use of phones within the framework of the technology acceptance model (TAM). Using an in-person survey ,the study confirmed the propositions of the TAM. The study also included individuals' psychological antecedents, such as motivations for social inclusion and instrumental use of phones, innovativeness, behavioural activation system (BAS), and locus of control.

7.Cearslan et.al [7] The present study investigates the roles of phone usage, self-regulation, general self-efficacy and cyber loafing in phone addiction. We conducted an online survey which received responses from 598 participants attending a public university in Ankara, Turkey. The results showed that both the duration of phone usage and cyber loafing positively affected phone addiction

8. Mohammad et.al [8] We explored the frequency and indices of phone addiction in a group of King Saud University students and investigated whether there were differences in phone addiction based on gender, social status, educational level, monthly income and hours of daily use. We developed a questionnaire probing phone addiction consisting of five dimensions: 1) overuse of phone, 2) the psychological-social dimension, 3) the health dimension, 4) preoccupation with phones, and 5) the technological dimension

9. Salehan et.al [9] Social networking on phones: When mobile phones become addictive. there is a large growth in the use of mobile phones especially among the youth. This trend is followed by the fast growth in use

of online social networking services (SNS). Extensive use of technology can lead to addiction. This study finds that the use of SNS mobile applications is a significant predictor of mobile addiction. The result also shows that the use of SNS mobile applications is affected by both SNS network size and SNS intensity of the user. This study has implications for academia as well as governmental and non-for-profit organizations regarding the effect of mobile phones on individual's and public health.

10. Sharma et.al [15] recent cross-sectional study examining nomophobic behaviours of Indian medical students has reported that almost 75% of the participant students are nomophobes (i.e., a noun referring to a person with nomophobia), and 83% experience panic attacks when they cannot access their mobile phones.

11.Yildirim et.al [16] argue that phones increase the severity of nomophobia due to their numerous capabilities (e.g. Internet access, social media and other applications, instant notifications), leading to an increase in users' involvement with their phones and more intense feelings of anxiety and distress when they are unable to use these capabilities. Considering the proliferation of phones in Turkey, as evidenced by the increase in the phone penetration rate from 14% in 2012 to 39% in 2014 (Consumer Barometer, n.d.) and the adoption of phones mainly by young adults (Nielsen, 2013), investigating the prevalence of nomophobia among Turkish young adults will contribute to the understanding of how mobile technologies are impacting young adults in Turkey. Therefore, the purpose of the current study was to investigate the prevalence of nomophobia among Turkish young adults and demographic factors affecting their nomophobic behaviors.

12.Toda et.al [14] (Excessive Mobile Phone Use Literature) Toda et al. (2004) developed the MPDQ to investigate mobile phone dependence (ascited in Toda et al., 2006). Since the original study in which the questionnaire was created and validated was published in Japanese, the questionnaire development procedures are cited from other sources. The items in the questionnaire were created based on the excessive mobile phone use literature (Billieux, 2012). The 20-item questionnaire (4-point rating scale) was validated by the authors, and the reliability of the questionnaire was proved. This study was one of the first attempts to identify mobile phone use as dependence.

Proposed Method

N=max (Dataset)

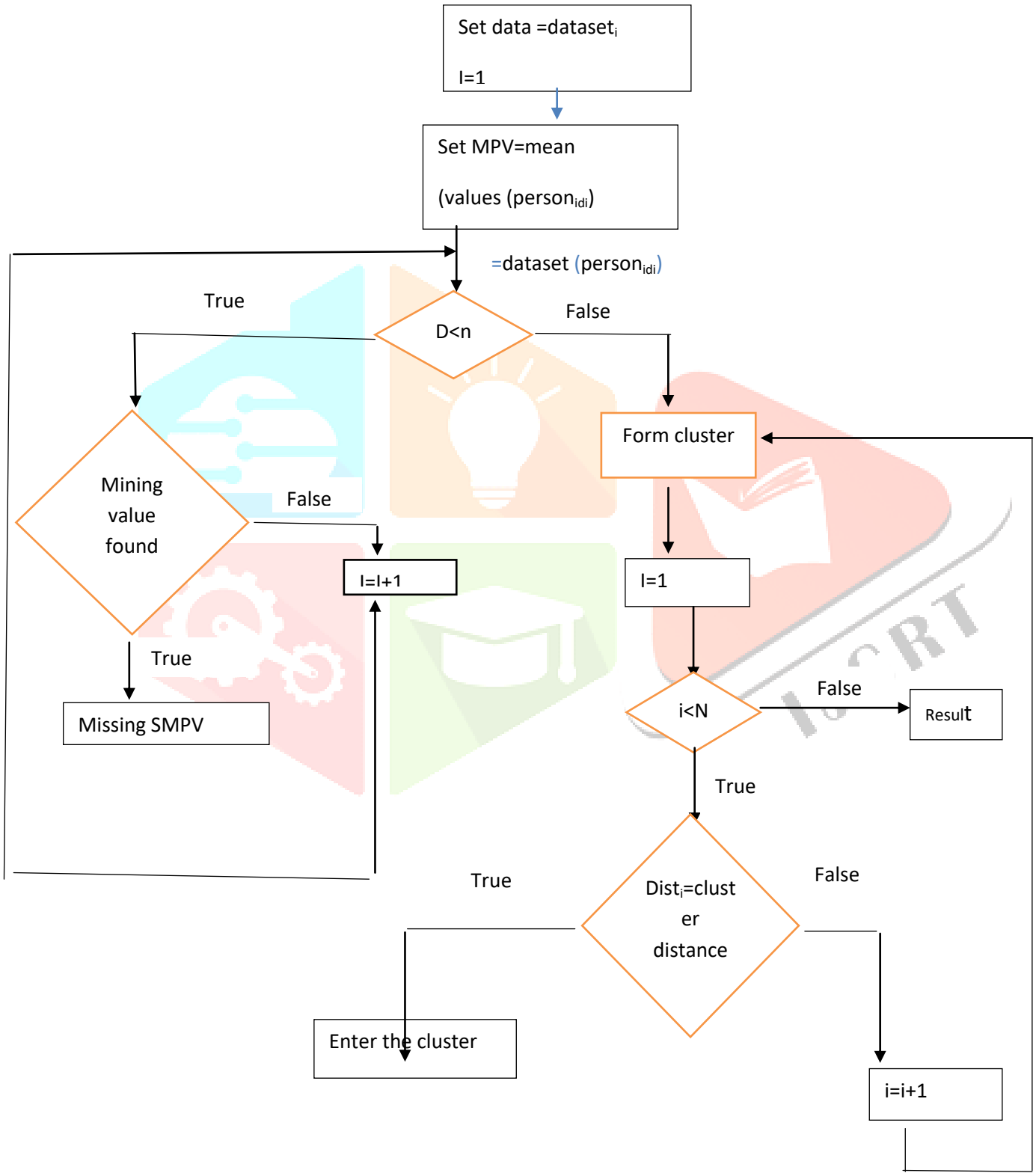

FIGURE 3.5 Flowchart specifies the steps required to reach the goal

The proposed algorithm uses the SVM algorithm for determining patterns which can be grouped together to form clusters. Pre-processing mechanism includes most probable value replacement with the missing value.

The algorithm takes into consideration the missing values which may be present while gathering the data from the users. The gathered data is passed from pre-processing phase. The noise and missing values are replaced with the most appropriate value using mode of the values obtained. The highest frequency value is held in place of the missing value. The validity check mechanism using z-test is conducted. The correlation analysis is also conducted to determine the validity of replaced values.

To verify the validity, information extracted is fed into the system meant to check correlation. To do this Matlab statistical tool is used. Checking validity using correlation analysis requires two distinct correlation groups. In order to accomplish this, age and gender attributes are considered. Gender field however is of text type. In order to analyse the validity, Gender field is converted into numeric data where males are represented with '0' and females are represented with '1'. The z-rule is nothing but the values of correlation(r)-values. The correlation values are obtained for distinct group of people based on age. All these correlation values are grouped to form z-score. The equation used to obtain z-score is given as under

$$z - score = \frac{z_1 - z_2}{\sqrt{\left(\frac{1}{N_1} - 3\right) + \left(\frac{1}{N_2} - 3\right)}}$$

Equation 1: Z-score calculation mechanism

N_1 is the total values in age group and N_2 is the total values in Gender field. The threshold is set to 0.5 and Z-score obtained from the equation is 0.3 proving the validity of information fetched.

The obtained dataset is fed into the excel sheet. The formula specified for grouping the information is on the basis of age groups is give as under

Infant	Young	Adult	Old
$10 < Age$	$Age \geq 10\ and\ Age \leq 25$	$Age > 25\ and\ Age \leq 45$	Age>45

Table 2: Grouping on the basis of Age

Once the pre-processing phase is complete. Next phase is to fed the data into the SVM for training. The training process takes the text and fed into hyper planes. The kernel value for classification is set to 0.5. The hyper planes penetration is used to determine weather there is a nomophobia or not. The algorithm for the same is given as under

Algorithm

- Input: Dataset
- Output: Classification Accuracy, Disease Prediction

- Input Dataset
  Data=$Dataset_i$
  Where I are the number of rows within the dataset
- Apply Pre-processing mechanism to resolve the missing values
  MPV=mean (Values($Person_{id_i} = dataset(person_{id_i})$))

- Repeat while all the missing values are tackled
  If ($Missing_i$)
  $Missing_i$=MPV
  End of if
  End of loop
- Apply Pre-fix span algorithm for pattern growth determination
- Form clusters
  Repeat until values in dataset are examined
  If($Datset_{iValue}$==$Dataset_{i+1value}$)
  $Cluster_i$= $Datset_{iValue}$
  End of if
  I=i+1
  End of loop
- Predict disease looking at the pattern clusters
- Result: Accuracy, Disease

Results and discussion

Naïve Bayes

Naïve Bayes classifier is one of the efficient and highly scalable inductive learning algorithm which is trained in a supervised learning strategy . It assumes all the attributes are conditionally independent for evaluating class conditional probability .

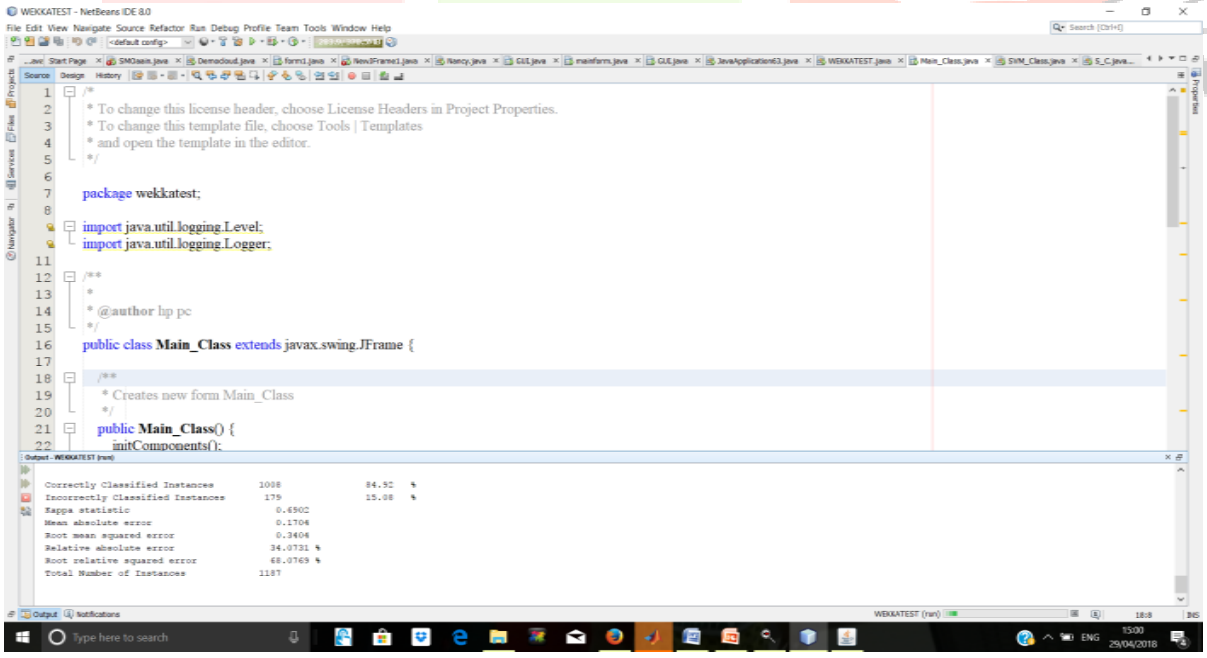

FIGURE: 5.1 Naïve Bayes output

Decision Tree Classifier

It is a tree based classifier which is used in classification of algorithms [51].It builds decision tree and then applied this tree to all instances of the dataset. It uses the concept of Information gain to choose the best split .Root node is selected which has maximum information gain of the attribute.

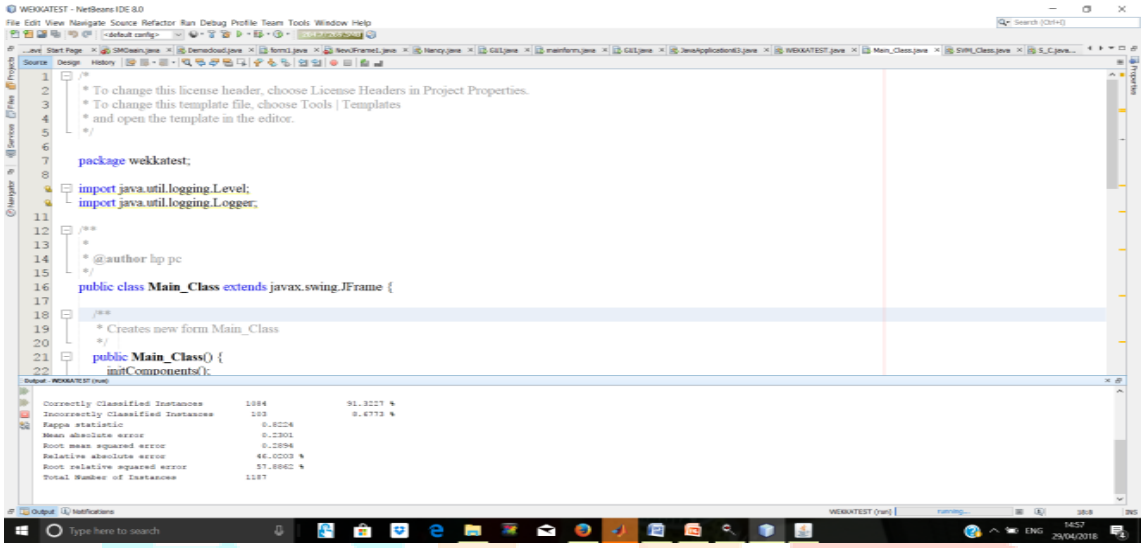

FIGURE : 5.2 Decision tree output

Random Forest

This algorithm builds a randomised decision tree in each iteration of the algorithm and produces excellent predictors. Every sub tree gives a classification and provides the tree votes for that class [52]. Then the classification is done which is having the most votes. The following are the basic steps in the algorithm:

i) Suppose the number of samples in the training set is X, then these samples will be the training set for building the tree.

ii) Suppose there are Y input variables, a number y<<Y is specified as at every node, m variables are selected randomly out of Y and then the best split on these y is used to split the node. The value of y is unchanged during the forest build [18].

iii) Every sub tree is built to the largest extent possible. Out of 1187instances, 1170are classified accurately which results in higher accuracy rate of 97% and 17 are incorrectly classified.

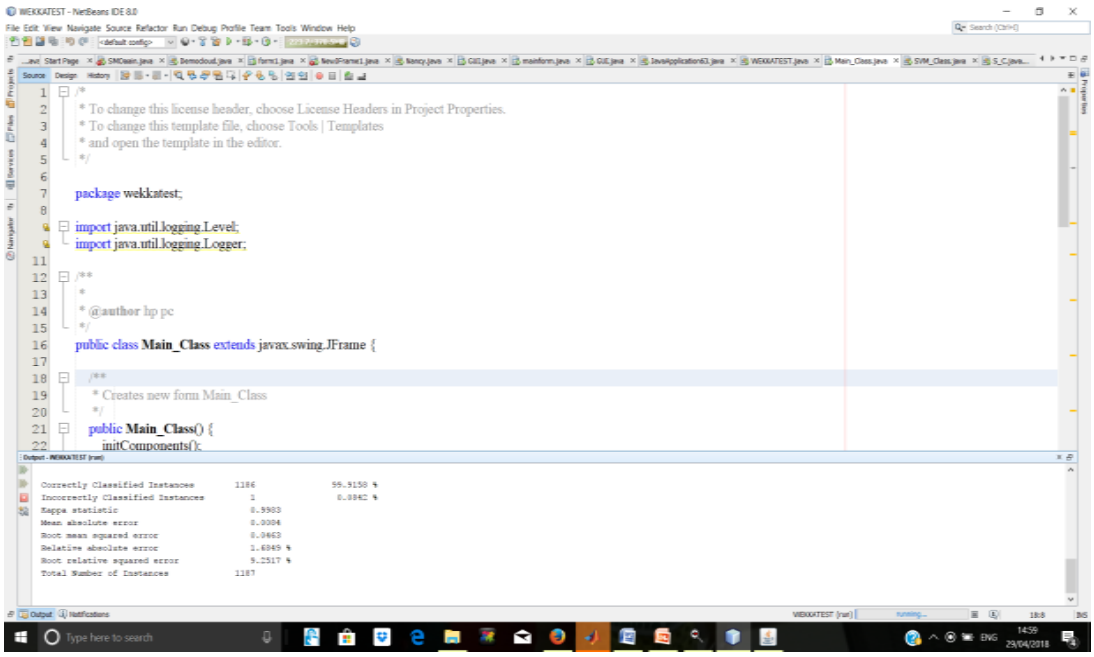

FIGURE: 5.3 Random forest output

Support Vector Machine

In machine learning, support vector machines are supervised learning models with associated learning algorithms that analyze data used for classification and regression
analysis. The support vector clustering algorithm created by Hava Siegelmann and Vladimir Vapnik applies the statistics of support vector machines algorithm, to categorize unlabeled data, and is one of the most widely used clustering algorithms in applications.
Out of 1187instances, 1170are classified accurately which results in higher accuracy rate of 98.56% and 17 are incorrectly classifier

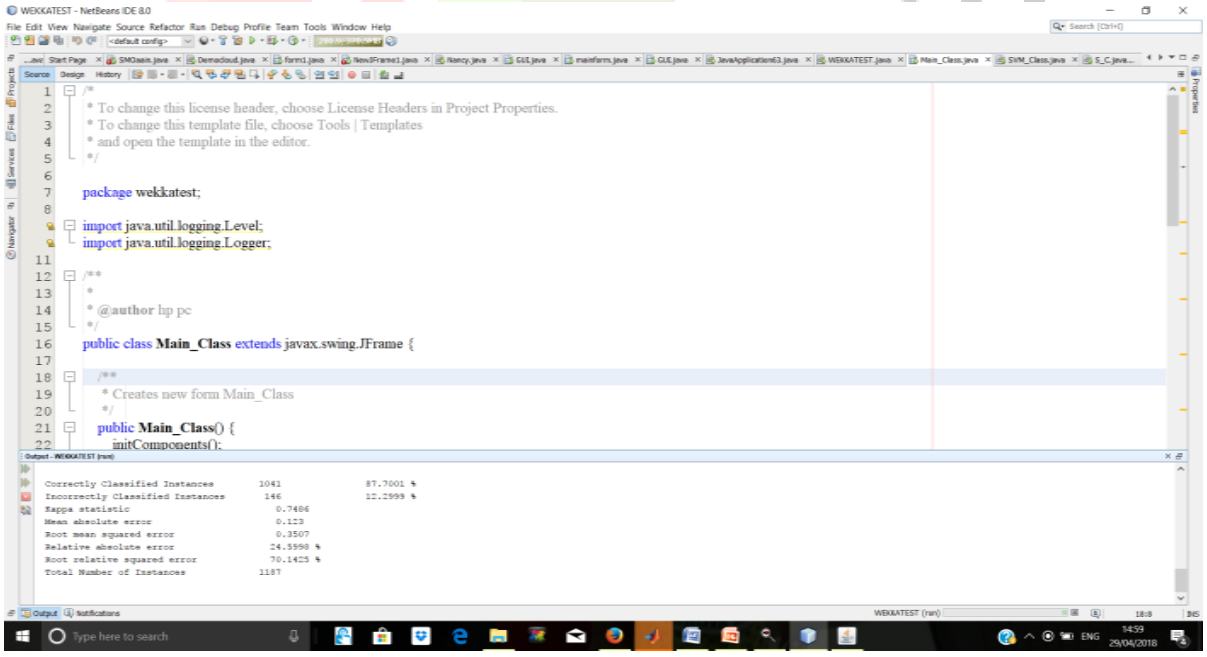

FIGURE: 5.4 Support vector machine

This compares the classification accuracy of the supervised algorithms namely Naïve Bayes, J48, Random Forest and support vector machine. All simulations were performed using WEKA machine learning environment integrated with NETBEANS which consists of collection of popular machine learning techniques that can be used for practical data mining.

Conclusion

Proposed work provides the mechanism to evaluate the problems originating through the use of Mobile phones. The lack of usage of mobile phone can lead to the curiosity and person can feel irritated. This problem is known as Nomo phobia. In order to determine the problems at early stage, this work using support vector machine is carried out. Also the problems originating through mobile phone are predicted using other classifiers also. This is done in order to perform comparative analysis of the proposed work. The classification accuracy achieved through the use of support vector machine is considerably high as compared to previous work of naïve bayes and J48 algorithm.

Future Scope

Proposed work evaluates the MOBILE RELATED problems such as No-Mo-Phobia using different machine learning algorithms by WEKA Tool integrated with Netbeans. Compare the results in terms of time taken to build the model and its accuracy. WEKA is an efficient approach and outperforms other data mining approaches. This work shows the Random Forest is best classifier for MOBILE RELATED of WEKA tool because it runs efficiently on large datasets. In
future we will use different classifiers on different datasets and evaluating the performance of each classifier.
These techniques are preferable as compared to model driven approaches since they are least expensive and future predictions are accurate. Overall this phenomenon provide help in future research regarding prediction and fault tolerance.

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