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Analysis of Temperament (Mizaj) by Using Different Data Mining Techniques

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ABSTRACT

There are various classes of temperament of the persons. Mizaj is the same as temperament in Unani pathy in Arabic. Here we have collected the data on different attributes various backgrounds and field for both male and female persons from Unani medical College, Pune. We have tried to classify and find the relation between anger and reaction of the person using the different classification models.

We have tried to classify the data using the various model and we found the Naive Bayse (NB) with train set data model showed good classification in four classes with less relative absolute error and compare to J48 model. The from the confusion matrix it is observed that the data has been correctly classified by Naive Bayse model. The percentage classification of the data as 42 %of bilious, 23 % of Phlegmatic, 32 % sanguine and 3 % of Malencholic type. As generally the Malencholic type persons are observed very rarely therefore it show less % of Malencholic type. The NB Tree shows that there is strong relation between the cold reaction and the anger. Depending upon the level of the anger the person gets troubled. Thus based on the anger the temperament is classified into different types.

Keywords: Data Analysis, Temperaments, Naïve Bayse Model, True Positive, False Positive, Classification, Apriory Algorithm **.**

INTRODUCTION

Unani pathy[2] is a science which deals with health and disease. Today India is one of the leading countries so far as its practices concerned. It has the largest number of Unani educational, research and healthcare institutions. According to Unani pathy the human body is considered to be composed of different natural components. Temperament (Mizaj) is one of them and it indicates the properties of an atom (Unsur) a molecule, a cell, a tissue, an organ and of the organism as a whole. Each and every atom, molecule (murakkab), humour (khilt) cell, organ and body as a whole is furnished with a mizaj (equilibrium) upon which their properties, functions and life depends. In fact, it is the complete mirror of the chemical state of the human body and indicates environment & homeostasis of the body. Temperament as defined by Avicenna (Ibn sina) is the new state of a matter with different quality from that present in the element or compounds before coming into imtizaj (intermixture or chemical combinations) which results from the action & reaction among the contrary qualities and powers present in the atoms of different elements when they are combined together.

Mizaj indicates the principles of chemical combination of different elements (or compounds) to form a new compound, having new properties altogether different from those of the elements (or compounds) possessed by them previous to coming into combinations (imtizaj). Mizaj indicates the state of equilibrium in a compound with respect to required number of atoms and molecules of different elements and their ratio to that particular compound and the state of homeostasis in a cell or in the entire body upon which the life of the cell and the entire organism depends. Therefore, here we have collected the data of peoples from different field and region for different instances. We have tried to analyze the data and to find the various types of the temperament observed between the various peoples and which are generally observed in the majority of the peoples. This is carried by applying the various classification models of data mining techniques and found the suitable model which classifies the data into four different classes correctly. We have also tried to fond the relation between the attributes by applying the NB Tree model and the apriory algorithm

DATA COLLECTION

The observational data of different peoples with their behavior and attributes were collected from different region over India. This was collected by the Unani Medicle College Students, Azam Campus, Pune. The data was collected wide variety of peoples varying from house wife to business persons for 67 Instances and collected for 40 attributes. The data was verified by the expert doctor from Unani medical college, Azam capus, Pune. The collected data fed in excel sheet and it is converted to Comma Separated Values (CSV) format and it was sued for the further analysis.

DATA ANALYSIS

The various classification models[1] were applied to classify the data. Starting from the Naive Bayse to Naive Bayse Tree model by using data mining tool WEKA [6]. The model were iterated over number of iterations and observed the statistical parameter for the different models as given in Table 1. From the comparison of various parameters for different models, it is observed that the Naive Bayes model with Train set data model shows minimum absolute mean error and relative absolute error as compare to other models. Also the average weights of the True Positive (TP) rate and their relative parameter are given in Table 2. It shows that the Naive Bayes model with Train set data model gives higher values True Positive (TP) rate and their relative parameter compare to the other models and minimum values of False Positive(FP) rate. The minimum value of Relative absolute error (i.e. 35.809 %) shows better classification of the given data. From Table 1 it is also observed that the 52 instance are correctly classified and 15 are incorrectly classified as compare to other models. The data is classified in to four classes as Bilious, Phlegmatic, Sanguine, Melancholic etc. Out of 67 instances 42 % instances corresponds to bilious, 23 % instances corresponds to Phlegmatic, 32 % instances correspond to Sanguine and 3 % instances corresponds to Melancholic type. It shows that the majority instances are correspond to Bilious and Sanguine class and rare cases of Melancholic type are observed. This can be noted from the confusion matrix shown in Table 3. The relation between anger and the reaction can be observed from the Fig.1. It shows that there is strong relation between the anger and cold reaction. The cold reaction has highest gain factor as compare to other attributes and it is followed by the anger. The person will be comfortable when the reaction is cold and he is not comfortable when is in anger. Thus the anger depends on the different attributes of the person[3,4]. Depending up on the different level of the anger the classification of the temperament is done. We have also tried to find the out the relation between different attributes by appling the apriory algorithm. We found the high confidence coefficient raging from 0.95-0.98 between some attributes. These attributes shows the strong relation between them when the reaction speed is fast, and reaction strength is high then the movement is fast and the person fear is less. Also we observe that if the movement is fast then condition of muscle must be soft and then skin must be soft. This implies the person bearing these attributes must fear less and he/she may feel comfortable.

CONCLUSION

From the result analysis of the data it is observed that the there are four types of temperaments in the peoples; these depends upon their different attributes. These are Bilious, Phlegmatic, Sanguine and Melancholic. We also found that the Naive Bayse with train set data model classifies the data more correctly as compared to other models. It also shows that the majority instances are correspond to Bilious and Sanguine class and rare cases of Melancholic type temperament are observed as expected. The J48 Tree show that the there is strong relation between different attributes and the anger. The data is classified depending upon different attributes of the persons. Thus depending up the level of the anger and cold reaction the temperament is classified into different classes. We also tried to find the relation between attributes by applying the apriory algorithm and J48 model. The attributes shows the strong relation between them when the reaction speed is fast, and reaction strength is high then the movement is fast and the person fear is less. We also observe that if the movement is fast the condition of muscle and skin must be soft.

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Table 1: Different Model Static Analysis comparison

Model/Description	NB (10 fold)	NB (Train Set)	NB (% Split)	BF Tree	J48	NB Tree
No. of Instances	67	67	23	67	67	67
Correctly Classified Instances	25	52	8	49	25	62
Incorrectly Classified Instances	42	15	15	18	15	5
Kappa statistic	0.035	0.658	0.009	0.569	0.653	0.884
Mean absolute error	0.308	**0.118**	0.314	0.202	0.166	0.048
Root mean squared error	0.483	**0.261**	0.507	0.318	0.288	0.167
Relative absolute error (%)	93.27	**35.809**	93.17	61.38	50.37	14.79
Root relative squared error (%)	119.2	119.20	64.470	112.6	78.64	41.40

Table 2. Comparison of average Weights for various Models

Models / Avg. Weight	NB (10 fold)	NB (Train Set)	NB (% Split)	BF Tree	J48	NB Tree
TP Rate	0.373	**0.776**	0.348	0.731	0.776	0.925
FP Rate	0.373	**0.124**	0.345	0.177	0.118	0.053
Precision	0.375	**0.783**	0.342	0.742	0.763	0.915
Recall	0.373	0.776	0.348	0.731	0.776	0.925
F-Measure	0.372	0.778	0.321	0.715	0.769	0.918
ROC Area	0.535	**0.945**	0.566	0.832	0.906	0.995

Table 3. Confusion Matrix for NB (Train set) Model

Classified as	a	B	c	D
a = Billious	22	1	6	0
b = Phlegmatic	1	12	2	0
c = Sanguine	4	1	17	0
d = Melancholic	0	0	0	1

Figure 1. J48 classification tree of the attributes