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An Overview on Women Health in Chhattisgarh Using Artificial Intelligence

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Abstract: *Data Mining has been successfully used in various fields like e-business, marketing, health sector etc. Data Mining along with the amalgamation of Artificial Intelligence gives a perfect situational analysis regarding women health condition of Chhattisgarh. Data Mining tools are widely used in analysis of huge collection of data which are saved in databases and information repositories which are not possible to be done by humans. This paper particularly stresses in the analysis of the women's health in Chhattisgarh using Data Mining tools along with the amalgamation of the concept of* ***Naïve Bayes Algorithm, ANN Algorithm*** *and* ***K Nearest Neighbors Algorithm****. This analysis further improves with the addition of the concept of Genetic Algorithm. Genetic Algorithm further reduces the actual dataset, so that the optimization takes place in less amount of data resulting in result that is more accurate.*

Index Terms **– Chhattisgarh, Women, Artificial Intelligence, Algorithm.**

I. INTRODUCTION

Chhattisgarh is a four year old state. Although major part of the population lives in urban areas but still a lot of people live in villages. Some villages that lies in remote areas are very difficult to access. Accessing remote areas geographically also becomes difficult. In such circumstances, providing health facilities in those remote areas also becomes difficult. Specially, Women living in those remote areas suffers a lot especially in terms of health. The factors affecting health are levels of literacy among women and the various socio cultural practices of the state.

Some prominent characteristics of women's health in Chhattisgarh as revealed through data collected by the National Family Health Survey. Two (NFHS-2) and the Sample Registration System (SRS) are as follows:

Marriage Pattern:

1. 34% of women are married in the age group of 15 to 19 years in Chhattisgarh.
2. The median age of marriage of women in the age group of 20 to 49, is 15.4 years in

Chhattisgarh.

Fertility Pattern:

1. The total fertility rate (TFR) i.e. the number of children per women of completed fertility is 2.8 in Chhattisgarh, which is below the national average. This implies that literacy is not a key factor in influencing the TFR.
2. One indication of fertility behavior is the proportion of births of order 3 and above, which is 48% in Chhattisgarh.
3. Regarding current use of contraception, Chhattisgarh has a record of 45%, which is the highest percentage of contraceptive use among the three newly formed states of India.
4. The figure of female sterilization is 35%, and it is the dominant method of contraception.
5. As in other parts of India, the men seemed to have walked out of the family planning program.
6. The male sterilization accounted for less than 3% in Chhattisgarh.
7. The use of other female contraceptive methods like oral pill and IUD was less than 2%.
8. 43% of all women in Chhattisgarh with two living children wanted additional children.

The issue of empowerment of women is a complex subject and it will be too simplistic to identify just literacy and education as the dominating factors in influencing the fertility behavior and the decision making process. The over emphasis on female sterilization in the government family planning program creates a supply driven phenomenon. It may be easy to rope in illiterate tribal women in sterilization camps. The issue of empowerment of women depends more on social, economic and cultural factors.

1. The percentage of births where mothers received antenatal checkups from a health professional is 58%.
2. As for births assisted by medical or health professional in Chhattisgarh, it is 22%. In the case of births assisted by ANM / Nurse / Midwife / LHV, it was only 10% in Chhattisgarh.
3. The role of traditional birth attendants (Dai) is quite significant. In Chhattisgarh, this percentage amounts to 43.
4. Only 22% of children in Chhattisgarh received all vaccinations.
5. The figure for chronically undernourished children (6-35 months) was 58% in Chhattisgarh.
6. The percentage of women with anemia was as high as 69% in this state.

Factors affecting health status of women

1. Percentage of literate women 31.5%.
2. Percentage of women completed high school and above 8.3%
3. Percentage of women regularly exposed to mass media 58.4%
4. Status of women (percentage involved in decision about own health) 49.2%
5. Status of women (percentage with control over some money) 53.7%
6. Percentage of never married women among all women aged 15-19 is 65.8%
7. Median age of marriage of women aged 20-49 is 15.4%
8. Total fertility rate 2.79%

Fertility and Fertility preferences of women:

1. Mean number of children ever born to women age 40-49 is 4.57
2. Median age at first birth among women age 20-49 is 18.1
3. Percentage of births of order three and above is 48.1%
4. Mean ideal number of children is 3.2
5. Percentage of women with 2 living children wanting another child is 42.6%
6. Current contraceptive use: - any method 45.0%
7. Current contraceptive use: - any modern method 42.3%

9. Current contraceptive use:- Pill . 0.8
10. Current contraceptive use:- IUD . 1.0
11. Current contraceptive use: - Condom 2.1
12. Current contraceptive use: - Female Sterilization 35.1
13. Current contraceptive use:- Male Sterilization . 3.3%
14. Current contraceptive use: - Any traditional method 2.39
15. Current contraceptive use:- Rhythm / Safe period . 1.7
16. Current contraceptive use:-Withdrawal 0.6
17. Current contraceptive use:-Any traditional modern method 0.5
18. Childhood mortality Infant mortality rate 80.9
19. Childhood mortality under 5 mortality rate per 1000 is 122.7
20. Percentage of children born whose mothers received antenatal check up from a health professional 57.5%
21. Percentage of children born whose mothers received antenatal check up in the first trimester 26.7%
22. Percentage of children born mothers who received two or more tetanus toxoid injections 58.2%
23. Percentage of children born whose mothers received antenatal check up from a health professional 54.9%
24. Percentage of children born whose mothers were assisted at delivery by a doctor 22.3%
25. Percentage of children born whose mothers were assisted at delivery by ANM/Nurse/Midwife/LHV 9.7%
26. Percentage of children born whose mothers were assisted at delivery be a traditional birth attendant 42.7%
27. Nutrition. Percentage of women with anaemia 68.7%
28. Percentage of women with moderate / severe anemia 22.6%

Data from the National Family Health Survey about reproductive and Child Health Services received by women in Chhattisgarh shows the following picture:

1. RCH Services received by Women in Chhattisgarh
2. Antenatal Checkup from a health professionals 57.5
3. Antenatal checkup in the first trimester 26.7
4. Pregnant women who has received Two or more tetanus toxoid injections 58.2
5. Pregnant women who has received Iron and folic acid tablets or syrup 54.9
6. Percentage of women whose deliveries were attended by a doctor 22.3
7. Percentage of women whose deliveries were attended by ANM/Nurse/midwife/LHV 9.7
8. Percentage of women whose deliveries were attended by traditional birth attendant 42.7

Adverse pregnancy outcome from environmental factors may include congenital anomalies, increased risk for miscarriage, preterm delivery, intrauterine growth restriction and still birth. Apart from adverse pregnancy outcome, there may be effects on the other reproductive functions like menstrual disorders and infertility. Environmental factors that has been implicated in adverse pregnancy outcome include smoking, video display terminals, anesthetic gases, antineoplastic drugs and exposure to lead, selenium and inorganic mercury. Amongst these, cigarette smoking during pregnancy has been the leading environmental factor for adverse pregnancy outcome. Cigarette Smoking during pregnancy continues to be a significant public health concern. Maternal smoking during pregnancy has been associated with low birth weight(<2500g) Mothers who smoke during pregnancy are twice likely to give birth to low birth weight infants. Similarly air pollution, pesticide exposure, stress have also been associated with low birth weight and preterm delivery. This review gives an overview of the importance of environmental factors in adverse pregnancy outcome.

Smoking

The harmful effects of smoking are well established. Nonetheless, smoking rates among women have remained at high levels for the past 25 years. Despite warnings of the negative consequences of smoking, approximately 20–25% of adult women in the Urban Cities are smokers, with even higher rates among younger women and women of lower socioeconomic status. Concomitant increases in cancer, heart disease, and other diseases directly attributable to smoking has been observed in women. Women of childbearing age represent a large proportion of all female smokers. Smoking during pregnancy is associated with a number of poor birth outcomes, including low birth weight, intrauterine growth retardation, placental problems, preterm delivery and spontaneous abortion. Mothers who smoke during pregnancy are twice as likely to give birth to low birth weight infants (LBW). These infants weigh an average of 150 to 250g less than infants born to non-smoking mothers do. In addition to the hazards of smoking for the mother, exposure to environmental tobacco smoke is a risk factor for Sudden Infant Death Syndrome (SIDS), ear infections, asthma and other respiratory conditions in the infant. Maternal smoking during pregnancy has not only detrimental effect on placental function; nicotine also crosses the placenta to act as neuroteratogen. It interferes with the fetal development, specifically affecting the nervous system. In utero, nicotine targets the fetal nicotinic acetylcholine receptors in the brain, to change the pattern of cell proliferation and differentiation. This results in cell loss and neuronal damage. This in turn has been associated with risks of cognitive and auditory processing deficits and effects on social behavior.

Metals

Lead, mercury, nickel and manganese have been associated with poor reproductive outcome. An increased risk for spontaneous abortion has been associated with low levels of lead exposure. Women exposed to lead include those in paint industry or artist and painters. Lead readily crosses the placenta, and has been found to have teratogenic effects as well as is known to affect the hormonal environment needed to maintain the pregnancy. Lead has also been found to be associated with still births in humans. Women at risk of lead exposure should be monitored for blood lead levels before becoming pregnant. Mercury exposure has been identified in dental assistants preparing amalgams. This has been linked to spontaneous abortion as well as reduced fertility.

Inhalational Anesthetics

Evidence supporting inhalational anesthetics and adverse pregnancy outcome are weak. It has been found the presence of increased risk for infertility in dental assistants exposed to higher concentration of nitrous oxide. Limitation of exposure should be considered for workers where operating rooms are not properly scavenged.

Organic Solvents

Women working in clothing, textile, paint and plastic industries and health care professionals are exposed to organic solvents. Women exposed occupationally to organic solvents had a 13-fold risk of major malformations as well increased risk for miscarriages in previous pregnancies while working with organic solvents.

Air Pollution

It has been associated with congenital birth defects, as well as with low birth weight and intrauterine growth restriction. Women exposed to air pollution showed an association with low birth weight and reduced head circumference in children born to above group of women. Air pollution has also been associated with congenital cardiovascular birth defects. There is a causal link between air pollution and low birth weight.

Pesticide Workers

Pregnant women working in the agricultural fields, landscape artists are at risk for pesticide exposure. The epidemiological literature do suggest increased risk of spontaneous miscarriages, low birth weight and preterm delivery in green house workers. Other potential effects of exposure include infertility, reduced fecundity in women of reproductive age group. Exposed women should have urinary levels quantitated during pregnancy.

Radiation

Exposure to ionizing radiation during periconceptional period and during early gestation has been associated with congenital defects and risks of childhood cancer. Nowadays state laws prescribes that pregnant women should be protected from doses > 1mSv throughout pregnancy. Other common cause of concern is non-ionizing radiation, in particular electromagnetic field waves, as in video display terminals, daily exposure to mobile phones, heated beds, electric blankets and health professionals using diagnostic and therapeutic devices.

Video display terminals do not emit ionizing radiations, but they do emit electromagnetic radiations. Their use during pregnancy has not been associated with adverse pregnancy outcome or to any teratogenic effects. A recent meta-analysis on the subject did not find any increased risk for spontaneous abortion, low birth weight and Prematurity, associated with electromagnetic radiations. Long-term use has been linked with carpal tunnel syndrome, due to the angling effect on the wrist.

Stress

Maternal stress has been found to be associated with birth defects, low birth weight, preterm delivery and early onset preeclampsia. A recent population based case control study found a positive association between maternal stress two months before and after conception. In some cases, job stress and chronic exposure to work has been found to be linked with preterm deliveries. This association is found to be greater in black women. Increased job strain in first 20 weeks of pregnancy has been linked to increased incidence of preeclampsia. It increases the release of catecholamines, associated with increased job stress (OR=2.1 95% CI 1.1-4.1). It has been also found that the risk of having a small for gestational age (SGA) infant increased with an irregular or shift-work schedule alone, or when combined with following occupational conditions: night hours, irregular or shift-work schedule, standing, lifting loads, noise, and high psychological demand combined with low social support.(p value .004) Elimination of the conditions before 24 weeks of pregnancy brought the risks close to those of unexposed women.

Physical Stress

These include long hours of standing, bending, lifting heavy weights, long week hours of work. The adverse pregnancy outcome associated with it include SGA, low birth weight and preterm delivery. SGA is found to be associated with a work > 50h/ week, and with work involving standing > 7h/day. Physical strenuous work, combined with other factors lie stress, poor antenatal care might increase the risk for adverse pregnancy outcome.

2. TECHNIQUES TOWARDS THE RESEARCH

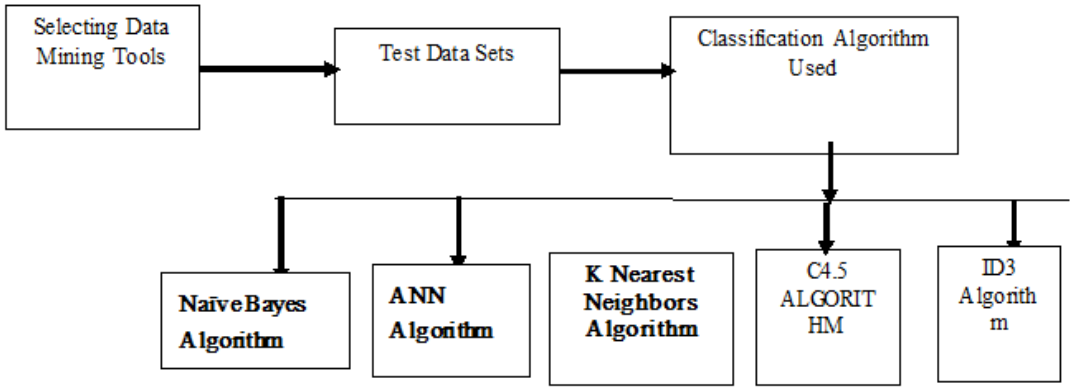
First we made a deliberate research on the topic that requires some research , and then the software's to be used. Then, the procedure to make that analysis much better, like using of Artificial Intelligence. Artificial Intelligence itself is a broad topic, which requires some research to choose the best technique.

3. FINDINGS

3.1 A Comparative study

The methodology of the study constitute of collecting a set of free data mining and knowledge discovery tools to be tested, specifying the data sets to be used, and selecting a set of classification algorithm to test the tools' performance. Fig. 1 demonstrates the overall methodology followed for fulfilling the goal of this research.

Figure 1. Methodology of Study.



3.2 Tools Description

The first step in the methodology consists of selecting a number of available open source data mining tools to be tested. Many open data mining tools are available for free on the Web. After surfing the Internet, a number of tools were chosen; including the Waikato Environment for Knowledge Analysis (WEKA), Tanagra, the Konstanz Information Miner (KNIME), and Orange Canvas.

 WEKA toolkit is a widely used toolkit for machine learning and data mining that was originally developed at the University of Waikato in New Zealand. It contains a large collection of state-of-the-art machine learning and data mining algorithms written in Java. WEKA contains tools for regression, classification, clustering, association rules, visualization, and data pre-processing. WEKA has become very popular with the academic and industrial researchers, and is also widely used for teaching purposes.

 Tanagra is free data mining software for academic and research purposes. It offers several data mining methods like exploratory data analysis, statistical learning and machine learning. The first purpose of the Tanagra project is to give researchers and students easy-to-use data mining software. The second purpose of TANAGRA is to propose to researchers an architecture allowing them to easily add their own data mining methods, to compare their performances. The third and last purpose is that novice developers should take advantage of the free access to source code, to look how this sort of software was built, the problems to avoid, the main steps of the project, and which tools and code libraries to use for. In this way, Tanagra can be considered as a pedagogical tool for learning programming techniques as well.

 KNIME (Konstanz Information Miner) is a user-friendly and comprehensive open-source data integration, processing, analysis, and exploration platform. From day one, KNIME has been developed using rigorous software engineering practices and is currently being used actively by over 6,000 professionals all over the world, in both industry and academia. KNIME is a modular data exploration platform that enables the user to visually create data flows (often referred to as pipelines), selectively execute some or all analysis steps, and later investigate the results through interactive views on data and models.

 Orange is a library of C++ core objects and routines that includes a large variety of standard and not-so-standard machine learning and data mining algorithms, plus routines for data input and manipulation. This includes a variety of tasks such as pretty-print of decision trees, attribute subset, bagging and boosting, and alike. Orange also includes a set of graphical widgets that use methods from core library and Orange modules. Through visual programming, widgets can be assembled together into an application by a visual programming tool called Orange Canvas. All these together make the Orange tool, a comprehensive, component-based framework for machine learning and data mining, intended for both experienced users and researchers in machine learning who want to develop and test their own algorithms while reusing as much of the code as possible, and for those just entering who can enjoy in powerful while easy-to-use visual programming environment.

4. *DATA MINING IN THE STUDY OF CHHATTISGARH WOMEN HEALTH CONDITION*

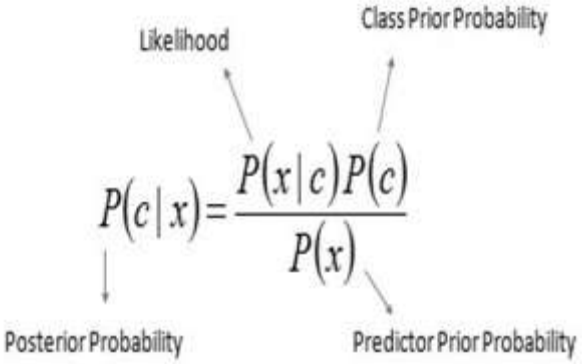
In the study of Chhattisgarh Women Health Condition, we have used the following algorithms:-

Naïve Bayes Algorithm

The Naive Bayes Classifier technique is based on Bayesian theorem and is particularly used when the dimensionality of the inputs is high. The Bayesian Classifier is capable of calculating the most possible output based on the input. It is also possible to add new raw data at runtime and have a better probabilistic classifier. A naive Bayes classifier considers that the presence (or absence) of a particular feature (attribute) of a class is unrelated to the presence (or absence) of any other feature when the class variable is given. For example, a fruit may be considered an apple if it is red, round. Even if these features depend on each other or upon the existence of other features of a class, a naive Bayes classifier considers all of these properties to independently contribute to the probability that this fruit is an apple. Algorithm works as follows,

Bayes theorem provides a way of calculating the posterior probability, $P(c/x)$, from $P(c)$, $P(x)$, and $P(x/c)$. Naive Bayes classifier considers that the effect of the value of a predictor (x) on a given

class (*c*) is independent of the values of other predictors.



$$P(c|X) = P(x_1|c) \times P(x_2|c) \times \cdots \times P(x_n|c) \times P(c)$$

- P(c|x) is the posterior probability of class (target) given predictor (attribute) of class.
- P(c) is called the prior probability of class.
- P(x|c) is the likelihood which is the probability of predictor of given class.
- P(x) is the prior probability of predictor of class.

ANN Algorithm

Artificial neural networks (ANNs) are types of computer architecture inspired by biological neural networks (Nervous systems of the brain) and are used to approximate functions that can depend on a large number of inputs and are generally unknown. Artificial neural networks are presented as systems of interconnected "neurons" which can compute values from inputs and are capable of machine learning as well as pattern recognition due their adaptive nature.

An artificial neural network operates by creating connections between many different processing elements each corresponding to a single neuron in a biological brain. These neurons may be actually constructed or simulated by a digital computer system. Each neuron takes many input signals then based on an internal weighting produces a single output signal that is sent as input to another neuron. The neurons are strongly interconnected and organized into different layers. The input layer receives the input and the output layer produces the final output. In general, one or more hidden layers are sandwiched in between the two. This structure makes it impossible to forecast or know the exact flow of data.

Artificial neural networks typically start out with randomized weights for all their neurons. This means that initially they must be trained to solve the particular problem for which they are proposed. A back-propagation ANN is trained by humans to perform specific tasks. During the training period, we can evaluate whether the ANN's output is correct by observing pattern. If it's correct the neural weightings that produced that output are reinforced; if the output is incorrect, those weightings responsible can be diminished.

Implemented on a single computer, an artificial neural network is normally slower than more traditional solutions of algorithms. The ANN's parallel nature allows it to be built using multiple processors giving it a great speed advantage at very little development cost. The parallel architecture allows ANNs to process very large amounts of data very efficiently in less time. When dealing with large continuous streams of information such as speech recognition or machine sensor data ANNs can operate considerably faster as compare to other algorithms. An artificial neural network is useful in a variety of real-world applications such as visual pattern recognition and speech recognition that deal with complex often-incomplete data. In addition, recent programs for text-to-speech have utilized ANNs. Many handwriting analysis programs (such as those used in popular PDAs) are currently using ANNs.

K Nearest Neighbors Algorithm

The closest neighbor (NN) rule distinguishes the classification of unknown data point based on its closest neighbor whose class is already known. M. Cover and P. E. Hart purpose k nearest neighbor (KNN) in which nearest neighbor is computed on the basis of estimation of k that indicates how many nearest neighbors are to be considered to characterize class of a sample data point. It makes utilization of the more than one closest neighbor to determine the class in which the given data point belongs to and consequently it is called as KNN. The data samples are needed to be in the memory at the run time and hence they are referred to as memory-based technique. T. Bailey and A. K. Jain enhance KNN, which is focused on weights. The training points are assigned weights according to their distances from sample data point. But at the same time the computational complexity and memory requirements remain the primary concern dependably. To overcome memory limitation size of data set is reduced. For this the repeated patterns which don't include additional data are also eliminated from training data set. To further enhance the information focuses, which don't influence the result, are additionally eliminated from training data set. The NN training data set can be organized utilizing different systems to enhance over memory limit of KNN. The KNN implementation can be done using ball tree, k-d tree, nearest feature line (NFL), principal axis search tree and orthogonal search tree. The tree structured training data is further divided into nodes and techniques like NFL and tunable metric divide the training data set according to planes. Using these algorithms, we can expand the speed of basic KNN algorithm. Consider that an object is sampled with a set of different attributes. Assuming its group can be determined from its attributes; different algorithms can be used to automate the classification process. In pseudo code k-nearest neighbor classification algorithm can be expressed,

$K \leftarrow$ number of nearest neighbors
For each object X in the test set do
calculate the distance $D(X, Y)$ between X and every object Y in the training set
neighborhood $\leftarrow$ the k neighbors in the training set closest to X
X.class $\leftarrow$ Select Class (neighborhood)
End for

SR.NO	ALGORITHM	FEATURES	LIMITATIONS
1	C4.5 Algorithm	• Build Models can be easily interpreted. • Easy to implement. • Can use both discrete and continuous values. • Deals with noise.	• Small variation in data can lead to different decision trees. • Does not work very well on a small training data set. • Overfitting.
2	ID3 Algorithm	• It produces the more accuracy result than the C4.5 algorithm. • Detection rate is increase and space consumption is reduced.	• Requires large searching time. • Sometimes it may generate very long rules which are very hard to prune. • Requires large amount of memory to store tree.
3	K-Nearest neighbor Algorithm	• Classes need not be linearly separable. • Zero cost of the learning process. • Sometimes it is Robust with regard to noisy training data. • Well suited for multimodal classes.	• Time to find the nearest Neighbours in a large training data set can be excessive. • It is Sensitive to noisy or irrelevant attributes. • Performance of algorithm depends on the number of dimensions used.
4	Naive Bayes Algorithm	• Simple to implement. • Great Computational efficiency and classification rate • It predicts accurate results for most of the classification and prediction problems.	• The precision of algorithm decreases if the amount of data is less. • For obtaining good results it requires a very large number of records.
5	Support vector machine Algorithm	• High accuracy. • Work well even if data is not linearly separable in the base feature space.	• Speed and size requirement both in training and testing is more. • High complexity and extensive memory requirements for classification in many cases.
6	Artificial Neural Network Algorithm	• It is easy to use, with few parameters to adjust. • A neural network learns and reprogramming is not needed. • Easy to implement. • Applicable to a wide range of problems in real life.	• Requires high processing time if neural network is large. • Difficult to know how many neurons and layers are necessary. • Learning can be slow.

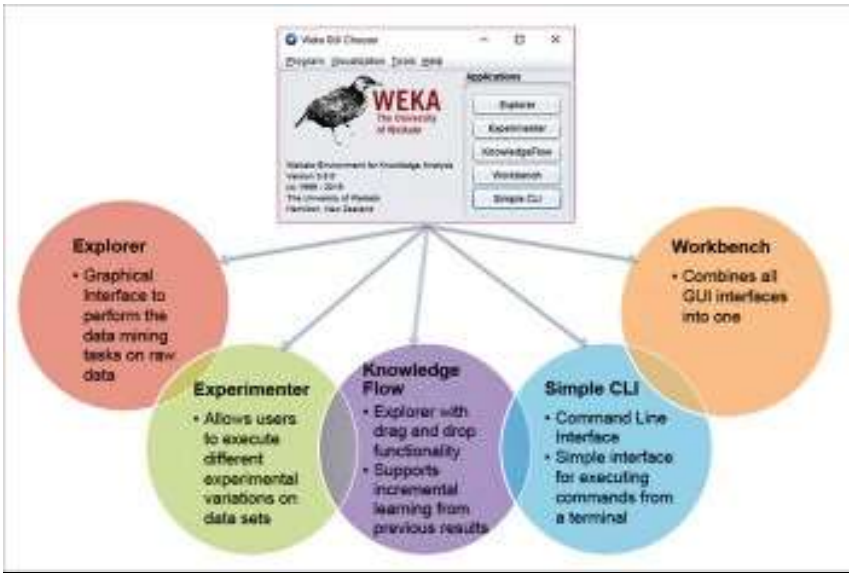
Data Mining Tool we have used is the **Weka Data MiningTool.**

Weka

Weka is data mining software that uses a collection of machine learning algorithms. These algorithms can be applied directly to the data or called from the Java code. Weka is a collection of tools for:

- *Regression*
- *Clustering*
- *Association*
- *Data pre-processing*
- *Classification*
- *Visualization*

The features of Weka are shown in Figure 1.



Data Mining And Genetic Algorithm

Genetic algorithm A genetic algorithm (GA) is a search technique used in computing to find exact or approximate solution to optimization and search problems. Genetic algorithms are categories as global search heuristics. Genetic algorithms are a probabilistic search and evolutionary optimization approach. Genetic algorithms are inspired by Darwin's theory about evolution. Solution to a problem solved by genetic algorithms is evolved. Algorithm is started with a set of solutions (represented by chromosomes) called population. Solutions from one population are taken and used to form a new population. This is motivated by a hope, that the new population will be better than the old one. Solutions which are selected to form new solutions (offspring) are selected according to their fitness - the more suitable they are the more chances they have to reproduce. This is repeated until some condition (for example number of populations or improvement of the best solution) is satisfied.

1. [Start] Generate random population of n chromosomes (suitable solutions for the problem)
2. [Fitness] Evaluate the fitness f(x) of each chromosome x in the population
3. [New population] Create a new population by repeating following steps until the new population is complete

1. [Selection] Select two parent chromosomes from a population according to their fitness (the better fitness, the bigger chance to be selected)
2. [Crossover] With a crossover probability cross over the parents to form a new offspring (children). If no crossover was performed, offspring is an exact copy of parents.
3. [Mutation] With a mutation probability mutate new offspring at each locus (position in chromosome).
4. [Accepting] Place new offspring in a new population
4. [Replace] Use new generated population for a further run of algorithm
5. [Test] If the end condition is satisfied, stop, and return the best solution in current population
6. [Loop] Go to step 2
a) Genetic Algorithms and Classification
The construction of a classifier requires some parameters for each pair of attribute value where one attribute is the class attribute and another attribute is selected by the analyst. These parameters may be used as intermediate result for constructing the classifier. Yet, the class attribute and rest all attributes that analyst considers as relevant attributes must be the attributes of the tables that might be used for

analysis in future. Hence, attribute values of class attribute are always frequent. When pre-computing the frequencies of pairs of frequent attribute values, the set of computed frequencies should also include the frequencies that a potential application needs as values of the class attribute and relevant attribute are typically frequent. A framework for Genetic Algorithm to be implemented for Classification is

1. Start
2. Initialize the Population
3. Initialize the program size
4. Define the fitness fi of an individual program corresponds to the number of hits and is evaluated by specific formula:
5. Run a tournament to compare four programs randomly out of the population of programs
6. Compare them and pick two winners and two losers based on fitness
7. a) Copy the two winners and replace the losers
b) With Crossover frequency, crossover the copies of the winners
c) With Mutation frequency, mutate the one of the programs resulting from performing step
d) With Mutation frequency, mutate the other of the programs resulting from performing step 7(a)
8. Repeat through step 5 till termination criteria are matched

Table 1: Parameters associated with Women's Health Of Chhattisgarh

Parameters	*Weightage*	*Values*
Female	Age 13 – 17 18 – 28	0.9 0.3 0.3
Smoking	Never Past Current	0.1 0.3 0.6
Overweight	Yes No	0.8 0.1
Alcohol Intake	Never Past Current	0.1 0.3 0.6
High Salt Diet	Yes No	0.9 0.1
High Saturated Fat Diet	Yes No	0.9 0.1
Exercise	Never Regular High if age <30 High if age >50	0.6 0.1 0.1
Sedentary lifestyle/ina	Yes No	0.7 0.1

Hereditary	Yes No	0.7 0.1
Bad Cholesterol	Very high(>200) High(160 to 200) Normal (<160)	0.9 0.8
Blood Pressure	Normal(130/89) Low(<119/79) High(>200/160)	0.1 0.8 0.9
Blood Sugar	High(>120 & <400) Normal(>90 & <120) Low(<90)	0.5 0.1 0.4
Heart Rate	Low(<60 bpm) Normal(60 to 100) High(>100 bpm)	0.9 0.1
Hemoglobin	Low(<11.2) Normal(11.2 to 15.7) High(>15.7)	0.9 0.1 0.8
Working Condition	Homemaker working in stress Homemaker working in non stress Working outside in polluted environment Working outside in non – polluted environment	0.9 0.1 0.9 0.5

5. CONCLUSION

The above research work is done, so that it can be used by the primary health center and it can reach those people who are geographically quite far, from the main area. Compared to other parts of India, Chhattisgarh Women play a significant role in running whether they are women living in villages or women living in Urban cities. They work as farmers in fields, some of them work in Industries.

Chhattisgarh is very rich in mining so there are lot of Industries harmful chemicals. And at the same Chhattisgarh women who lives in remote villages who get married quiet early and there is no limit of there giving birth to children. All this things creates a very dangerous situation in connection to their health as well as the health of their children's. This paper is written in connection to making them aware about the condition of their health and its future implications. This research work will give them guidance in connection to the kind of food they should take, the medicines they should take and the improvement which they should make in their daily habits, so that they can save themselves as well as their children

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