TO DETERMINE THE HEALTH STATUS OF THE MOTHER

Dr.M.Rajeswari
Assistant Professor
Department of B.Com Business Analytics
PSGR Krishnammal College for Women, Coimbatore, India
rajeshwarim@psgrkcw.ac.in

S.D.Bhavatharani[2],
UG Scholar,
Department of B.Com(Business Analytics),
PSGR Krishnammal College for Women, Coimbatore, India.
bhavatharanidhanabal2001@gmail.com

ABSTRACT:

A healthy pregnancy leads to a healthy birth. Therefore, early and routine fetal care improves the chances of a healthy pregnancy. Fetal fitness care is a manner of looking after a pregnant mother at some stage in the maternity cycle. Each pregnant woman needs to realize the impact of being pregnant. So level of risk before, during and after childbirth to the safety of mother and child can be prevented by proper care of mother's status. This objective is to determine the health status of the mother. In this objective, application is used as a tool to collect the data related to the users. With that data, the health status of the mother was analyzed with decision tree algorithm.

Keywords: maternal health, fetal health, malnutrition, decision tree

I.INTRODUCTION

Pregnancy is the period where there is a change for a mother requiring a lot of care during this period the fetus is developed directly by the mother through placenta. Around 800 women die each day because of being pregnant and childbirth-associated problems. Maternal health and fetal health are closely linked as about 3 million newborn babies die each year due to lack of healthcare. During the gestation period a mother needs nutrition to meet the requirement of growing fetus. The fetal growth is associated with pregnancy therefore proper diet is necessary to ensure energy intake for proper growth of fetus without drawing on mother's own to maintain her pregnancy. In pregnancy, there is 50 percent chance resulting in a low birth weight. The Decision tree algorithm is used to categorize or make predictions based totally on how a preceding set of questions are answered. The dataset has obtained via maternal questionnaire and special evaluations of web application. In this objective, clinical history of the mother is taken as inputs and the algorithm is used to measure the accuracy of healthy mother as an output.

Objective:

1. To determine the health status of the mother.
2. To predict the accuracy rate of health status of the mother.

II.RELATED WORKS

Filippova RD, Stepanova NR, Nikiforova ,covers the study of the structure of extra genital pathology in pregnant women based on the data obtained at the clinic of the perinatal center of the State Organization of the Ministry of Health of the Sakha Republic National Center of Medicine - Republican Hospital No. 1 in 2013. The presence of extra genital conditions in pregnant women are the major factors in the high risk of maternal mortality.[4]

Bhowmik, Pankaj & Bhowmik, Pulak & Ali, U A Md Ehsan & Sohrawordi, used the details of sizeable number of women face difficulties during pregnancy, which eventually can lead the serious fetal

health problems. However, early detection of these risks can save both the life of infants and mothers. Medical diagnosis and prediction is a topic that is basically related with e-Health and machine learning.[2]

Federenko IS, Wadhwa PD speaks that women's mental health during pregnancy has importance not only for the well-being of the mother, but also for the unborn child. Some women have health issues that arise during pregnancy, and other women have health problems before they become pregnant that could lead to complications during pregnancy. It is very important for women to receive health care before, during and even after pregnancy to decrease the risk of pregnancy complications.[5]

Sengan, Sudhakar tells that health complications during the pregnancy have evolved as a global issue. Those complications may result in the high mortality of the fetus. The genesis of machine learning(ML) algorithms in the healthcare has brought progress in disease diagnosis, treatment, and prognosis. The regression analysis and correlation analysis has been the influence of the attributes on fetal health. The results of the algorithms show that RF performs better in terms of accuracy, precision, recall, F1-score, and support.[10]

A healthy pregnancy gives to a healthy birth. So periodic fetal care increase the chances of a healthy pregnancy. Each pregnant woman should know everything that effects pregnancy outcome. So there should be a proper care including the predication of risks level before, during and after the delivery for the safety of both mother and child.[3]

In attempting to conceive and those in early pregnancy should alter their lifestyles to achieve a healthy pregnancy. This study aims to determine women's report of health behaviors during pregnancy to identify 'at risk' groups of women and their risk pregnancy outcomes. Women were more likely to engage in healthy lifestyle behaviors during the third trimester when they have their first baby. Pregnant women with healthy lifestyles during pregnancy had better perinatal outcomes than unhealthy women. [7]

Lagadec, N., Steinecker, M., even in uncomplicated pregnancies, these changes that can affect the quality of life of pregnant women. The objective is to describe the quality of life during uncomplicated pregnancy and to assess its associated physical and psychological factors in developed countries. Health professionals in the field of maternal and child health care try to satisfy their patients with respect to their experience during pregnancy periods. they are not sufficient on their own because population health should be assessed.[9]

Congenital anomalies are seen at 3% of the population, probabilities of which are tried to be found out primarily through tests during pregnancy. Also, ultrasonographical evaluations of fetuses enhance detecting these abnormalities. About 70% of the anomalies can be diagnosed via ultrasonography, while the remaining 30% can be found after childbirth. To help clinicians and families to better predict fetal congenital anomalies besides the pregnancy tests using machine learning techniques and e-Health applications.[1]

The risk parameters were declared according to a survey done with experts and world health standards. Artificial Neural Network (ANN) and Naïve Bayes (NB) algorithms were used to predict the risk level separately and a hybrid algorithm was used to improve the accuracy level of the prediction.[8] Deficiencies of nutrients can affect growth and development of the fetal.

Fetal improvement is a useful indicator of fetus health. Inconsistent fetal movement is a major reason of fetal death. So it must be found out early to encourage fetal health state. The proposed system is aimed at designing a model using associative classification technique to analyze fetal movement to enhance the quality of result for pregnant females with reducing fetal movement.[6]

# III.METHODOLOGY
WORK FLOW
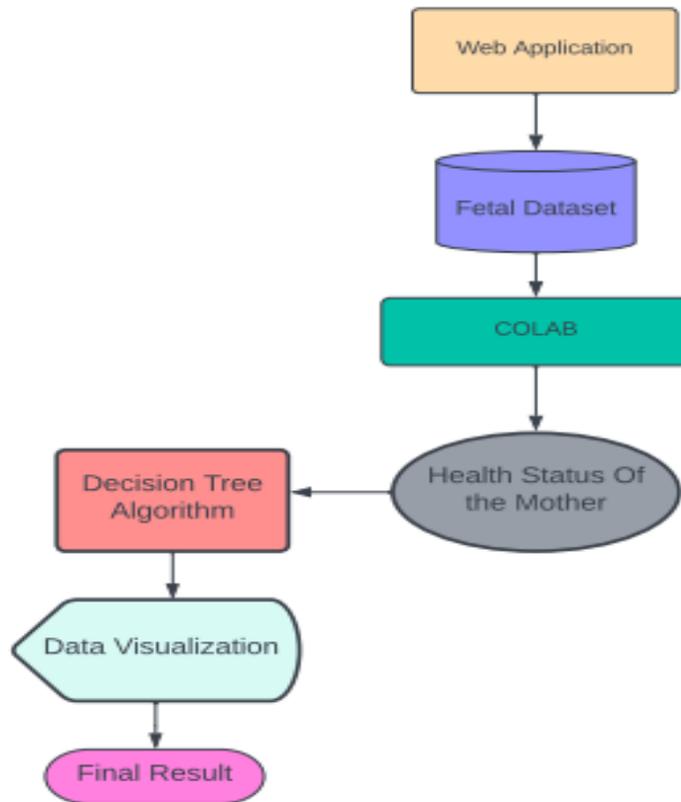
DECISION TREE:

The decision tree algorithm makes use of a tree-like structure of choices to show their possible consequences.

STEP 1: The records of health status of the mother which was obtained through maternal questionnaire and detailed evaluations are collected from the web application.

STEP 2: The attributes for the decision tree i.e. Age, BP, Diabetes level, Cholesterol level and maternal age is fitted inside the decision tree and then the decision tree is plotted.
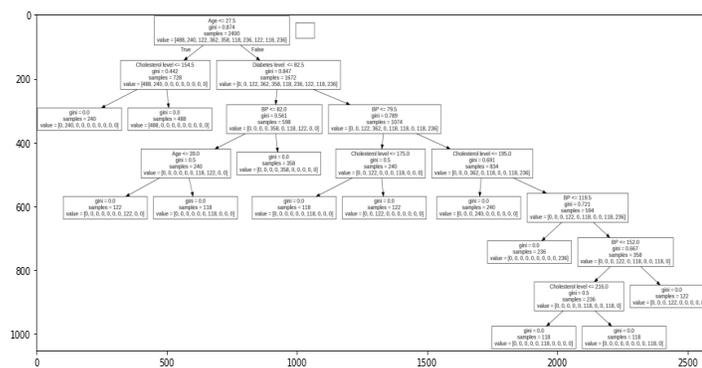
- The number of abortions for each pregnant women and the number of mothers with health issues are gathered from the survey in web application.
- A Scatterplot is used to show the connection among two quantitative variables plotted along axes.
- In this review, each dot shows the name of the mother versus the number of abortions.
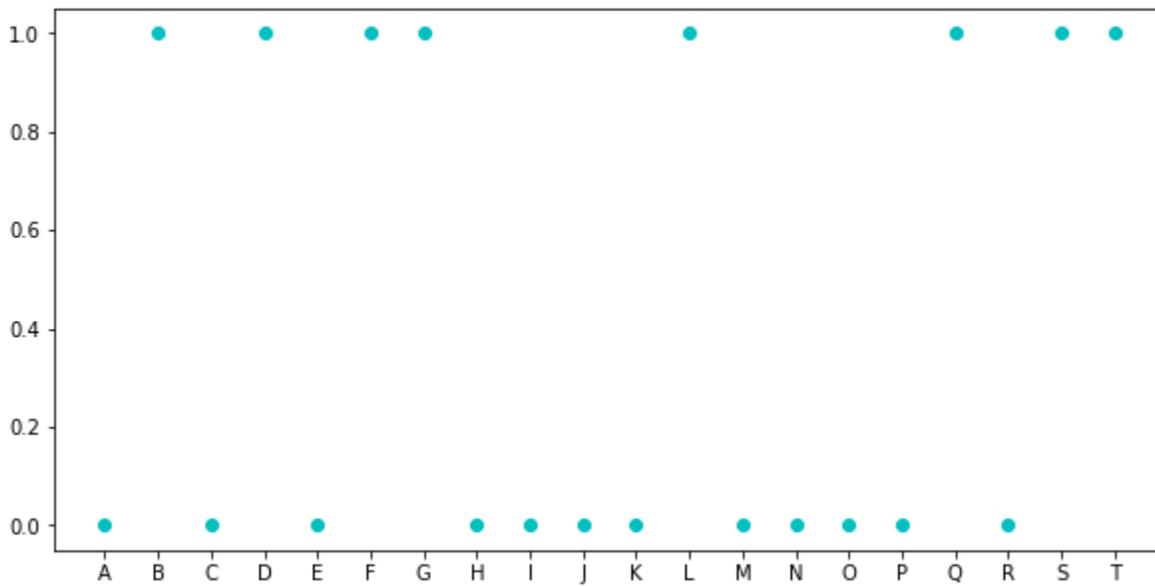
- Bar graphs are perfect for evaluating one or more values over time. They deliver discrete values of an object within a category. In this evaluation,
- The bar graph displays the name of the mother and mothers with to health issues i.e. diabetes and BP.
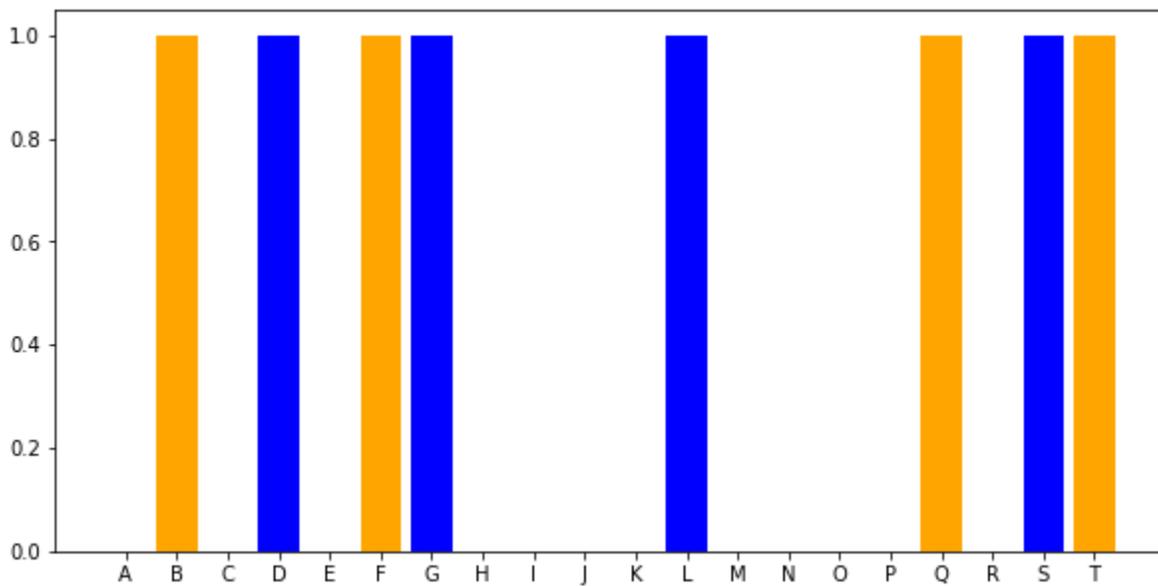
IV.EVALUATION

- The prediction is performed that analyses the dataset of pregnant women along with their clinical history and statistics, and gives a end result based on the skilled dataset.
- For measuring the accuracy of our decision tree model, the dataset is split into training and test set. Based on the overall performance, the accuracy of the data is obtained.

```
# Measuring the accuracy of our model.
from sklearn.metrics import accuracy_score
print(accuracy_score(y_test, y_pred))

0.7466666666666667
```

- In this paper, the highest accuracy of prediction is displayed as 74..67% during the development tests with Decision tree algorithm.

V.CONCLUSION AND FURTHER WORKS

For prediction, the facts of the surveys are imported. The fetal health status changed into expected dataset and the output turned into acquired. In this paper, the health status of the mother is identified by analyzing her past health conditions like BP, Diabetes, etc. Thus, the result is that some women are healthy and some are unhealthy, those with unhealthy conditions are to take good care of themselves during their pregnancy.

REFERENCES:

[1] Akbulut A, Ertugrul E, Topcu V. Fetal health status prediction based on maternal clinical history using machine learning techniques. Comput Methods Programs Biomed. 2018 Sep;163:87-100. doi: 10.1016/j.cmpb.2018.06.010. Epub 2018 Jun 14. PMID: 30119860.

[2] Bhowmik, Pankaj & Bhowmik, Pulak & Ali, U A Md Ehsan & Sohrawordi, Md. 2021. "Cardiotocography Data Analysis to Predict Fetal Health Risks with Tree-Based Ensemble Learning". International Journal of Information Technology and Computer Science. 13. 30-40. 10.5815/ijitcs.2021.05.03.

[3] BOOK, Piri, Jayashree, Mohapatra, Puspanjali , 2019/12/01,166,171," Exploring Fetal Health Status Using an Association Based Classification Approach" 10.1109/ICIT48102.2019.00036.

[4] Filippova RD, Stepanova NR, Nikiforova VN. HEALTH STATUS OF PREGNANT WOMEN. Wiad Lek. 2015;68(4):596-7. PMID: 26887145.

[5] Federenko IS, Wadhwa PD. 2004 Mar "Women's mental health during pregnancy influences fetal and infant developmental and health outcomes". CNS Spectr. ;9(3):198-206. doi: 10.1017/s1092852900008993. PMID: 14999160.

[6] Jonathan Lai,Niamh C Nowlan,Ravi Vaidyanthan,Caroline J.Shaw, and Christoph C. Lees, Acta Obstet Gynecol Scand. 2016 Sep; 95(9): 968–975. Published online 2016 Aug 16. doi: 10.1111/aogs.12944. PMCID: PMC6680271, PMID: 27374723.

[7] JOUR, Dunney, Clare, Murphy, Deirdre/2015/12/02, 884," Healthy lifestyle behaviours in pregnancy: : A prospective cohort study in Ireland" 23, 10.12968/bjom.2015.23.12.874 , British Journal of Midwifery.

[8] JOUR, Saritas, Mücahid, YASAR, Ali, PY - 2019/01/01," Performance Analysis of ANN and Naive Bayes Classification Algorithm for Data Classification" 7, International Journal of Intelligent Systems and Applications.

[9] Lagadec, N., Steinecker, M., Kapassi, A. *et al.* Factors influencing the quality of life of pregnant women: a systematic review. *BMC Pregnancy Childbirth* **18,** 455 (2018). https://doi.org/10.1186/s12884-018-2087-4

[10] Sengan, Sudhakar, - Mehbodniya, Abolfazl, Lazar,Arokia,Webber,Julian,Sharma,Dilip 2021/12/01" Fetal health classification from cardiotocographic data using machine learning". 10.1111/exsy.12899 /   Expert systems.