

DIABETIC MELLITUS PREDICTION USING **IBM AUTOAI**

1.INTRODUCTION

The purpose of this project is to understand the insights of machine learning and Building the model for prediction of Diabetic Mellitus is useful in Medical Industry.Model identifies trends and patterns.Using the model no human Intervention is needed.Machine learning makes it easy to handle multi-dimensional and multi-variety data and the web application built can be used by everyone.

1.1 Overview

Diabetes mellitus or simply diabetes is a disease caused due to the increase level of blood glucose. Various traditional methods, based on physical and chemical tests, are available for diagnosing diabetes. Early prediction of diabetes is quite challenging task for medical practitioners due to complex interdependence on various factors as diabetes affects human organs such as kidney, eye, heart, nerves, foot etc

1.2 Purpose

The purpose of this project is to predict the Diabetic Mellitus using IBM Watson Studio. The purpose of this project is to learn about Machine Learning and the facilities available in IBM cloud and explore its wide range of services. The IBM Cloud includes Infrastructure as a service, Software as a service and Platform as a service. IBM offers tools for cloud-based collaboration, development and test, application development, analytics, business-to-business integration, and security.

2. LITERATURE SURVEY

2.1 Existing Problem

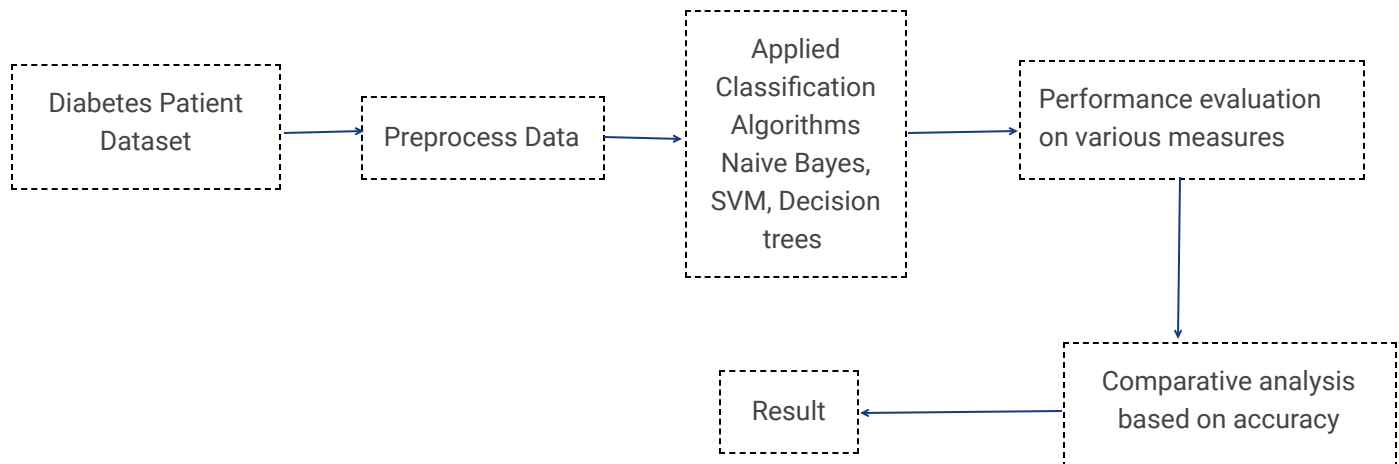
Diabetes mellitus is a chronic disease characterized by hyperglycemia. It may cause many complications. According to the growing morbidity in recent years, in 2040, the world's diabetic patients will reach 642 million, which means that one of the ten adults in the future is suffering from diabetes. There is no doubt that this alarming figure needs great attention. With the rapid development of machine learning, machine learning has been applied to many aspects of medical health for accurate predictions.

2.2 Proposed Solution

This project prevents the people from the avalanche by priory informing them there is a chance to the occurrence of avalanche or not. The model gets the data from the IOT based sensors. After that we want to process those data using a suitable algorithm, then our model display whether the avalanche occur or not and how strength it was. To analyse the data coming from different sensors we are applying various machine learning algorithms. If there is a chance of avalanche then the notification will be sent to people so that they can take decisions accordingly and the model is been built in Auto AI.

3. THEORITICAL ANALYSIS

3.1 Block Diagram



3.2 Hardware/Software designing

Project requirements

1. A classification algorithm with maximum accuracy to be trained and tested on the dataset.
2. The dataset consisting of 8 columns excluding the predicting column i.e. class.

4. EXPERIMENTAL INVESTIGATION

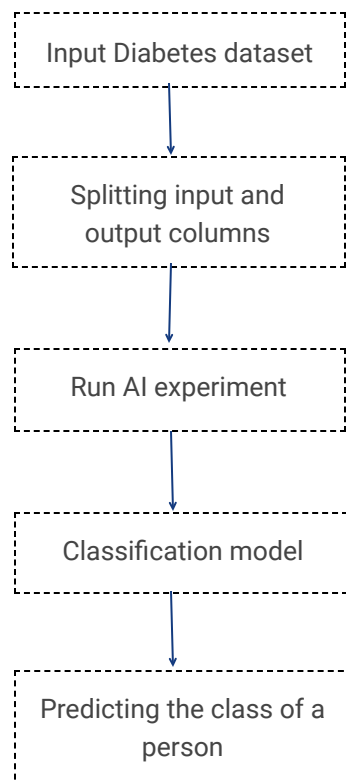
- **Choose a project idea**
Predicting Diabetic Mellitus of a person using AutoAI.
- **Conduct Background research**
<https://www.kaggle.com/akhilalexander/diabeticprediction>
- **Compose a hypothesis**
Based on our study and information gathered we can predict whether a person has diabetes or not.
- **Design your experiment**
First we need to collect the suitable dataset for our problem

statement. Next we need to run the AutoAI experiment for this problem and use the algorithm which has the highest accuracy.

- ***Draw conclusions***

After building our model, we can predict the class of a person(i.e.0 or 1).

5. FLOW CHART



6. RESULT

IBM Watson AutoAI Experiment

The screenshot displays the IBM Watson Studio interface. The top navigation bar includes the IBM Watson Studio logo, an Upgrade button, a notification bell, and the user's account information (Lauren Jain's Account). The breadcrumb trail shows the path: My projects / DiabeticMellitus / DIAB - P4 XGBClassifierEstimator / Bianryclassifier. The main content area is divided into three tabs: Overview, Implementation, and Test. The Test tab is active, showing an 'Enter input data' section on the left with input fields for 'mass' (30.5), 'pedi' (0.158), and 'age' (53). A 'Predict' button is located below these fields. On the right, a large text area displays the JSON output of the prediction:

```
{  "predictions": [    {      "fields": [        "prediction",        "probability"      ],      "values": [        [          1,          [            0.20813214778900146,            0.7918678522109985          ]        ]      ]    }  ],  }
```

Node RED Application

The screenshot shows a Node RED application interface. The top bar is blue and labeled 'Home'. The main workspace is light gray. A central panel titled 'Diabetic Mellitus Prediction' contains a form with input fields for 'preg' (2), 'plas' (197), 'pres' (70), 'Skin' (45), 'test' (543), 'mass' (30.5), 'pedi' (0.158), and 'age' (53). Below the form are 'SUBMIT' and 'CANCEL' buttons. At the bottom of the panel, the text 'Class 1' is displayed.

7. ADVANTAGES AND DISADVANTAGES

Advantages

1. This project prevents the people from the avalanche by priority informing them there is a chance to the occurrence of avalanche or not.
2. The earlier diagnosis is obtained, the much easier we can control it
3. Machine learning can help people make a preliminary judgment about diabetes mellitus according to their daily physical examination data, and it can serve as a reference for doctors.
4. The advantage of using AutoAI is we don't need to write the code we just have to give dataset as input, it automatically builds the model using AutoAI pipeline and gives the model with highest accuracy.

Disadvantages

1. **Deterministic problems:** This method is not very efficient for deterministic problems.
2. **Lack of good data:** it may lead to problems.

8. APPLICATIONS

1. The application is used to predict diabetes for users.
2. This system can serve as a reference for doctors.

9. CONCLUSION

Diabetes mellitus is a disease, which can cause many complications. How to exactly predict and diagnose this disease by using machine learning is worthy studying. The end product is an webpage created and deployed on node-red app of IBM cloud. The backend of webpage is XGBoost Classifier built in AutoAI with 0.770 accuracy and deployed on Watson studio using machine learning service.

The web page has input fields such as Preg, Plas, Pres, Skin, Test Mass, Pedi, Age and an output field named as Class which gives 0 or 1 based on the input values.

10. FUTURE SCOPE

Living with diabetes is challenging and distressful. Diabetic patient's condition cannot be understood only from his with medical charts. There is a need to collect and analyze both subjective and objective patient information in order to fully understand the occurrence of readmission of patients with diabetes. This predicting information might improve the intelligent models to identify patients at high risk of readmission.

11. BIBLIOGRAPHY

- https://www.researchgate.net/publication/328766758_Predicting_Diabetes_Mellitus_With_Machine_Learning_Techniques
- [https://en.wikipedia.org/wiki/Diabetes#:~:text=Diabetes%20mellitus%20\(DM\)%2C%20commonly,increased%20thirst%2C%20and%20increased%20appetite.](https://en.wikipedia.org/wiki/Diabetes#:~:text=Diabetes%20mellitus%20(DM)%2C%20commonly,increased%20thirst%2C%20and%20increased%20appetite.)
- <https://node-red-umfhq-2020-08-09.eu-gb.mybluemix.net/ui/#!/0?socketid=Na68NlxwjI5RtrTdAAAB>

12. APPENDIX

● Source Code

```
[{"id":"e811bc1.c02ce4","type":"ui_form","z":"a82fdc2a.45b35","name":"","label":"","group":"5d1bd882.8a9a28","order":1,"width":0,"height":0,"options":[{"label":"preg","value":"pr","type":"number","required":true,"rows":null},{"label":"plas","value":"pl","type":"number","required":true,"rows":null},{"label":"pres","value":"pre",
```

```

"type":"number","required":true,"rows":null},{
"label":"Skin","value":"sk","type":"number",
"required":true,"rows":null},{
"label":"test","value":"tst","type":"number",
"required":true,"rows":null},{
"label":"mass","value":"ms","type":"number",
"required":true,"rows":null},{
"label":"pedi","value":"pe","type":"number",
"required":true,"rows":null},{
"label":"age","value":"a","type":"number",
"required":true,"rows":null}],
"formValue":{"pr":"","pl":"","pre":"","sk":"","tst":"","ms":"","pe":"","a":""},
"payload":"","submit":"submit","cancel":"cancel",
"topic":"","x":71,"y":482.9999952316284,
"wires":[["20b671e2.0c18ce"]]},
{"id":"5d1bd882.8a9a28","type":"ui_group","z":"","name":"Diabetic Mellitus Prediction",
"tab":"8d3ba6f0.9275f8","order":1,"disp":true,"width":"6","collapse":false},
{"id":"8d3ba6f0.9275f8","type":"ui_tab","z":"","name":"Home","icon":"dashboard",
"disabled":false,"hidden":false}]

```

- **UI Output**

Home

Diabetic Mellitus Prediction

preg *
2

plas *
197

pres *
70

Skin *
45

test *
543

mass *
30.5

pedi *
0.158

age *
53

SUBMIT CANCEL

Class 1

BY-

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