



Diabetic Mellitus Prediction using IBM AutoAI

A

Internship Project Report

By

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INDEX

1. Acknowledgement

2. Introduction

2.1 Overview

2.2 Purpose

3. Literature survey

3.1 Existing Problem

3.2 Proposed Solution

4.Theoritical Analysis

4.1 Block Diagram

4.2 Hardware/Software designing

5. Experimental investigation

6. Flow chart

7. Result

8. Advantages & disadvantages

9. Application

10. Conclusion

11. Future Scope

12.Biblography

13.Appendix

13.1 Source Code

13.2 UI output Screenshots

1. ACKNOWLEDGEMENT

The internship opportunity I had with SMART INTERNZ was a great chance for learning the professional development skills for my career.

Therefore, I am thankful as I am provided with an opportunity to use the time during this pandemic also to be a part of Remote Internship program and learn a lot from it. I am also grateful for having a chance to acquire knowledge from many wonderful people and professionals who led me through this internship period.

A special thanks to the this platform inspite of being extraordinarily busy with their duties,they provide time to guide and train me for the correct path & allowing me to carry out my project at their esteemed organization.

I express my deepest thanks to Mr.Ram Mohan Bethi for giving necessary advices ,support and guidance and arranged all facilities to make professional life easier. I choose this moment to acknowledge his contribution gratefully.

2.Introduction

Diabetes is a common chronic disease and poses a great threat to human health. The characteristic of diabetes is that the blood glucose is higher than the normal level impaired biological effects, or both.

2.1 Overview-

Diabetes can lead to chronic damage and dysfunction of various tissues, especially eyes, kidneys, heart, blood vessels and nerves

Diabetes can be divided into two categories, type 1 diabetes (T1D) and type 2 diabetes (T2D). Patients with type 1 diabetes are normally younger, mostly less than 30 years old. The typical clinical symptoms are increased thirst and frequent urination, high blood glucose level. This type of diabetes cannot be cured effectively with oral medications alone and the patients are required insulin therapy. Type 2 diabetes occurs more commonly in middle-aged and elderly people, which is often associated with the occurrence of obesity, hypertension, dyslipidemia, arteriosclerosis, and other diseases .

2.2 Purpose

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

.

Recently, numerous algorithms are used to predict diabetes, including the traditional machine learning method such as support vector machine (SVM), decision tree (DT), logistic regression and so on.

Machine learning methods are widely used in predicting diabetes, and they get preferable results. Decision tree is one of popular machine learning methods in medical field, which has grateful classification power. Random forest generates many decision trees.

The purpose of this project is that using IBM cloud which provide machine learning services and others so that without coding we can run the model and predict the results.

Accurately and Fastly diagnose the Diabetes.

3.Literature survey

A study was conducted to identify the prevalence of diabetes mellitus and the number of people affected with diabetes mellitus between the year 2000 and 2030.

Prevalence of diabetes with regard to age and sex were estimated from 191 WHO states including US. In developing countries, people from urban area and rural area were separately taken for the study.

Globally, people with diabetes mellitus were 2.8% in 2000 in all age groups. Whereas the prevalence diabetes mellitus is expected to increase at 4.4% by the year 2030 among all age groups. There were 171 million of patients with diabetes mellitus in 2000 and it is expected to raise the peak rate of 366 million by the year 2030. With regard to sex, men had higher prevalence of diabetes than women, but women with diabetes were higher than men. The results revealed that in developing countries, the urban people with diabetes were expected to double the number from 2000 to 2030. Further obese people had high prevalence of diabetes than non-obese people. So, obesity is one of the dangerous risk factors for diabetes mellitus.

3.1 Existing Problem

With the development of living standards, diabetes is increasingly common in people's daily life. Therefore, how to quickly and accurately diagnose and analyze diabetes is a topic worthy studying.

3.2 Proposed Solution

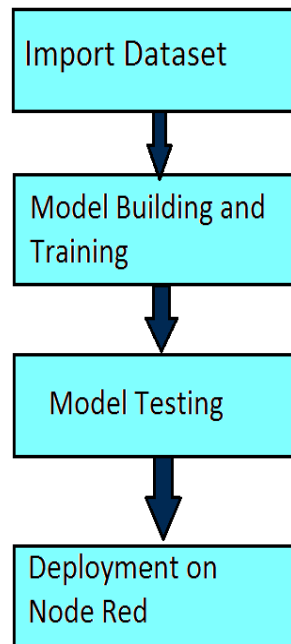
Diabetic Mellitus Prediction using Auto AI project consist a Machine Learning model to predict the disease using IBM Watson Auto AI Machine Learning Service. The model is deployed on IBM cloud to urge the value which might be used as API in mobile app or web app building. Here, we are going to be developing an internet application which is constructed using node red service.

We make use of the various user input values to the deployed model. The model prediction is then showcased on interface.

This project examines the appliance of machine learning algorithms to predict cost in effective manner. Machine learning techniques are often utilized in various areas to predict different values prediction.

4.Theoritical Analysis

4.1 Block Diagram



4.2 Software Design: -

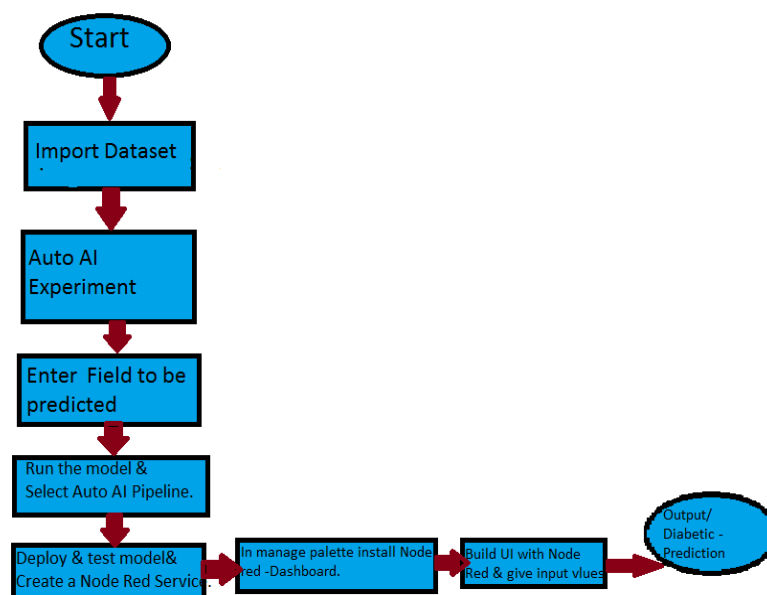
The project model is developed on IBM Cloud's AutoAI Experiment under Watson Studio in which data is given as a csv file and one has to chose which column it should predict then it automatically chooses the algorithm according to the data given and expected output. This model is then deployed on Node red.

5. Experimental investigation

1. Create a project in Watson Studio.
2. Auto AI Experiment created in add projects
3. Import Datset.
4. Run the model.
5. Selection o Auto AI Pipeline.
6. Deploy and test model
7. Create a Node Red Service.
8. In manage palette install Node red -Dashboard.
9. Build UI with Node red.

We give input values and get Diabetic prediction that a person is diabetic or not.

6. Flow Chart-



7. Result :-

After the implementation of the project the UI predicts at what age he or she can get effected. The Node Red UI provide us simple way to get the result of Auto AI Experiment. The Node Red User Interface can be a web application help the people to be aware of the health situation .Here is the Node Red UI which predicts classification.

8. Advantages and Disadvantages: -

8.1. Advantages: -

- The Model can be used in many healthcare facilities to predict the possibilities of diabetes
- The model can also be used for screening purpose.
- It can be available and accessed remotely.

8.2. Disadvantages: -

- This model can not tell if it is type 1 or type 2 Diabetes.
- Model can not tell how it could be prevented.

9. Applications: -

- It Can be used in healthcare facilities.
- It will be a great option for screening purpose.
- This model is available remotely and can be accessed

anywhere.

- We all have been using GPS navigation services. While we do that, our current locations answer is machine learning

10. Conclusion : -

These days, machine learning techniques are being widely used to solve healthcare problems. IBM Watson's AutoAI is a great tool in manipulating pipeline modelling to automatically select algorithms on the given data with greater accuracy. The autoAI experiment applied XBG Classifier and Gradient Boosting Classifier with various enhancements and Gradient Boosting Classifier got the maximum accuracy after several enhancements.

11.Future Scope: -

The approach which we used in this group has some limitations. Though we can predict the chances of Diabetes with an high accuracy but in future it has to be included the type of the Diabetes that is found in ones body. Also, we can include several features so that the model can predict the effectiveness of the disease and can recommend actions that one should take.

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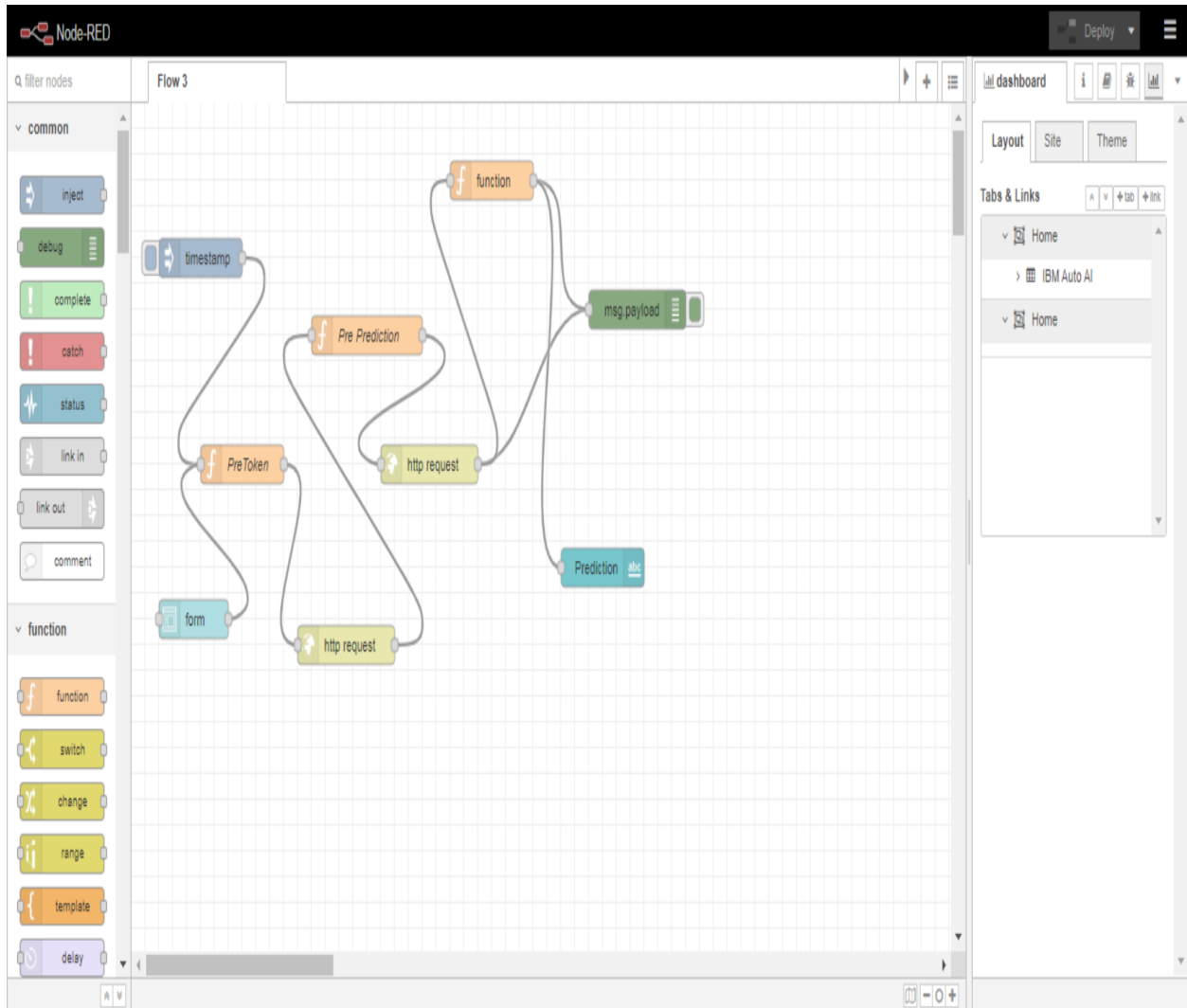
13. Appendix

Link for ui-<https://node-red-bpwqk-2020-07-31.eu-gb.mybluemix.net/ui>

13.1 Source code

Note-UI sourcecodeUploaded as separate notepad file on Github

13.2 UI output Screenshots



IBM Auto AI

Prediction 0

Preg⁺
45

Plas⁺
15

Pres⁺
10

Skin⁺
2

Test⁺
0

Mass⁺
25

Pedi⁺
7

Age⁺
45

SUBMIT

CANCEL