A PROJECT REPORT ON

Diabetic Mellitus Prediction using IBM Auto AI

RSIP Career Basic ML 205

Project Id : S_PRO_289

J. Sahith Reddy

sahithreddy639@gmail.com

Index

1. INTRODUCTION

1.1 Overview
1.2 Purpose

2. LITERATURE SURVEY

2.1 Existingproblem
2.2 Proposedsolution

3. THEORETICAL ANALYSIS

3.1 Blockdiagram
3.2 Hardware/Softwaredesigning

4. EXPERIMENTAL INVESTIGATION

5. FLOWCHART

6. RESULT

7. ADVANTAGES & DISADVANTAGES

8. APPLICATION

9. CONCLUSION

10.FUTURE SCOPE

1.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, which is caused by defective insulin secretion or its impaired biological effects, or both. 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 levels. 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.

1.1 OVERVIEW

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.

1.2 PURPOSE

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.

This project prevents the people from the avalanche by priory informing them there is a chance to the occurrence of avalanche or not.In medicine, the diagnosis of diabetes is according to fasting blood glucose, glucose tolerance, and random blood glucose levels. The earlier diagnosis is obtained, the much easier we can control it. 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.

This project prevents the people from the avalanche by priory informing them there is a chance to the occurrence of avalanche or not.In medicine, the diagnosis of diabetes is according to fasting blood glucose, glucose tolerance, and random blood glucose levels. The earlier diagnosis is obtained, the much easier we can control it. 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.

2.LITERATURE SURVEY

2.1 EXISTING PROBLEM

Diabetes mellitus or simply diabetes is a disease caused due to the increase level of blood glucose. Various traditional methods, based on physical and

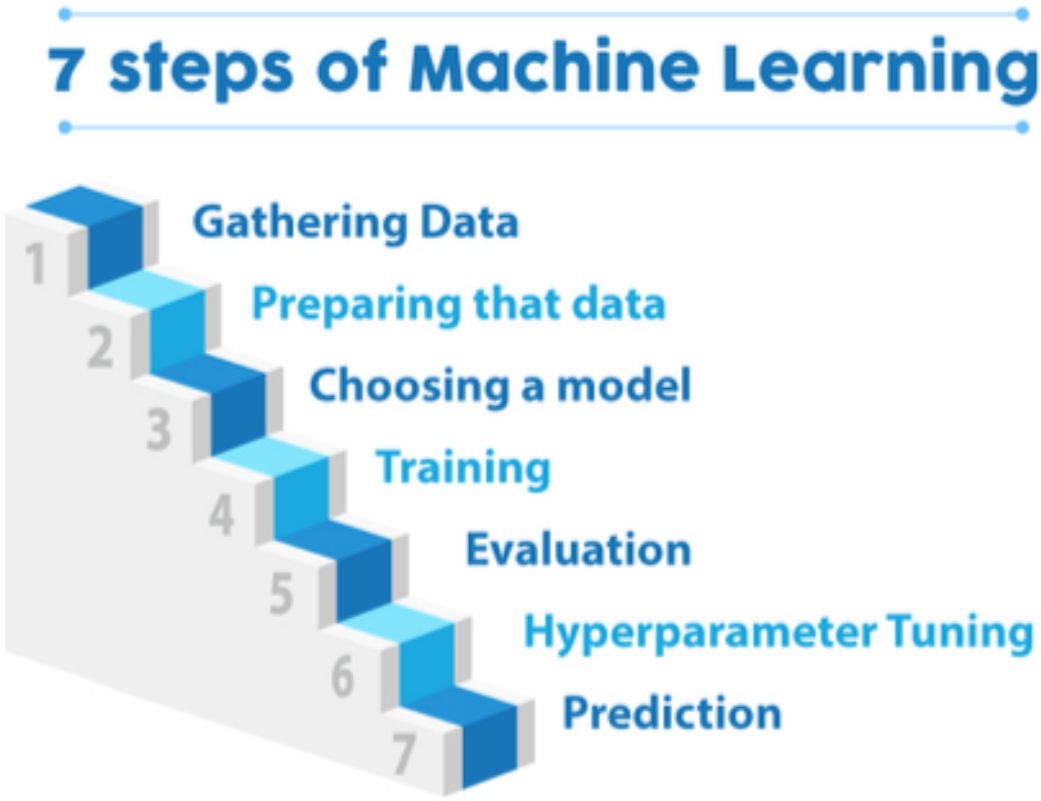
chemical tests, are available for diagnosing diabetes. Early prediction of diabetes is quite challenging task for medical practitioners due to complex interdependence on various factors as diabetes affects human organs such as kidney, eye, heart, nerves, foot etc

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 aim of this project is to develop a system which can perform early prediction of diabetes for a patient with a higher accuracy by combining the results of different machine learning techniques and the model is been built in Auto AI.

THEORETICAL ANALYSIS

The **block diagram** of machine learning :



In Machine Learning according to these steps machine can predict the result also one more benefit is that when a large data is present, its not possible for a human to

analysis the huge data. So, its preferable that a machine uses algorithms to analysis these data and predict the future data which can help in different ways.

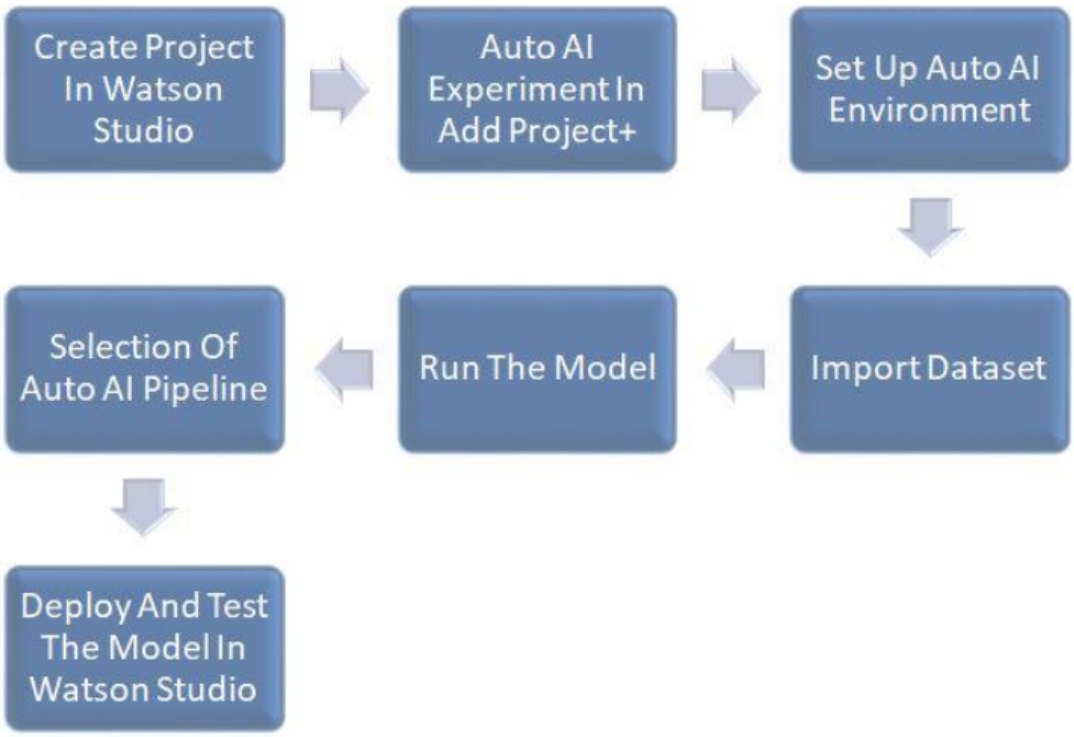
The project uses Watson Auto AI Experiment Service. The project used XGB Classifier Algorithm to predict grades and have build me 00:00:04 . Watson Studio Auto AI Experiment implements 8 different pipeline and uses the best one. Also, a cloud object storage service needed to store the dataset and machine learning service instance. Node Red App service is required to get authencation easily and get predicted grade on Node Red Dashboard or building UI Application.

Hardware / Software Designing

This project can be implemented using IBM Cloud Services on a PC. A machine learning service have to create and also a Watson studio, cloud storage service

instance to store dataset. A Jupyter notebook can be added to project & we have to write code to get authencated which include geng API key , instance ID, pre token etc.

4. EXPERIMENTAL INVESTIGATIONS



AUTO AI EXPERIMENT

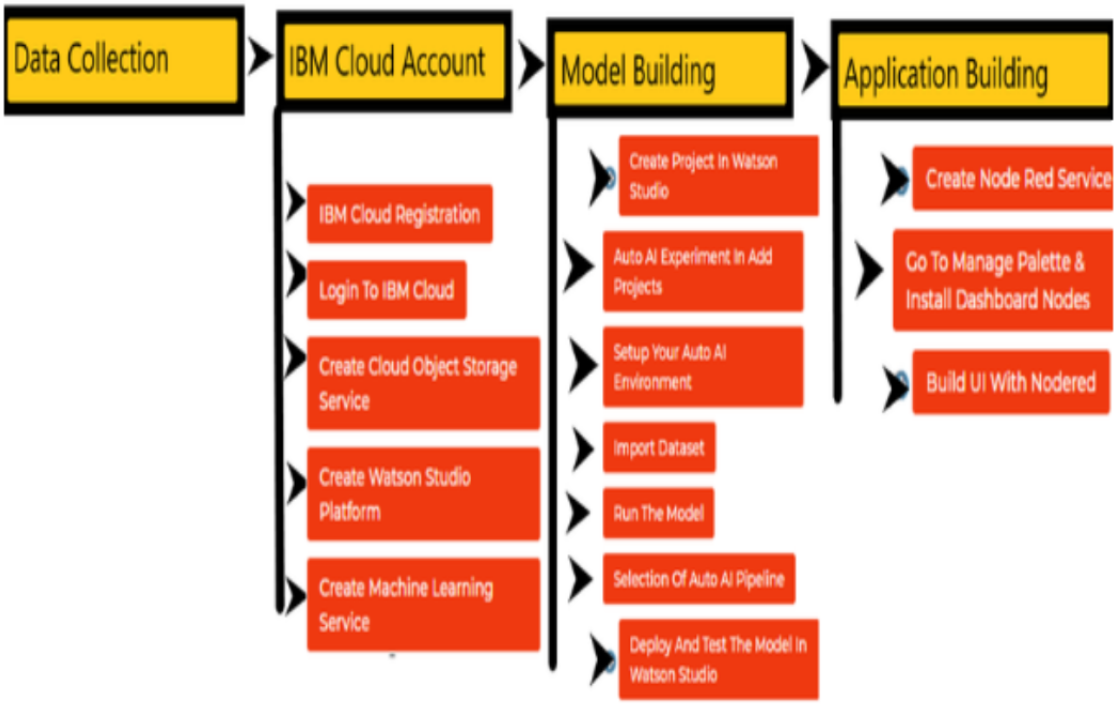
In Machine Learning, we create a project in IBM Watson Studio and we add an Auto AI Experiment to the project. We need to import our dataset to calculate the required output. Hence, we import/upload the 'datasets_26789_34175_pima-indians-diabetes.data' csv file and give 'Diabetic Mellitus Prediction' column of the dataset as the prediction column. Run the model and we get our required Auto AI Pipeline. We get the Relationship Map and Pipeline Comparison. We have to save the Auto AI pipeline as a model. We should deploy the saved model. Then we get to test the deployed model.

APPLICATION BUILDING(NODE-RED)

From the catalog of IBM Cloud we should install Node-Red Application. In this, we have 'Nodes' to the left side of the page and we use these nodes to create a 'flow'. We need to install 'Dashboard Nodes' by going to the 'Manage Palette' section.


Create a Node-Red Service
Manage Palette And Install Dashboard
Build UI With Node-Red

Flow Chart


Data Collection
IBM Cloud Account
IBM Cloud Registration
Login To IBM Cloud
Create Cloud Object Storage Service
Create Watson Studio Platform
Create Machine Learning Service
Model Building
Create Project In Watson Studio
Auto AI Experiment In Add Projects
Setup Your Auto AI Environment
Import Dataset
Run The Model
Selection Of Auto AI Pipeline
Deploy And Test The Model In Watson Studio
Application Building
Create Node Red Service
Go To Manage Palette & Install Dashboard Nodes
Build UI With Nodered

The whole project can be implemented in four steps.

1.The first step include collection of dataset.

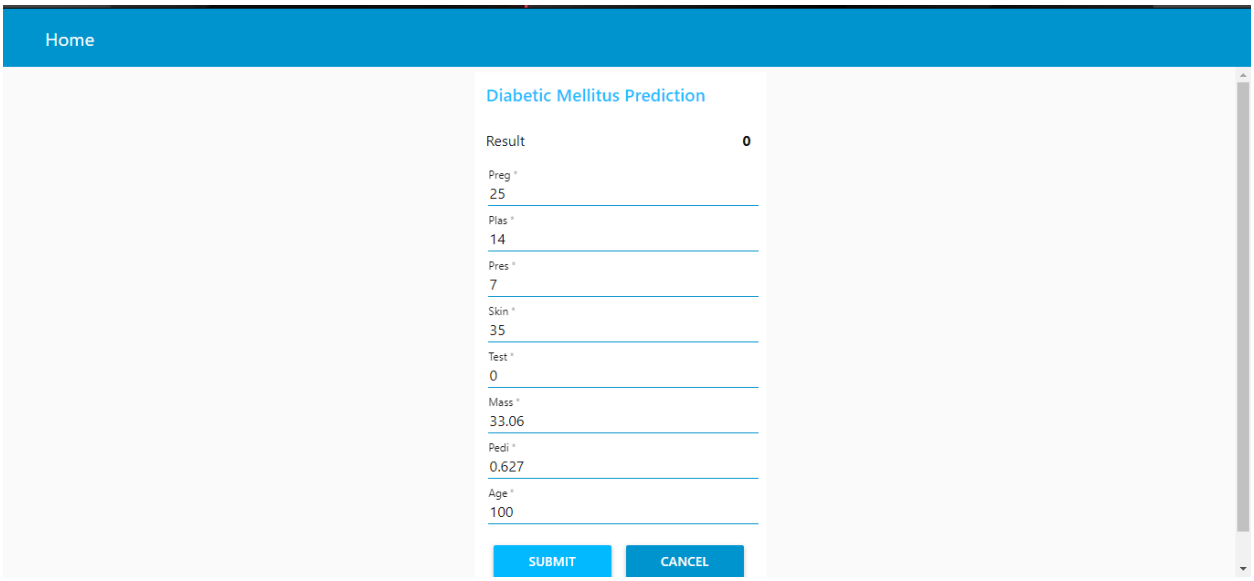
2.The second step is about IBM Cloud. It includes IBM cloud registration. Login to account and create cloud object service to store collected data, create Watson studio platform and machine learning service.

3.The third step is modelbuilding. Itconsist of create the project in Watson studio, set up Auto AI Environment. Import dataset and run the model. Select and save the best Auto AI pipeline. Deploy and test model in Watson studio.

4.The fourth step is application building. In this step we have to create Node Red service. After that go to ‘Manage Palette’ and install required nodes. Build UI with Node Red .

6. RESULT

By predicting the flow,we obtained the required output.The predicted value obtained in IBM Watson Studio and the predicted value obtained in Node-red matches when we give the same input values in both the applications.Hence,the flow is successfully built without any errors



7. ADVANTAGES AND DISADVANTAGES

ADVANTAGES	DISADVANTAGES
Easily identifies trends and patterns	Data Acquisition
No human intervention needed (automation)	Time and Resources
Continuous Improvement	Interpretation of Results
Handling multi-dimensional and multi-variety data	High error-susceptibility
Wide Applications	

8. APPLICATIONS

The applications of Machine Learning are:
Virtual Personal Assistants
○ Siri, Alexa, Google Now are some of the popular examples of virtual personal assistants. As the name suggests, they assist in finding information, when asked over voice.
Predictions While Commuting

- We all have been using GPS navigation services. While we do that, our current locations and
- velocities are being saved at a central server for managing traffic. This data is then used to build a map of current traffic. While this helps in preventing the traffic and does congestion analysis, the underlying problem is that there are less number of cars that are equipped with GPS.
- When booking a cab, the app estimates the price of the ride. When sharing these services, how do they minimize the detours? The answer is machine learning.

- Videos Surveillance

○ The video surveillance system nowadays are powered by AI that makes it possible to detect crime
before they happen. They track unusual behaviour of people like standing motionless for a long time, stumbling, or napping on benches etc. The system can thus give an alert to human attendants, which can ultimately help to avoid mishaps.

Social Media Services

○ From personalizing your news feed to better ads targeting, social media platforms are utilizing
machine learning for their own and user benefits. Email Spam And Malware Filtering

○ There are a number of spam filtering approaches that email clients use. To ascertain that these spam filters are continuously updated, they are powered by machine learning

9. CONCLUSION

Using the IBM Watson Auto AI Experiment we tested the model and using node red Application in IBM

cloud we created a UI where we deployed our model.The predicted value obtained in IBM Watson Studio Auto AI and the predicted value obtained in Node-red application matches each other when we give the same input values are given .Therefore model is successfully deployed can predict the Diabetic Mellitus.

10. FUTURE SCOPE

The scope of Machine Learning in India, as well as in other parts of the world, is high in comparison to other career fields when it comes to job opportunities. According to Gartner, there will be 2.3 million jobs in the field of Artificial Intelligence and Machine Learning by 2022. Also, the salary of a Machine Learning Engineer is much higher than the salaries offered to other job profiles.