# Diabetic Mellitus Prediction using IBM AutoAI

RSIP Career Basic ML 142

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# INDEX

## 1. INTRODUCTION : -

**a. Project Overview: -** The project entitled - "Diabetic Mellitus Prediction Using AutoAI" is built upon "AutoAI Experiment" asset of IBM Watson studio. The AutoAI used Gradient Boosting Classifier algorithm to train the model. The model can predict if the person has diabetes or not with an accuracy of 0.770. The model is then deployed on Node Red.

**b. Purpose: -** Diabetes mellitus is a chronic disease characterized by hyperglycaemia. 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.

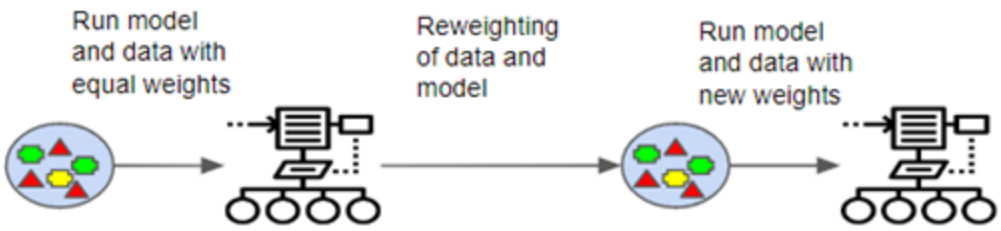
## 2. LITERATURE SURVEY: -

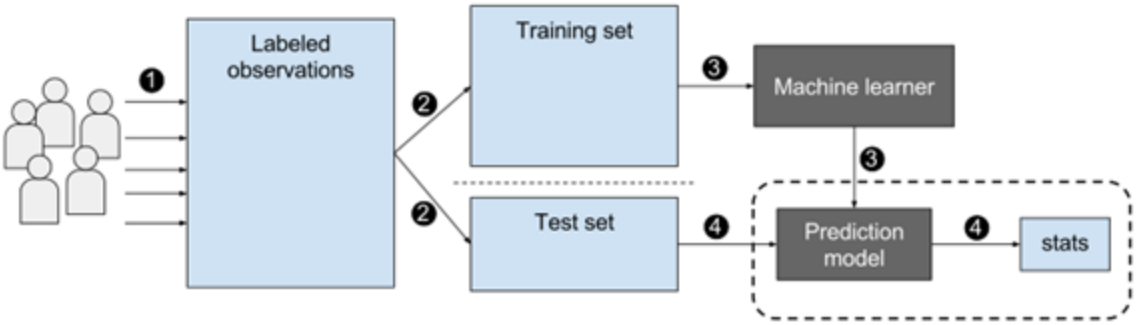
**a. Existing Problem :-** The complications of diabetes: patients suffers heart attacks or strokes, others required dialysis after kidney failure, still others had chronic numbness or pain caused by the effect of high blood sugar on the nerves in their legs.As of 2014, it is estimated that almost 30 million Americans have diabetes. In other words, 1 of 10 of our family, friends, or neighbours has the disease. If uncontrolled, diabetes can damage your heart, blood vessels, eyes, kidneys, and nerves. This is why it is so important to get screened for diabetes and take steps to prevent it if you are identified to be at increased risk.

**b. 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. THEORETICAL ANALYSIS: -

### a. Block Diagram: -

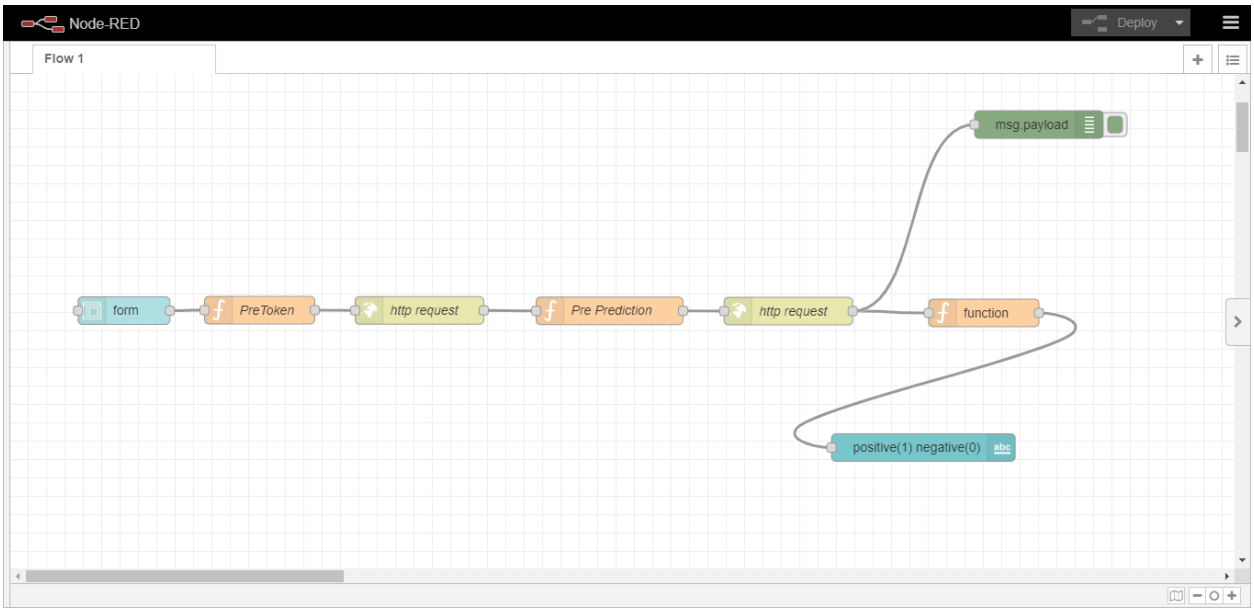


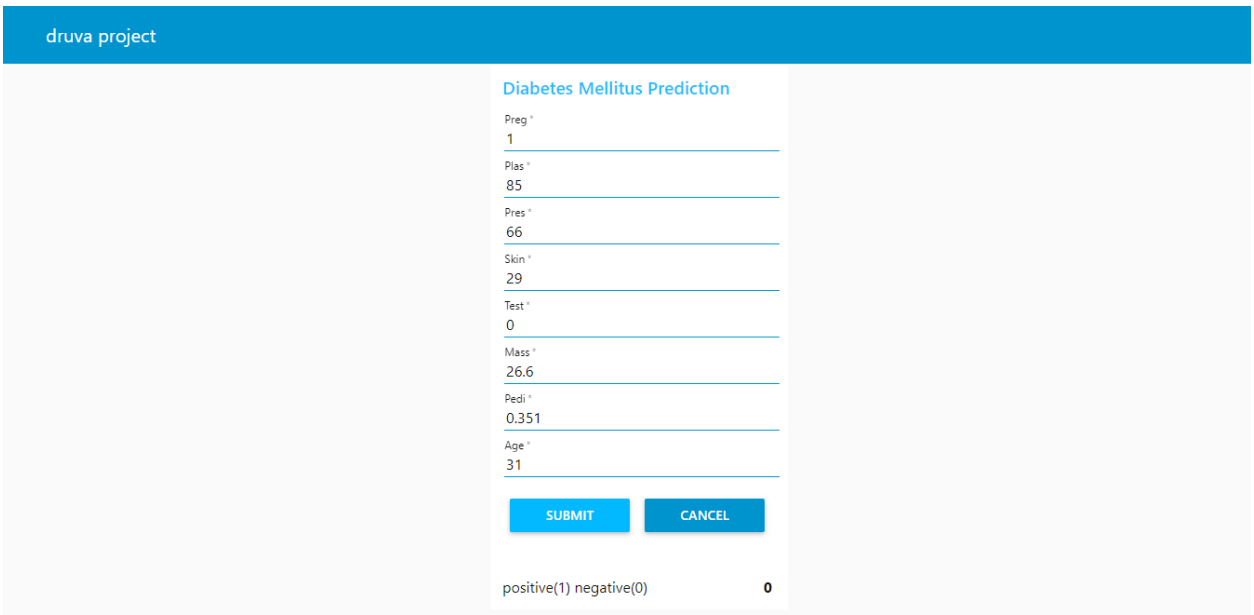

**b. Software design: -** The project model is developed on ibm cloud's autoai experiment under watson studio in which data is given as a csv file and one has to chose which column it should predict then it automatically chooses the algorithm according to the data given and expected output. this model is then deployed on node red.

**4. EXPERIMENTAL INVESTIGATION: -** In 2014, 8.5% of adults aged 18 years and older had diabetes. In 2016, diabetes was the direct cause of 1.6 million deaths and in 2012 high blood glucose was the cause of another 2.2 million deaths.Between 2000 and 2016, there was a 5% increase in premature mortality from diabetes. In high-income countries the premature mortality rate due to diabetes decreased from 2000 to 2010 but then increased in 2010-2016. In lower-middle-income countries, the premature mortality rate due to diabetes increased across both periods.By contrast, the probability of dying from any one of the four main non communicable diseases (cardiovascular diseases, cancer, chronic respiratory diseases or diabetes) between the ages of 30 and 70 decreased by 18% globally between 2000 and 2016.

## 5. FLOW CHART: -




**6.RESULT:-**After the implimentation of the project the ui predicts at waht 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 classfication



## 7. ADVANTAGES AND DISADVANTAGES: -

**a. Advantages: -**

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

**b. Disadvantages: -**

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

## 8. APPLICATIONS: -

8.1. Can be used in healthcare facilities.
8.2. This model is Available remotely and can be accessed anywhere.
8.3. It will be a great option for screening purpose.

**9.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. I personally thinks that AutoAI needs some more development as the prediction would be much easier if Random Forest was used instead of Gradient boosting.

**10.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.

## 11. BIBILIOGRAPHY

1.
https://node-red-oryjj.eu-gb.mybluemix.net/ui/#!/0?socketid=cj8dCETYaguyWYQ8AAAK
2.
https://www.ibm.com/in-en/cloud
3.
https://en.wikipedia.org/wiki/Machine_learning

## 12. APPENDIX

**a.Source code :-**

**pretoken:**

```
global.set("pg",msg.payload.pg)
global.set("ps",msg.payload.ps)
global.set("pr",msg.payload.pr)
global.set("sk",msg.payload.sk)
global.set("ts",msg.payload.ts)
global.set("ms",msg.payload.ms)
global.set("pd",msg.payload.pd)
global.set("ag",msg.payload.ag)
var apikey="ZWO6PjEXudqHRg0c0sYhT-cya7MkW502YZbIxpclqmbq";
msg.headers={"content-type":"application/x-www-form-urlencoded"}
msg.payload={"grant_type":"urn:ibm:params:oauth:grant-type:apikey","apikey":apikey}
return msg;
```

**pre prediction:**

```
var pg = global.get('pg')
var ps = global.get('ps')
var pr = global.get('pr')
var sk = global.get('sk')
var ts = global.get('ts')
var ms = global.get('ms')
var pd = global.get('pd')
var ag = global.get('ag')
```

```
var token=msg.payload.access_token
var instance_id="3ba012ae-39af-4a78-a71c-a6cb14851e75"
msg.headers={'Content-Type': 'application/json',"Authorization":"Bearer "+token,"ML-Instance-ID":instance_id}
msg.payload={"input_data": [{"fields": ["preg", " plas", "pres", "Skin ", "test", "mass", "pedi", "age"], "values": [[pg,ps,pr,sk,ts,ms,pd,ag]]}]}
return msg;
```

**function**:

```
msg.payload=msg.payload.predictions[0].values[0][0]
return msg;
```

**b.UI output screenshot:-**