SmartInternz Gurucool Project

Project Title

Predict heart failure using IBM Auto AI service

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Introduction

This project deals the prediction of heart failure using IBM Auto AI Service for Healthcare domain. The complexity of the project is basic level. The technology used is IBM Cloud application. Cardiovascular Diseases (CVD) are number one cause of death globally, taking an estimated 17.9 million lives each year, which accounts for 31% of all deaths worldwide. Heart failure is the common event caused by CVDs and this dataset contains 9 features that can be used to predict mortality of heart failure.

In this project I built a model using Auto AI experiments and build a web application using Node-red to predict heart failure. Here I used following **IBM Services**

1. IBM Watson Studio
2. IBM Watson Machine learning
3. Node-Red
4. IBM Cloud storage object

Procedure to be followed

1. Open Watson studio
2. Create a project (Prediction of heart failure)
3. Add Auto AI experiment
4. Create a ML Instance
5. Associate ML instance to project
6. Load the dataset to cloud storage object
7. Train the model
8. Deploy it - get an API
9. Build web application using Node-Red

1. Project Initiation - Open Watson Studio

Login into http://www.cloud.ibm.com website, click Dashboard and click services.
Click Watson Studio-> get started.
In the left side corner, find ***Project***, click it and then click ***New project*** on the right side corner.

2. Create an empty project

Design name: Predict hear failure model
Storage: Cloud object storage (If it is not present, add it) then click create

In the new page, I get machine learning model ->click Add to project.

3. Add Auto AI Experiment

Given name as: Predict heart failure model, then

4. Create a ML Instance

5. Associate ML Service Instance

Click **Associate ML service Instance ->** Click New service -> Select Machine learning
Select region: Dallas and
choose ***lite planner*** then click create.

Here I found difficulty to associate ML instance, because I already have associated with ML Instance. So I moved to
Dashboard -> services ->Choose machine learning instance and deleted it

6**. Load dataset**

Next add data source: click browse and choose dataset from the github link given below
Dataset github link: https://github.com/IBM/predictive-model-on-watson-ml
Download it from github link and upload it in the data source

After loading dataset it is necessary to choose which parameter do we want to predict.

Select prediction column
Click Heartfailure

7. Train the model

Under Prediction column: it displays the following information

Binary classification Y Accuracy

Then click ***run the experiment***, Click ***save as model*** and save it

Model name: Predict heart failure model
P5 XGB Classifier Estimator

Click view in project
And promote to deployment space

8. Deploy it – get an API code

Under this, click on new space -> type space name
Space name: Predict heart failure model -> click create ->close
Finally target space created and promoted

Click Navigation -> choose deployment spaces -> click view all spaces -> Select your project-> Click your model-> Deployment types- Click deployment -> Online

(There are two modes – online and Batch)

9. Build web application using Node-Red

Click Node Red- > Manage -> click ***ML.AI.Json file*** to Import

At the same time, go to IBM Cloud -> Click Manage and get Access IAM (to create API reference Endpoint)

Endpoint:
https://us-south.ml.cloud.ibm.com/ml/v4/deployments/b437aefd-41af-4a72-9590-17102431f8e1/predictions

API key successfully created, copy it

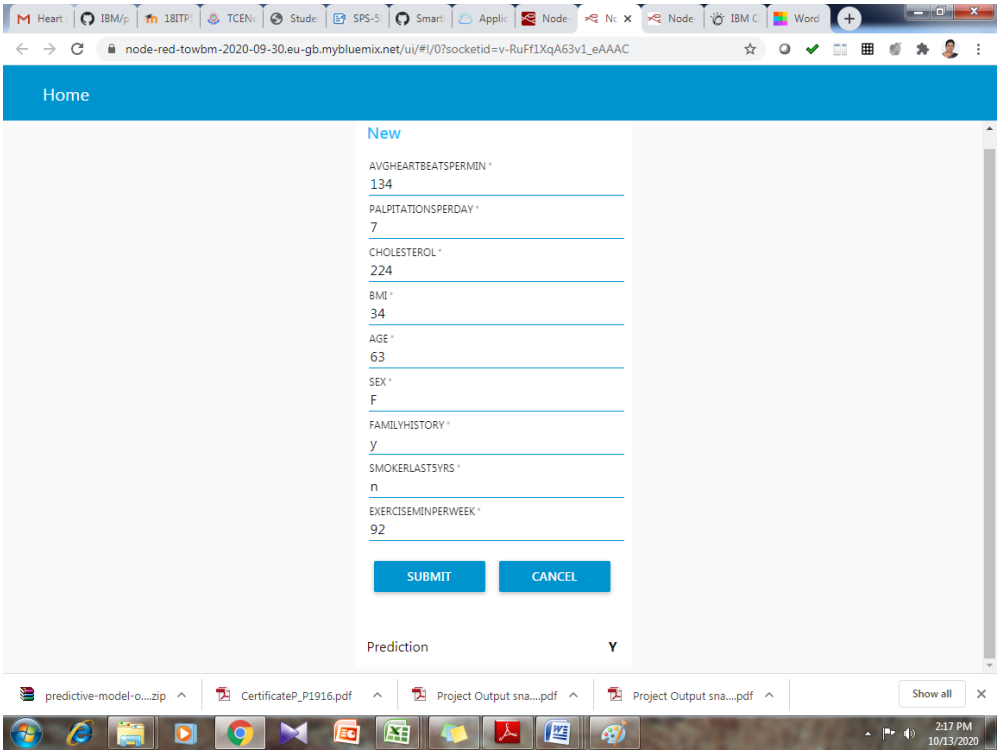
At the same time

Click Dashboard- > ***Cloud foundry apps*** -> Choose ***NodeRed*** -> click -> ***Visit App URL***

It will take you to NodeRed

Do the following changes

1. Open ***form node*** and add all parameter present in the dataset
2. Open ***pre-token node*** , remove existing API key and place your new API key
3. Open ***parsing node***, edit prediction value as
   msg.payload=msg.payload.predictions[0].values[0][0]
4. Open ***2nd http request*** and paste your endpoint as
   https://us-south.ml.cloud.ibm.com/ml/v4/deployments/b437aefd-41af-4a72-9590-17102431f8e1/predictions
5. Finally ***deploy it and run your application***



Conclusion:

The prediction of heart failure using IBM Auto AI service has been successfully implemented using the following IBM Services.

1. IBM Watson Studio
2. IBM Watson Machine learning
3. Node-Red
4. IBM Cloud storage object

Heart failure is the common event caused by CVDs and this dataset contains 9 features that can be used to predict mortality of heart failure. The web application is developed by using Node-Red IBM service.