Internship title : **RSIP Career Basic ML 100**
Project ID : **SPS_PRO_289**
Project Title : **Diabetic Mellitus Prediction using IBM Auto AI**
Team : **SB**

Project Description:

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.

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 displays whether the avalanche occurs or not and how strength it was. To analyze 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 being built in Auto AI.

ACKNOWLEDGEMENT

Its been an enjoyable journey since the very first day of my remort summer internship offered by SMART BRIDGE team. during these unprecedented times, when there was no hope left of getting a summer internship extraneously then I got to know about this valuable opportunity which they were offering. The team and their members have burned the midnight oil to make this reality happen and to enlighten so many young minds with remarkably worthy experience.

I am thankful to the whole Smart Bridge team which made us learn things that are worth it and have huge scope in future in the field of Artificial Intelligence, Machine learning, IoT and integrated model making using the advance algorithms.

Being from a non-technical branch, I not only learned the concepts but have gained interests towards the development of those in a real life.

The application plays an important role while learning because they make us think substantially for a solution to any problem and this is what the arena of the mentors who have taught us was, while teaching.

special thanks to Mr Surya tej sir(mentor to my machine learning course).

DATA-COLLECTION

- the data was given as a list of features and I had to predict that whether or not person is a diabetic patient.

- it was given in the csv format in excel having 9 columns and 786 rows. rows were the values of the given 9 features wherein 9th feature was the one I had to predict about.

- 8 features which are the part of deployment are : preg, plas, pres, skin, test, mass, pedi, age

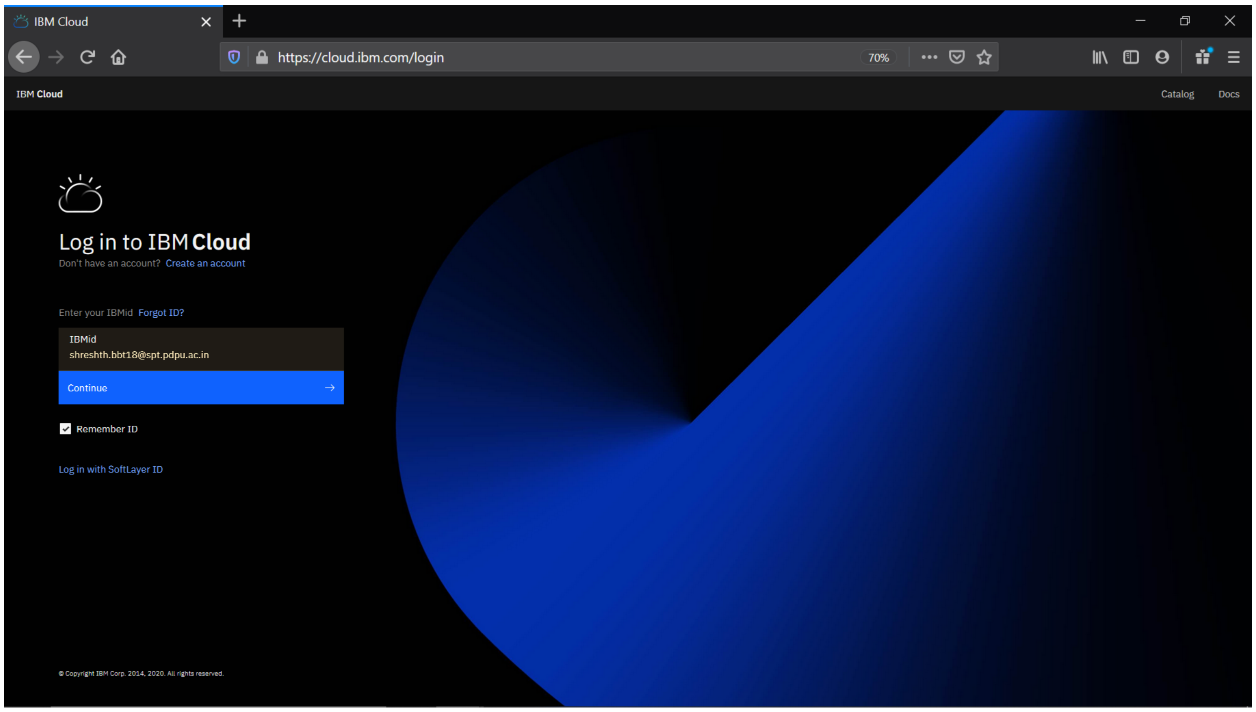
- 1 feature which tells that whether person is diabetic or not. I had to classify here with 1 and 0 as former signifies that the person is a patient of diabetic mellitus and the later shows that person is free from diabetic mellitus.

- DATA SET LINK : here I had to proceed with the dataset. link redirected me to the kaggle service from where data set file was present .

IBM CLOUD ACCOUNT

To get an access to IBM Cloud Services , one needs to create an account on it .
here, I will conclude the steps from creating IBM cloud accunt till Machine Learning Service with the help of images in a proceeding order.

STEP-1: Create an IBM Cloud account and log in into it using certain valid credentials.


IBM Cloud
https://cloud.ibm.com/login
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IBM Cloud
Catalog
Docs
Log in to IBM Cloud
Don't have an account? Create an account
Enter your IBMid Forgot ID?
IBMid
shreshth.bbt18@spt.pdpu.ac.in
Continue
Remember ID
Log in with SoftLayer ID
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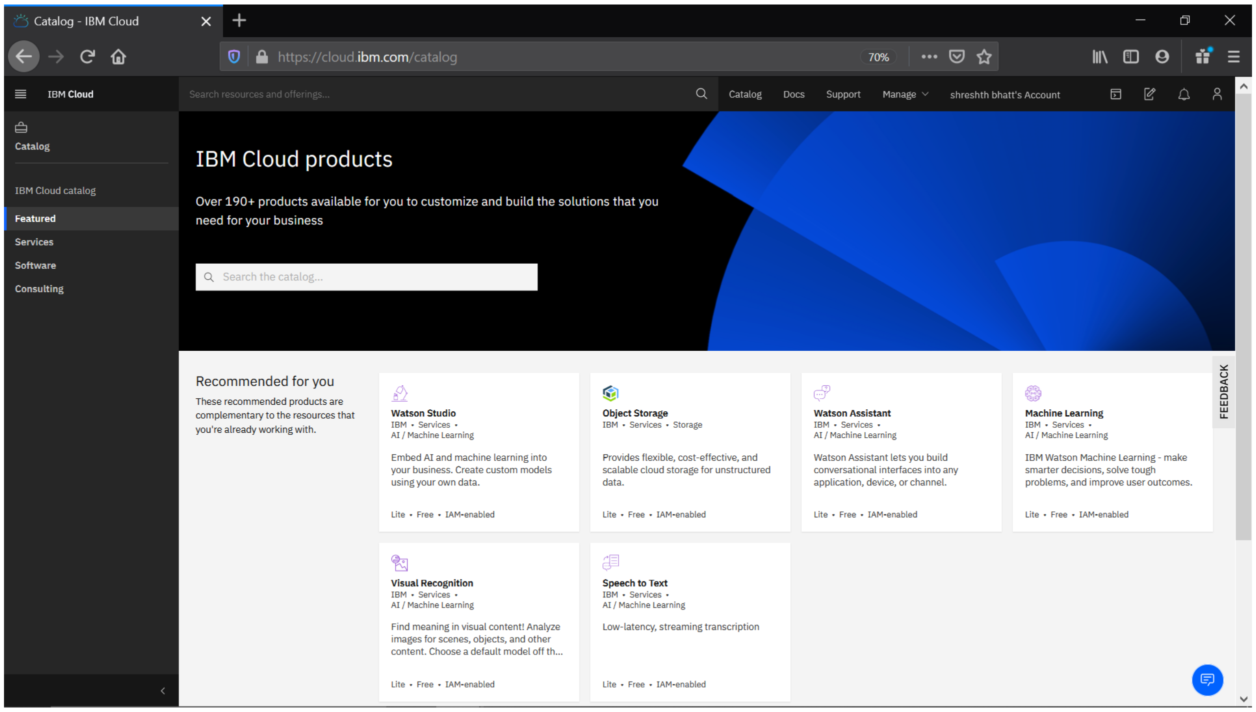
STEP-2: In the Header section, Catalog Tab is present to create resources necessary for making a project.


Catalog - IBM Cloud

https://cloud.ibm.com/catalog

IBM Cloud | Search resources and offerings... | Catalog | Docs | Support | Manage | shreshth bhatt's Account

Catalog
IBM Cloud catalog
Featured
Services
Software
Consulting

IBM Cloud products

Over 190+ products available for you to customize and build the solutions that you need for your business

Search the catalog...

Recommended for you

These recommended products are complementary to the resources that you're already working with.

Watson Studio
IBM • Services • AI / Machine Learning
Embed AI and machine learning into your business. Create custom models using your own data.
Lite • Free • IAM-enabled

Object Storage
IBM • Services • Storage
Provides flexible, cost-effective, and scalable cloud storage for unstructured data.
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Watson Assistant
IBM • Services • AI / Machine Learning
Watson Assistant lets you build conversational interfaces into any application, device, or channel.
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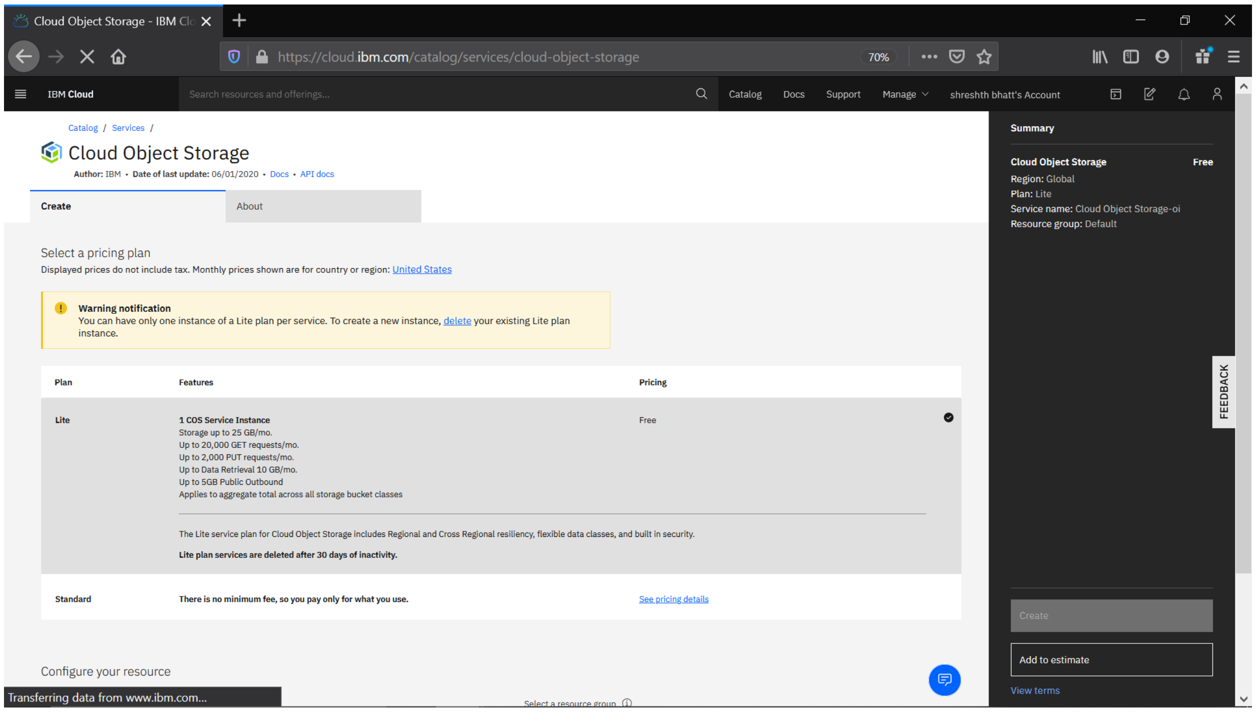
Machine Learning
IBM • Services • AI / Machine Learning
IBM Watson Machine Learning - make smarter decisions, solve tough problems, and improve user outcomes.
Lite • Free • IAM-enabled

Visual Recognition
IBM • Services • AI / Machine Learning
Find meaning in visual content! Analyze images for scenes, objects, and other content. Choose a default model off th...
Lite • Free • IAM-enabled

Speech to Text
IBM • Services • AI / Machine Learning
Low-latency, streaming transcription
Lite • Free • IAM-enabled

FEEDBACK

STEP-3: on the same page, create CLOUD STORAGE for storing all the data of the project.


Cloud Object Storage - IBM Cl

https://cloud.ibm.com/catalog/services/cloud-object-storage

IBM Cloud | Search resources and offerings... | Catalog | Docs | Support | Manage | shreshth bhatt's Account

Catalog / Services /

Cloud Object Storage

Author: IBM • Date of last update: 06/01/2020 • Docs • API docs

Create | About

Select a pricing plan

Displayed prices do not include tax. Monthly prices shown are for country or region: United States

Warning notification
You can have only one instance of a Lite plan per service. To create a new instance, delete your existing Lite plan instance.

Plan	Features	Pricing
Lite	**1 COS Service Instance** Storage up to 25 GB/mo. Up to 20,000 GET requests/mo. Up to 2,000 PUT requests/mo. Up to Data Retrieval 10 GB/mo. Up to 5GB Public Outbound Applies to aggregate total across all storage bucket classes The Lite service plan for Cloud Object Storage includes Regional and Cross Regional resiliency, flexible data classes, and built in security. **Lite plan services are deleted after 30 days of inactivity.**	Free
Standard	**There is no minimum fee, so you pay only for what you use.**	See pricing details

Configure your resource

Select a resource group

Transferring data from www.ibm.com...

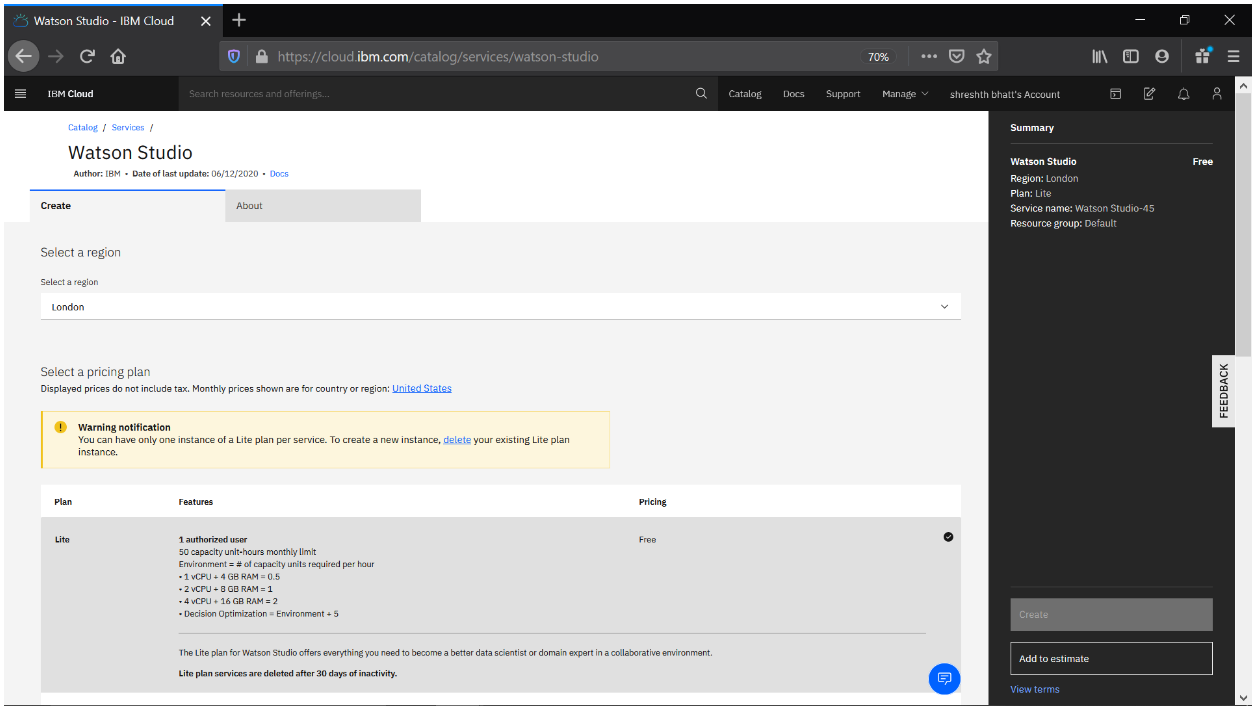
Summary

Cloud Object Storage Free
Region: Global
Plan: Lite
Service name: Cloud Object Storage-oi
Resource group: Default

Create
Add to estimate
View terms

FEEDBACK

STEP-4: Now, create Watson Studio to keep the projects in it.


Watson Studio - IBM Cloud

https://cloud.ibm.com/catalog/services/watson-studio

IBM Cloud

Catalog / Services /

Watson Studio

Author: IBM • Date of last update: 06/12/2020 • Docs

Create | About

Select a region

Select a region: London

Select a pricing plan

Displayed prices do not include tax. Monthly prices shown are for country or region: United States

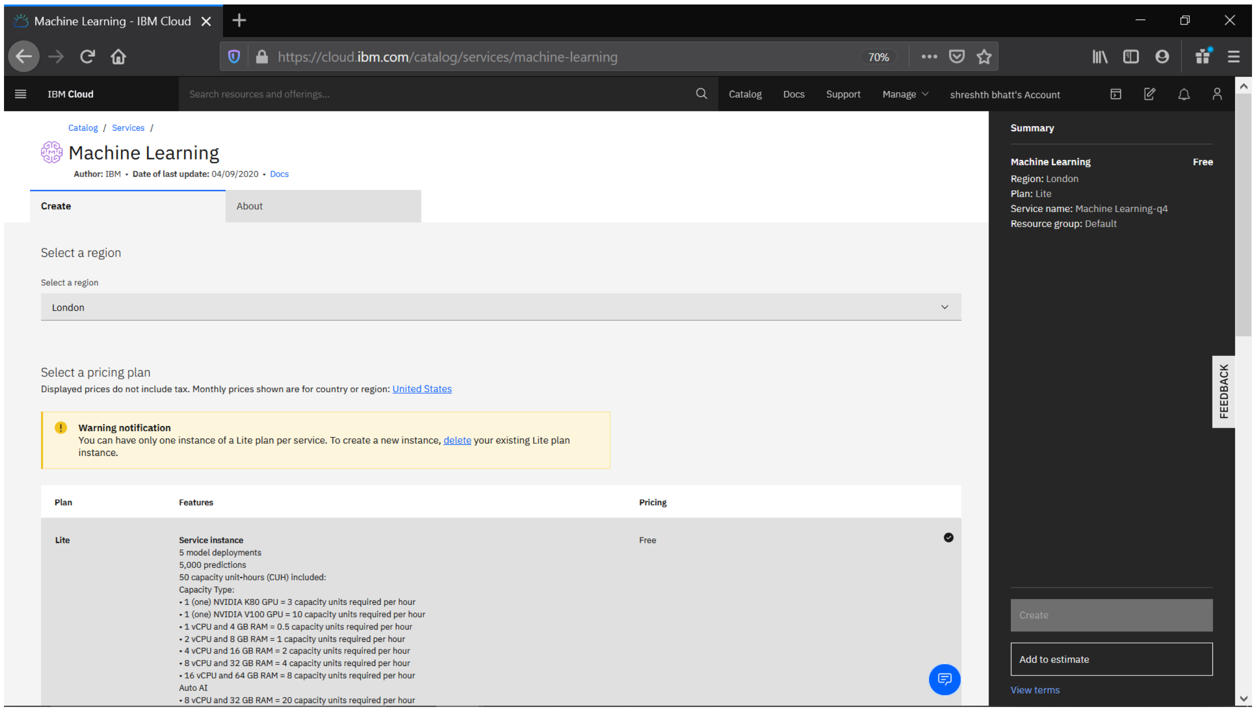
Warning notification
You can have only one instance of a Lite plan per service. To create a new instance, delete your existing Lite plan instance.

Plan	Features	Pricing
Lite	**1 authorized user** 50 capacity unit-hours monthly limit Environment = # of capacity units required per hour • 1 vCPU + 4 GB RAM = 0.5 • 2 vCPU + 8 GB RAM = 1 • 4 vCPU + 16 GB RAM = 2 • Decision Optimization = Environment + 5 The Lite plan for Watson Studio offers everything you need to become a better data scientist or domain expert in a collaborative environment. **Lite plan services are deleted after 30 days of inactivity.**	Free

Summary

Watson Studio **Free**
Region: London
Plan: Lite
Service name: Watson Studio-45
Resource group: Default

STEP-5: now, according to the services need, install the required one, here I chosen Machine Learning Services.


Machine Learning - IBM Cloud

https://cloud.ibm.com/catalog/services/machine-learning

IBM Cloud

Catalog / Services /

Machine Learning

Author: IBM • Date of last update: 04/09/2020 • Docs

Create | About

Select a region

Select a region: London

Select a pricing plan

Displayed prices do not include tax. Monthly prices shown are for country or region: United States

Warning notification
You can have only one instance of a Lite plan per service. To create a new instance, delete your existing Lite plan instance.

Plan	Features	Pricing
Lite	**Service instance** 5 model deployments 5,000 predictions 50 capacity unit-hours (CUH) included: Capacity Type: • 1 (one) NVIDIA K80 GPU = 3 capacity units required per hour • 1 (one) NVIDIA V100 GPU = 10 capacity units required per hour • 1 vCPU and 4 GB RAM = 0.5 capacity units required per hour • 2 vCPU and 8 GB RAM = 1 capacity units required per hour • 4 vCPU and 16 GB RAM = 2 capacity units required per hour • 8 vCPU and 32 GB RAM = 4 capacity units required per hour • 16 vCPU and 64 GB RAM = 8 capacity units required per hour Auto AI • 8 vCPU and 32 GB RAM = 20 capacity units required per hour	Free

Summary

Machine Learning **Free**
Region: London
Plan: Lite
Service name: Machine Learning-q4
Resource group: Default

MODEL BUILDING:

Now comes the most important part of the project : to build the model using installed services in our watson studio having certain instance name.

I have chosen the most optimised model through accuracy score and then predicted about that which model could give the more appropriate values.

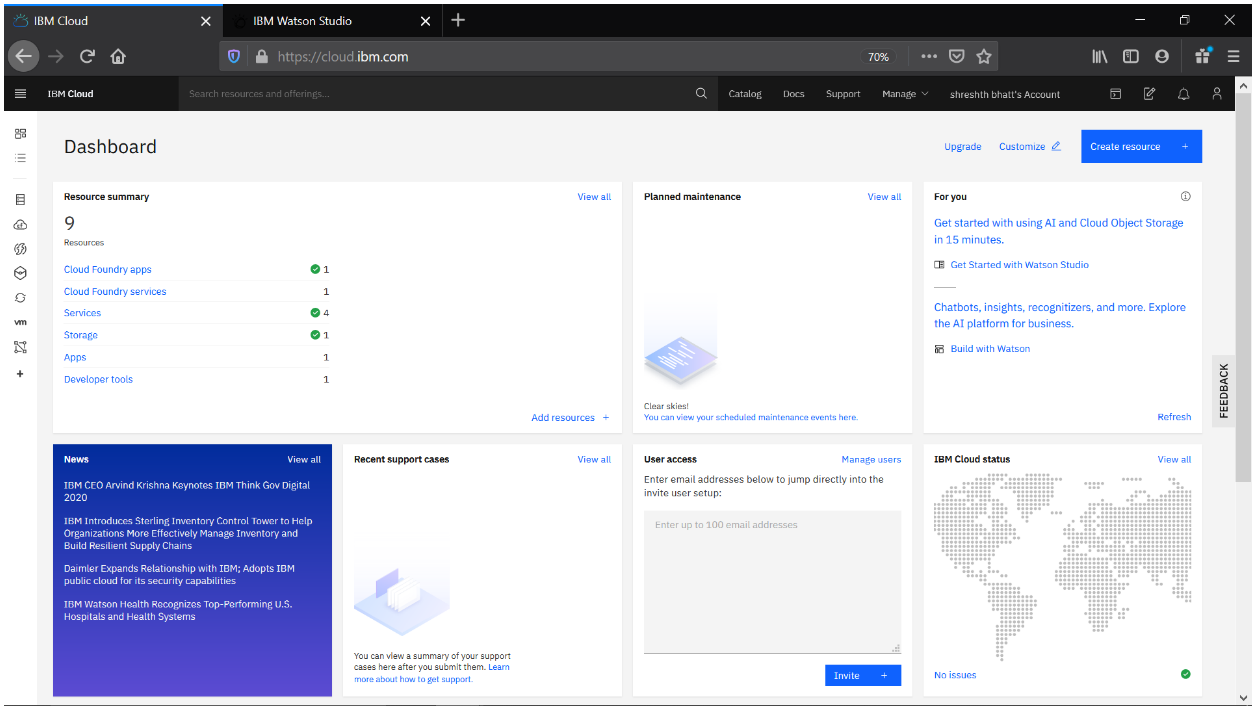
And the chosen model was deployed to give the outputs.
here , we can test, implement and see the result in our watson studio machine learning service.

The model was not build manually but with the help of Auto AI experiment.

The model with highest accuracy score was selected and deployed.

Given below were the steps I took to build a AUTO AI MODEL:

STEP-1: Click on the IBM CLOUD Tab given in the top left corner of the window next to navigation button.



Dashboard

Resource summary View all

9
Resources

Cloud Foundry apps	✓ 1
Cloud Foundry services	1
Services	✓ 4
Storage	✓ 1
Apps	1
Developer tools	1

Add resources +

Planned maintenance View all

Clear skies!
You can view your scheduled maintenance events here.

For you

Get started with using AI and Cloud Object Storage in 15 minutes.

Get Started with Watson Studio

Chatbots, insights, recognizers, and more. Explore the AI platform for business.

Build with Watson

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IBM Introduces Sterling Inventory Control Tower to Help Organizations More Effectively Manage Inventory and Build Resilient Supply Chains

Daimler Expands Relationship with IBM; Adopts IBM public cloud for its security capabilities

IBM Watson Health Recognizes Top-Performing U.S. Hospitals and Health Systems

Recent support cases View all

You can view a summary of your support cases here after you submit them. Learn more about how to get support.

User access Manage users

Enter email addresses below to jump directly into the invite user setup:

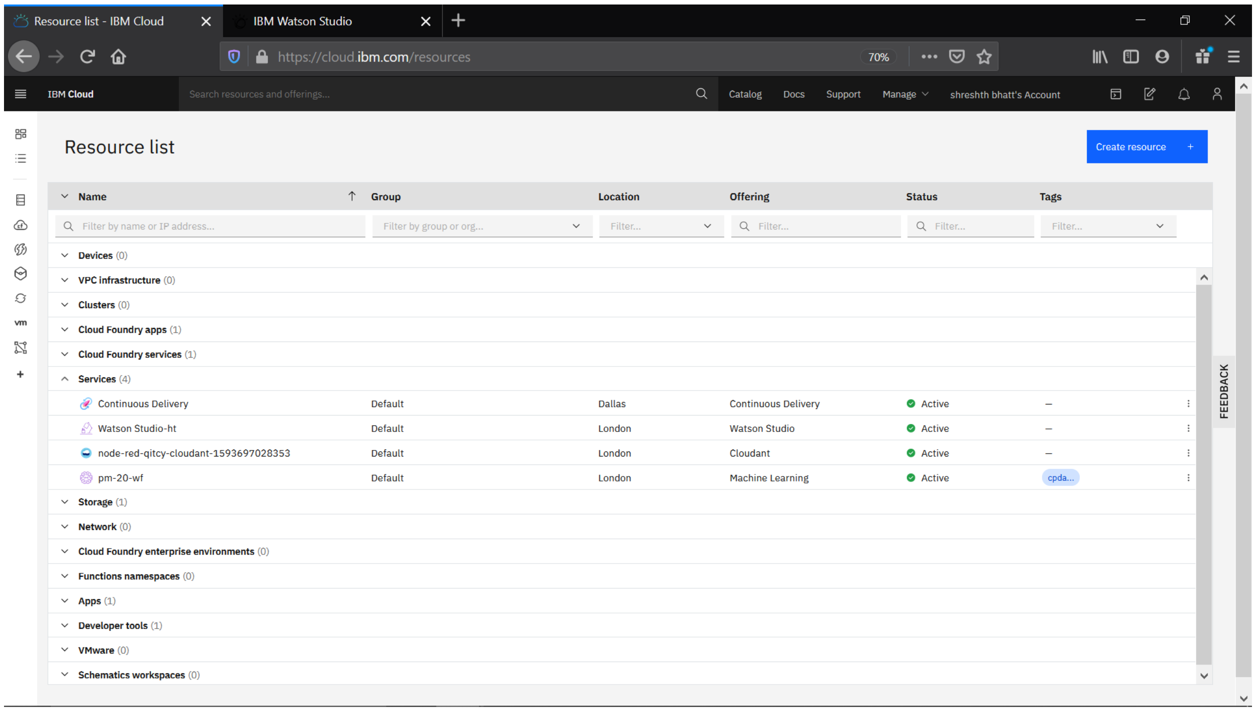
Enter up to 100 email addresses

Invite +

IBM Cloud status View all

No issues

STEP-2: On the Dashboard window, click on the services :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IBM Watson Studio
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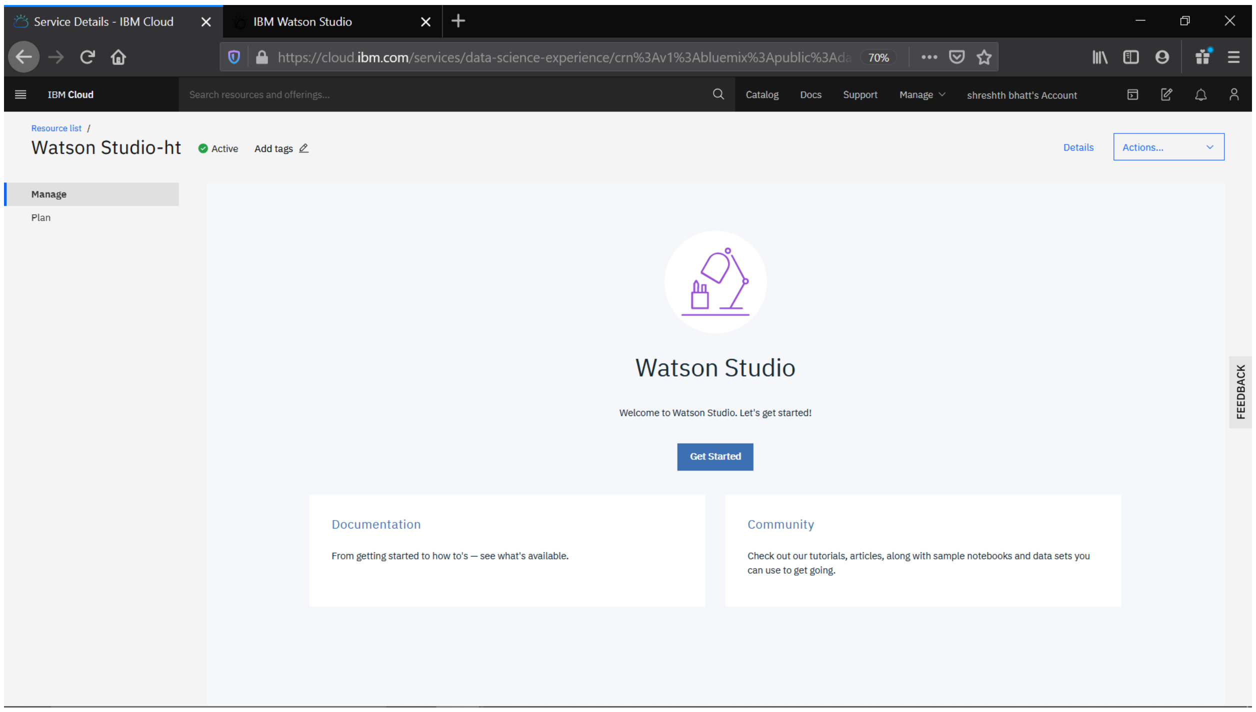
FEEDBACK

Resource list

Create resource +

Name	Group	Location	Offering	Status	Tags
Filter by name or IP address...	Filter by group or org...	Filter...	Filter...	Filter...	Filter...
Devices (0)					
VPC infrastructure (0)					
Clusters (0)					
Cloud Foundry apps (1)					
Cloud Foundry services (1)					
Services (4)					
Continuous Delivery	Default	Dallas	Continuous Delivery	Active	–
Watson Studio-ht	Default	London	Watson Studio	Active	–
node-red-qitcy-cloudant-1593697028353	Default	London	Cloudant	Active	–
pm-20-wf	Default	London	Machine Learning	Active	cpda...
Storage (1)					
Network (0)					
Cloud Foundry enterprise environments (0)					
Functions namespaces (0)					
Apps (1)					
Developer tools (1)					
VMware (0)					
Schematics workspaces (0)					

STEP-3: click on Watson Studio to proceed further as we have to add Auto AI experiment to our project which is already present in Watson Studio.


Service Details - IBM Cloud
IBM Watson Studio
https://cloud.ibm.com/services/data-science-experience/crn%3Av1%3Abluemix%3Apublic%3Ad
70%
IBM Cloud
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Resource list /
Details
Actions...
Manage
Plan
FEEDBACK

Watson Studio-ht Active Add tags

Watson Studio

Welcome to Watson Studio. Let's get started!

Get Started

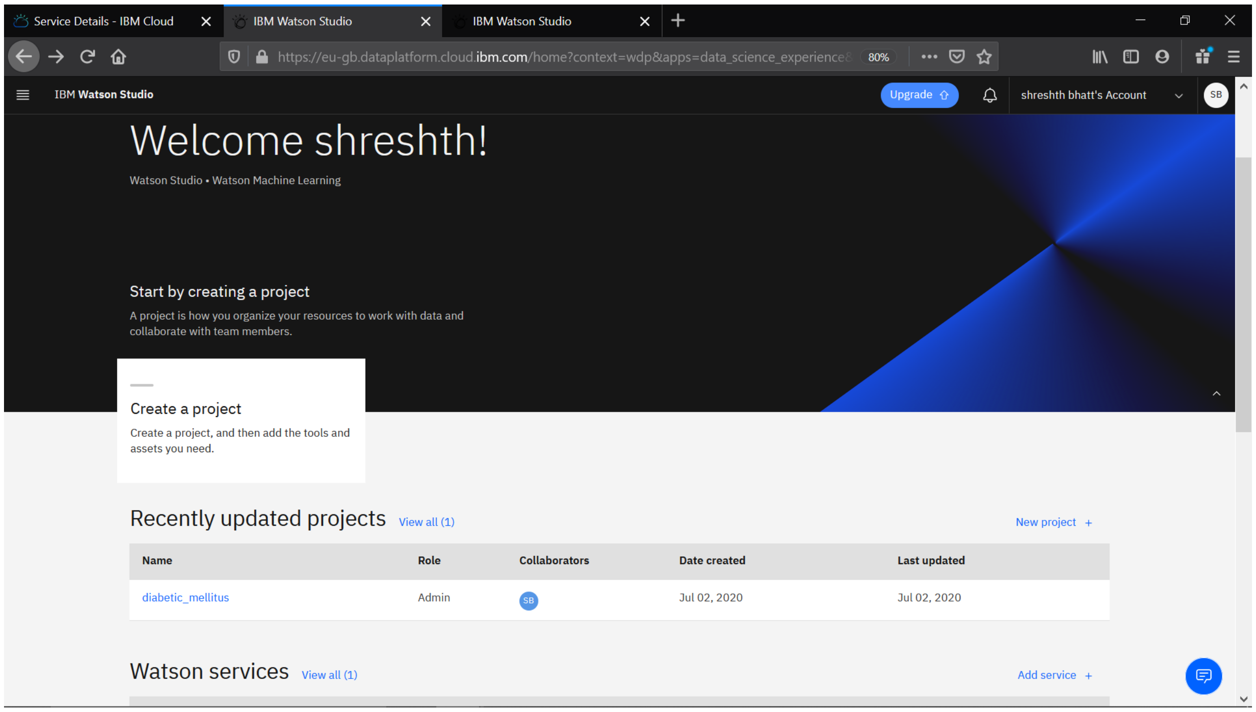
Documentation

From getting started to how to's — see what's available.

Community

Check out our tutorials, articles, along with sample notebooks and data sets you can use to get going.

STEP-4: choose the project name by hovering the cursor on the instance name of the project(diabetic_mellitus)


Service Details - IBM Cloud
IBM Watson Studio
IBM Watson Studio
https://eu-gb.dataplatform.cloud.ibm.com/home?context=wdp&apps=data_science_experience&
80%
IBM Watson Studio
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SB

Welcome shreshth!

Watson Studio • Watson Machine Learning

Start by creating a project

A project is how you organize your resources to work with data and collaborate with team members.

Create a project

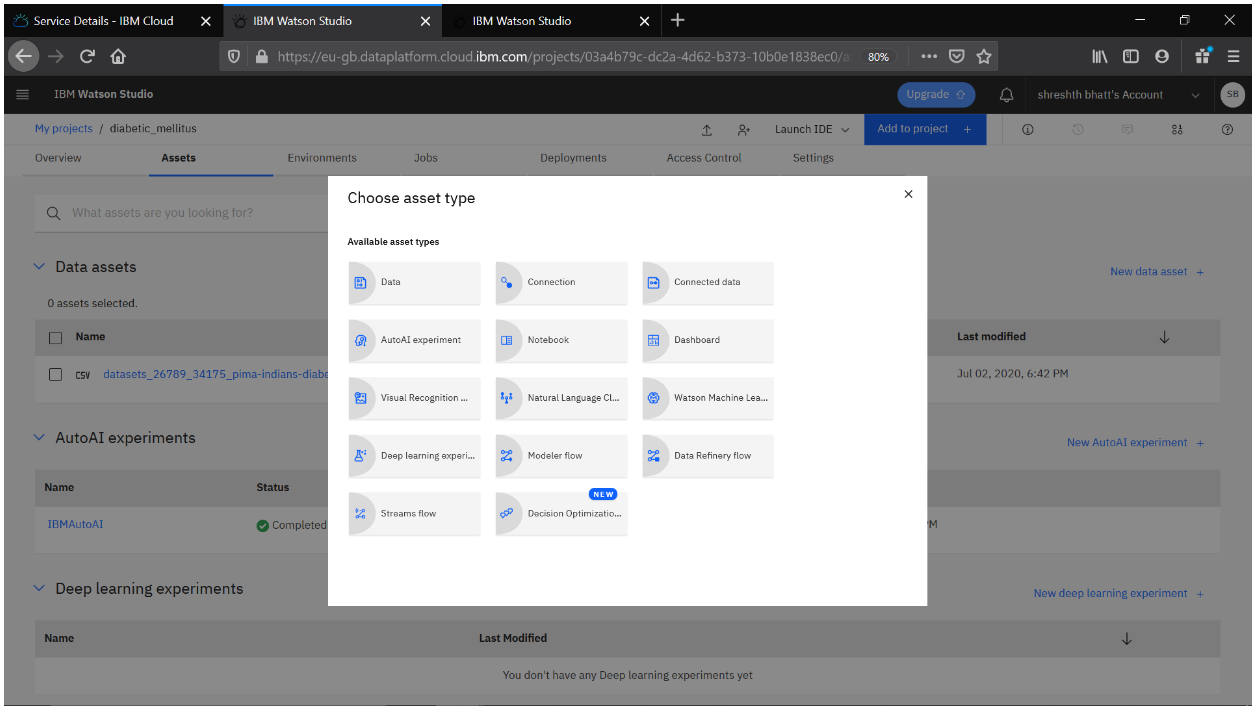
Create a project, and then add the tools and assets you need.

Recently updated projects View all (1) New project +

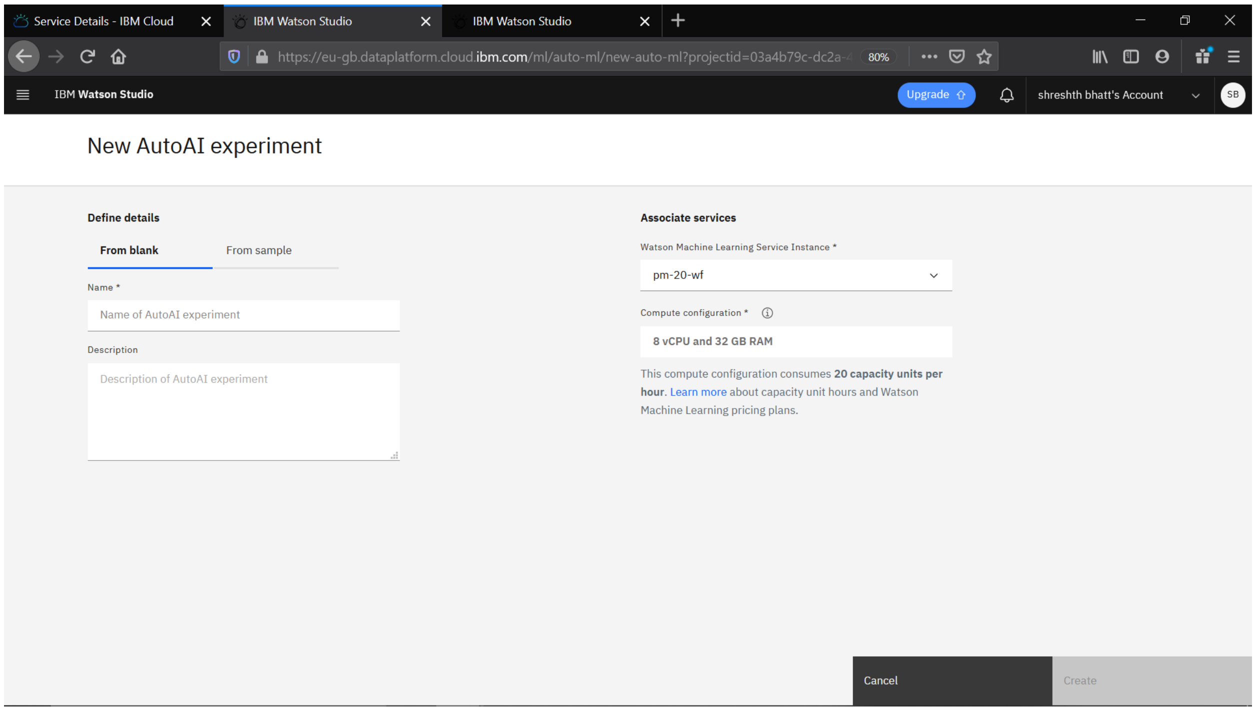
Name	Role	Collaborators	Date created	Last updated
diabetic_mellitus	Admin	SB	Jul 02, 2020	Jul 02, 2020

Watson services View all (1) Add service +

STEP-5: At the top right corner select the Add to Project option and choose AUTO AI Experiment.



STEP-6: Fill the following credentials and run the AI experiment.


Service Details - IBM Cloud
IBM Watson Studio
IBM Watson Studio
https://eu-gb.dataplatform.cloud.ibm.com/ml/auto-ml/new-auto-ml?projectid=03a4b79c-dc2a-
IBM Watson Studio
Upgrade
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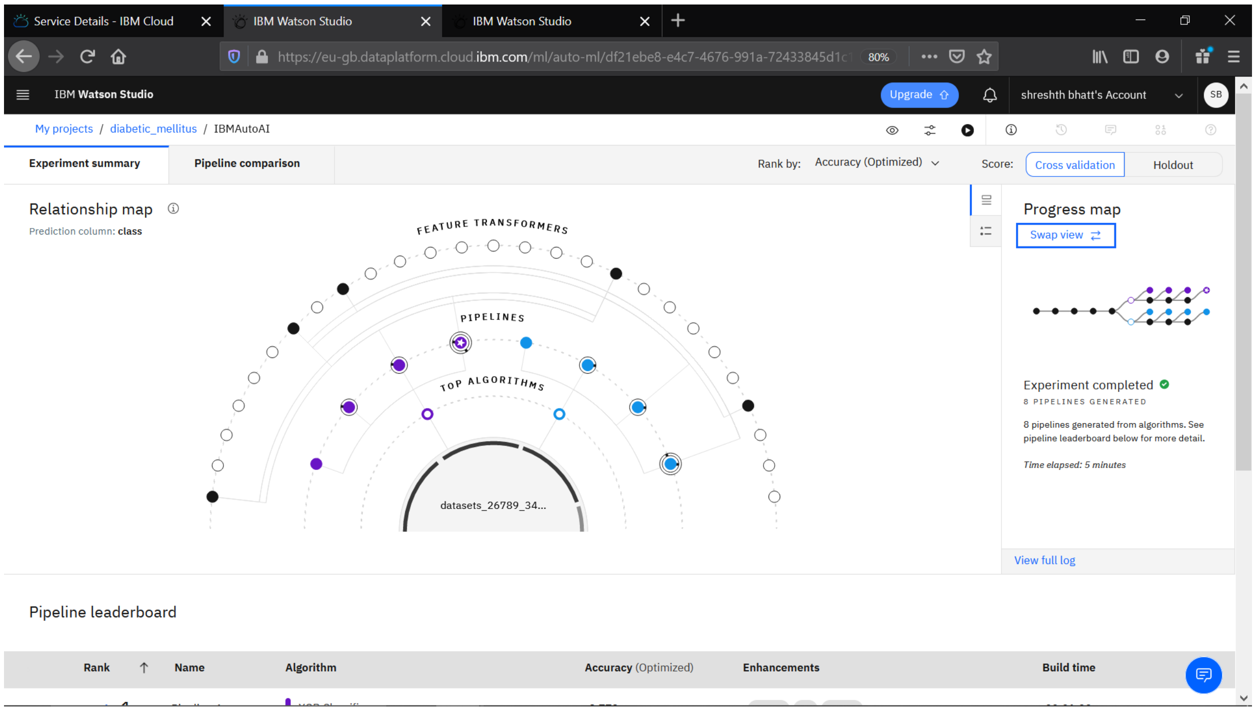
New AutoAI experiment
Define details
From blank
From sample
Name *
Name of AutoAI experiment
Description
Description of AutoAI experiment
Associate services
Watson Machine Learning Service Instance *
pm-20-wf
Compute configuration *
8 vCPU and 32 GB RAM
This compute configuration consumes 20 capacity units per hour. Learn more about capacity unit hours and Watson Machine Learning pricing plans.
Cancel
Create

Now, lets look at Experiment Summary:

Progress Map:



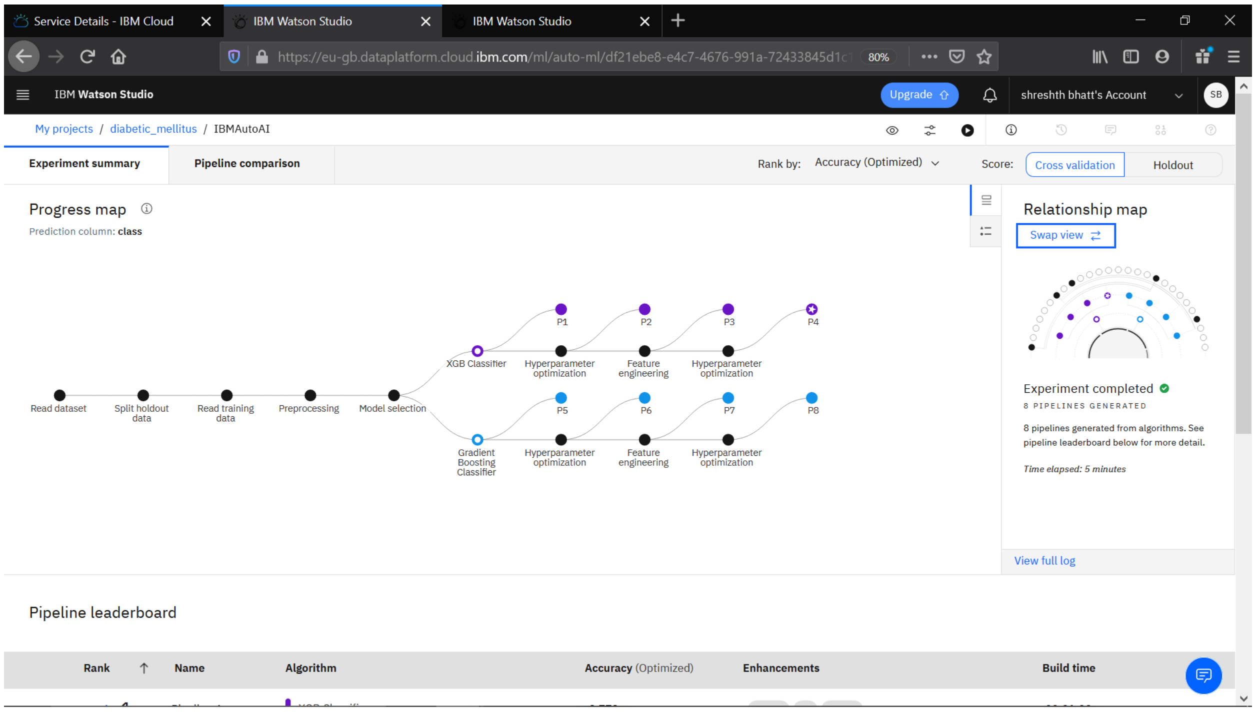
Experiment completed

8 PIPELINES GENERATED

8 pipelines generated from algorithms. See pipeline leaderboard below for more detail.

Time elapsed: 5 minutes

Relationship Map:



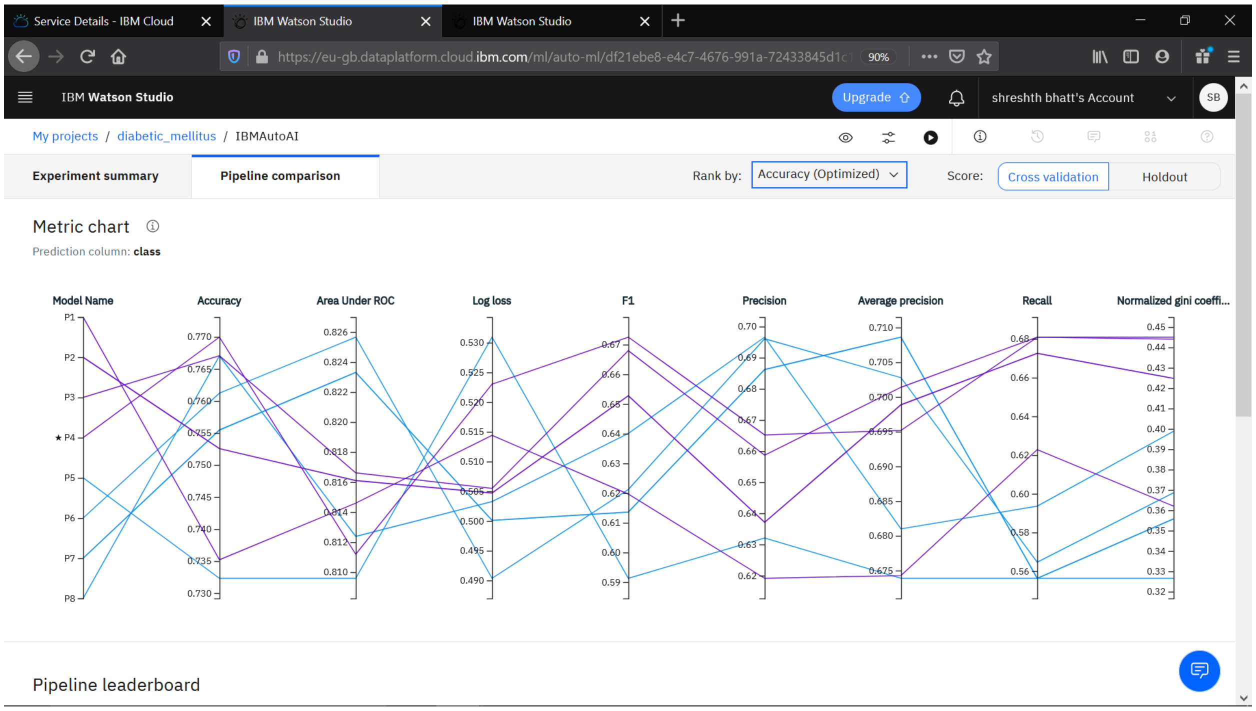
Experiment completed

8 PIPELINES GENERATED

8 pipelines generated from algorithms. See pipeline leaderboard below for more detail.

Time elapsed: 5 minutes

Pipeline comparison(Metric Chart):



My projects / diabetic_mellitus / IBMAutoAI

Experiment summary | Pipeline comparison

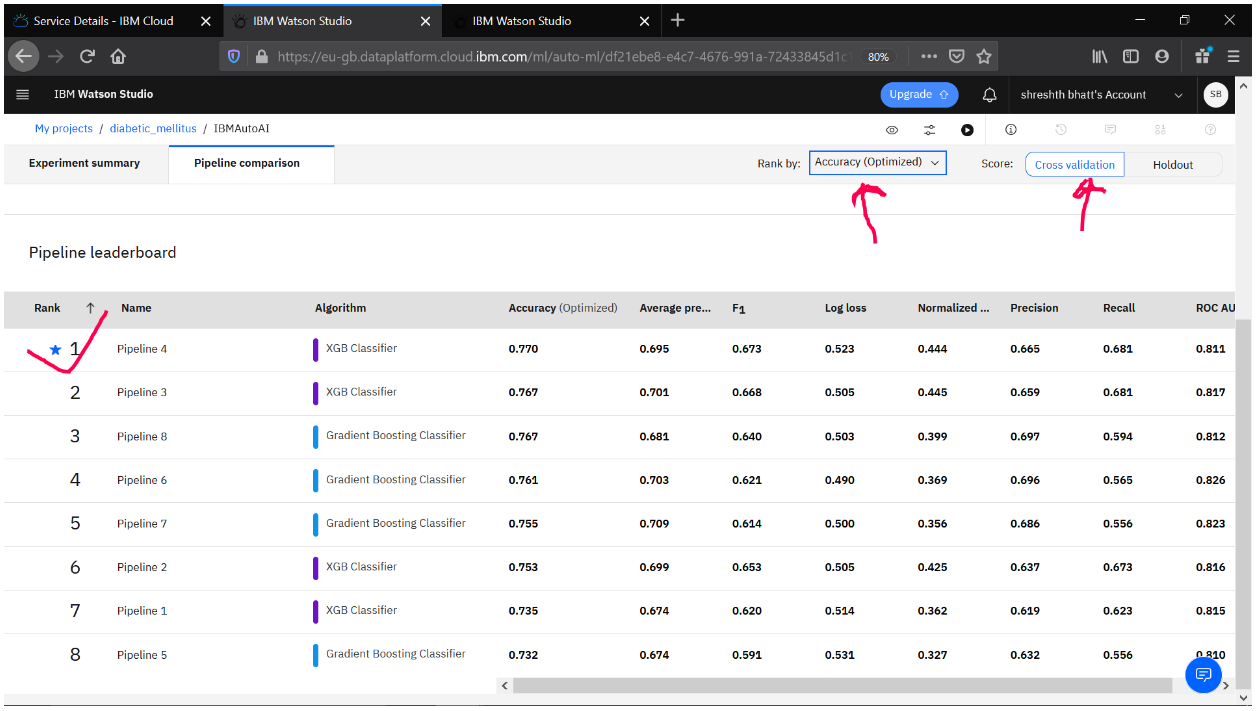
Rank by: Accuracy (Optimized) Score: Cross validation Holdout

Metric chart

Prediction column: **class**

Pipeline leaderboard

Pipeline Leadorboard:



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Experiment summary | Pipeline comparison

Rank by: Accuracy (Optimized) Score: Cross validation Holdout

Pipeline leaderboard

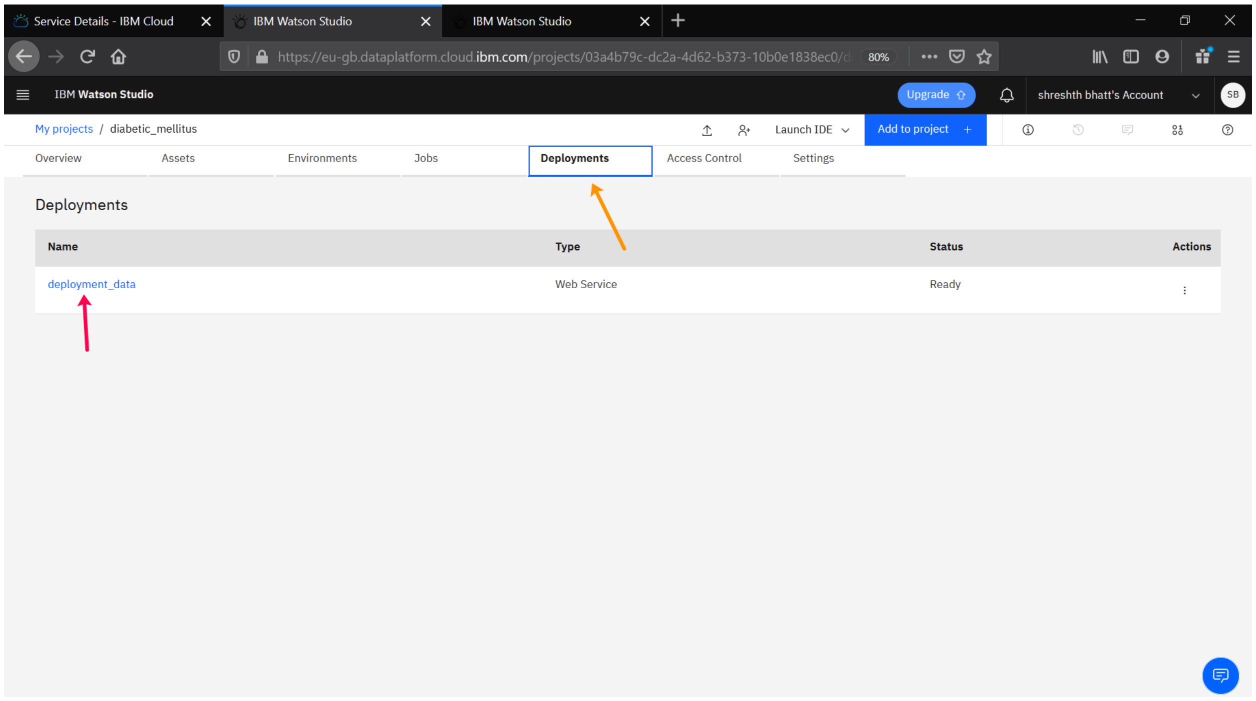
Rank ↑	Name	Algorithm	Accuracy (Optimized)	Average pre...	F1	Log loss	Normalized ...	Precision	Recall	ROC AU
★ 1	Pipeline 4	XGB Classifier	0.770	0.695	0.673	0.523	0.444	0.665	0.681	0.811
2	Pipeline 3	XGB Classifier	0.767	0.701	0.668	0.505	0.445	0.659	0.681	0.817
3	Pipeline 8	Gradient Boosting Classifier	0.767	0.681	0.640	0.503	0.399	0.697	0.594	0.812
4	Pipeline 6	Gradient Boosting Classifier	0.761	0.703	0.621	0.490	0.369	0.696	0.565	0.826
5	Pipeline 7	Gradient Boosting Classifier	0.755	0.709	0.614	0.500	0.356	0.686	0.556	0.823
6	Pipeline 2	XGB Classifier	0.753	0.699	0.653	0.505	0.425	0.637	0.673	0.816
7	Pipeline 1	XGB Classifier	0.735	0.674	0.620	0.514	0.362	0.619	0.623	0.815
8	Pipeline 5	Gradient Boosting Classifier	0.732	0.674	0.591	0.531	0.327	0.632	0.556	0.810

How many pipelines are generated in auto AI experiment in IBM?
By default, **AutoAI** will choose the top two performing algorithms of the ones it considers, and use that algorithm **to generate** 8 **pipelines** that you **can** view and compare, but you **can** change the number from 1 **to** 4.

What is scoring in machine learning?
Scoring is also called prediction, and is the process of generating values based on a trained **machine learning** model, given some new input data. The values or **scores** that are created can represent predictions of future values, but they might also represent a likely category or outcome.

Best Accuracy Score(optimised)	:	Pipeline 4
Algorithm used	:	XGB Classifier
Accuracy score	:	0.770

Now comes the Deployment Part :


Service Details - IBM Cloud | IBM Watson Studio | IBM Watson Studio

https://eu-gb.dataplatform.cloud.ibm.com/projects/03a4b79c-dc2a-4d62-b373-10b0e1838ec0/d

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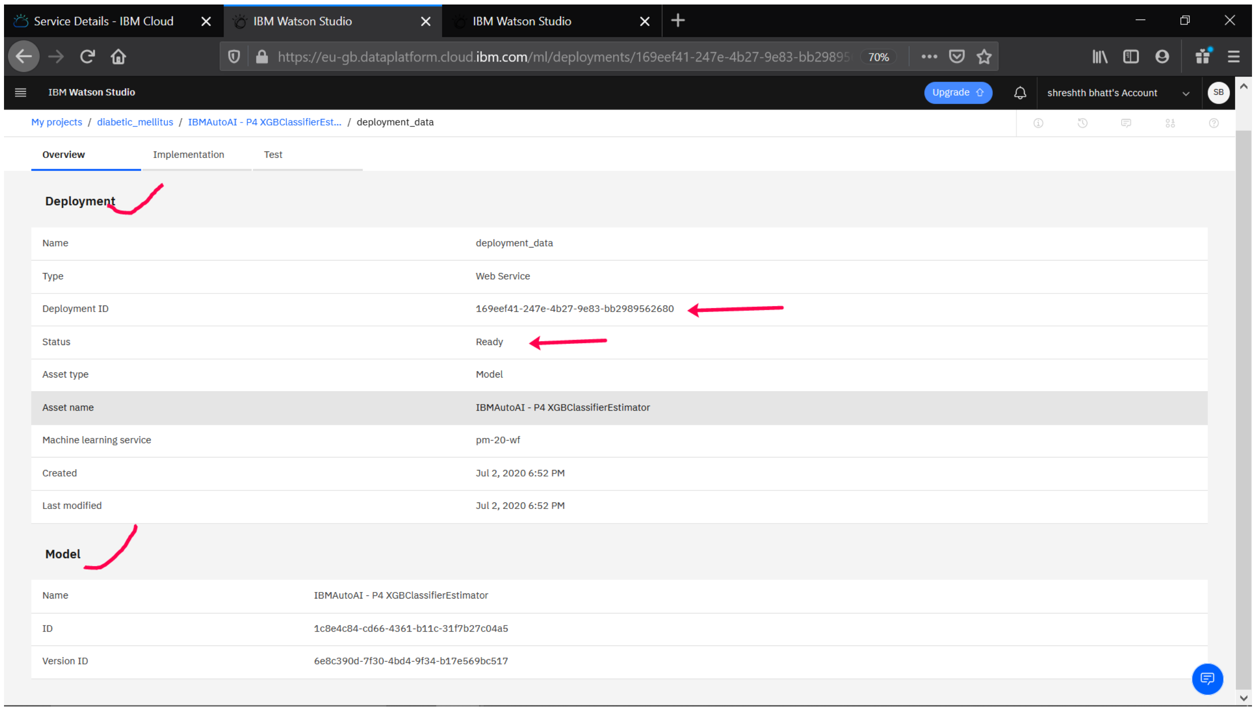
My projects / diabetic_mellitus | Launch IDE | Add to project

Overview | Assets | Environments | Jobs | **Deployments** | Access Control | Settings

Deployments

Name	Type	Status	Actions
deployment_data	Web Service	Ready	⋮

Here, as one can see that we ready to test our deployed model and all the credentials about the deployment model are given.


Service Details - IBM Cloud
IBM Watson Studio
IBM Watson Studio
https://eu-gb.dataplatform.cloud.ibm.com/ml/deployments/169eef41-247e-4b27-9e83-bb2989
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My projects / diabetic_mellitus / IBMAutoAI - P4 XGBClassifierEst... / deployment_data
Overview
Implementation
Test

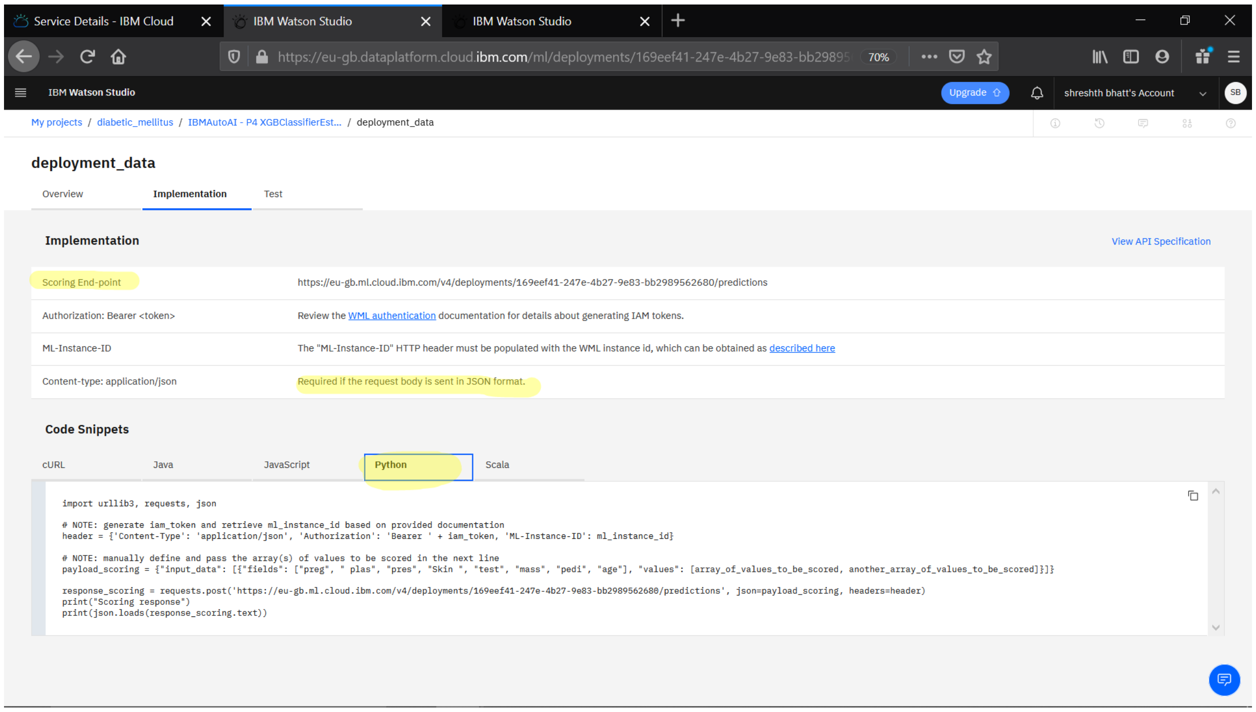
Deployment

Name	deployment_data
Type	Web Service
Deployment ID	169eef41-247e-4b27-9e83-bb2989562680
Status	Ready
Asset type	Model
Asset name	IBMAutoAI - P4 XGBClassifierEstimator
Machine learning service	pm-20-wf
Created	Jul 2, 2020 6:52 PM
Last modified	Jul 2, 2020 6:52 PM

Model

Name	IBMAutoAI - P4 XGBClassifierEstimator
ID	1c8e4c84-cd66-4361-b11c-31f7b27c04a5
Version ID	6e8c390d-7f30-4bd4-9f34-b17e569bc517

Here, under Implementation, useful information like Scoring End point URL, token,ML instance ID, payload scoring are given which are needed while creating Nodered UI application: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IBM Watson Studio
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https://eu-gb.dataplatform.cloud.ibm.com/ml/deployments/169eef41-247e-4b27-9e83-bb29895
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My projects / diabetic_mellitus / IBMAutoAI - P4 XGBClassifierEst... / deployment_data

deployment_data

Overview | Implementation | Test

Implementation

View API Specification

Scoring End-point	https://eu-gb.ml.cloud.ibm.com/v4/deployments/169eef41-247e-4b27-9e83-bb2989562680/predictions
Authorization: Bearer <token>	Review the WML authentication documentation for details about generating IAM tokens.
ML-Instance-ID	The "ML-Instance-ID" HTTP header must be populated with the WML instance id, which can be obtained as described here
Content-type: application/json	Required if the request body is sent in JSON format.

Code Snippets

cURL | Java | JavaScript | Python | Scala

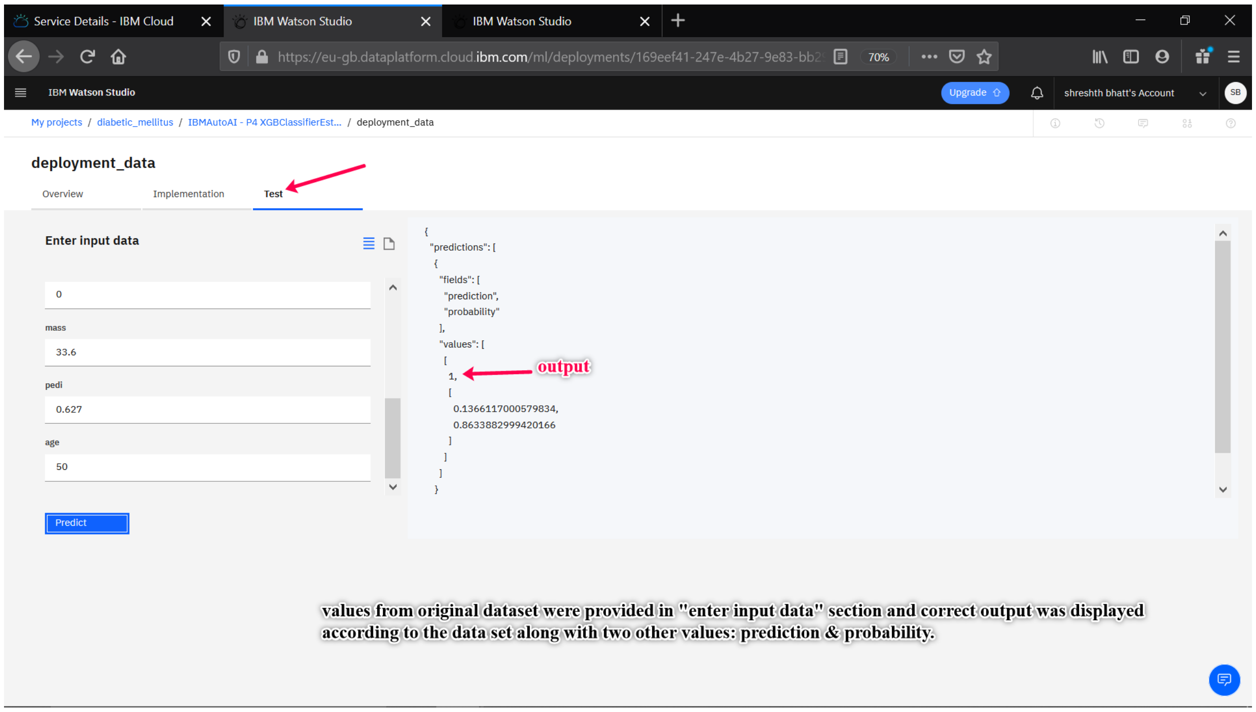
```
import urllib3, requests, json

# NOTE: generate iam_token and retrieve ml_instance_id based on provided documentation
header = {'Content-Type': 'application/json', 'Authorization': 'Bearer ' + iam_token, 'ML-Instance-ID': ml_instance_id}

# NOTE: manually define and pass the array(s) of values to be scored in the next line
payload_scoring = {"input_data": [{"fields": ["preg", " plas", "pres", "Skin ", "test", "mass", "pedi", "age"], "values": [array_of_values_to_be_scored, another_array_of_values_to_be_scored]}]}

response_scoring = requests.post('https://eu-gb.ml.cloud.ibm.com/v4/deployments/169eef41-247e-4b27-9e83-bb2989562680/predictions', json=payload_scoring, headers=header)
print("Scoring response")
print(json.loads(response_scoring.text))
```

Zoom the image to get the look at how predicted model gave the correct output when input was given as same as from the original dataset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https://eu-gb.dataplatform.cloud.ibm.com/ml/deployments/169eef41-247e-4b27-9e83-bb2
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SB
My projects / diabetic_mellitus / IBMAutoAI - P4 XGBClassifierEst... / deployment_data
Overview
Implementation
Test
Predict
output

deployment_data

Enter input data

	0
mass	33.6
pedi	0.627
age	50

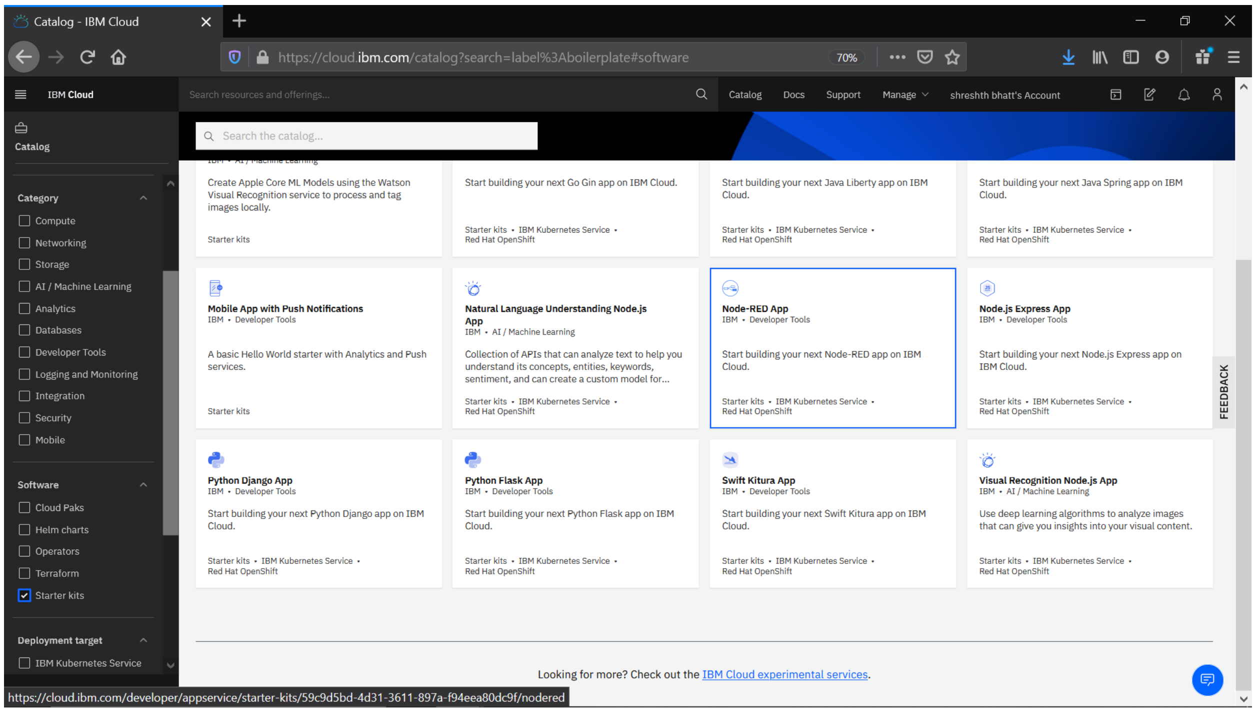
```
{
 "predictions": [
  {
   "fields": [
    "prediction",
    "probability"
   ],
   "values": [
    [
     1,
     [
      0.1366117000579834,
      0.8633882999420166
     ]
    ]
   ]
  }
```

values from original dataset were provided in "enter input data" section and correct output was displayed according to the data set along with two other values: prediction & probability.

And finally this is how I have created model using Auto AI experiment and output can be easily tested in the watson studio itself.

APPLICATION BUILDING

Step 1: Go to the catalog tab once again and install NODERED App


Catalog - IBM Cloud

https://cloud.ibm.com/catalog?search=label%3Aboilerplate#software

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Catalog

Search the catalog...

Category: Compute, Networking, Storage, AI / Machine Learning, Analytics, Databases, Developer Tools, Logging and Monitoring, Integration, Security, Mobile

Software: Cloud Paks, Helm charts, Operators, Terraform, [✓ Starter kits]

Deployment target: IBM Kubernetes Service

Create Apple Core ML Models using the Watson Visual Recognition service to process and tag images locally. Starter kits

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Natural Language Understanding Node.js App IBM • AI / Machine Learning — Collection of APIs that can analyze text to help you understand its concepts, entities, keywords, sentiment, and can create a custom model for... Starter kits • IBM Kubernetes Service • Red Hat OpenShift

Node-RED App IBM • Developer Tools — Start building your next Node-RED app on IBM Cloud. Starter kits • IBM Kubernetes Service • Red Hat OpenShift

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Visual Recognition Node.js App IBM • AI / Machine Learning — Use deep learning algorithms to analyze images that can give you insights into your visual content. Starter kits • IBM Kubernetes Service • Red Hat OpenShift

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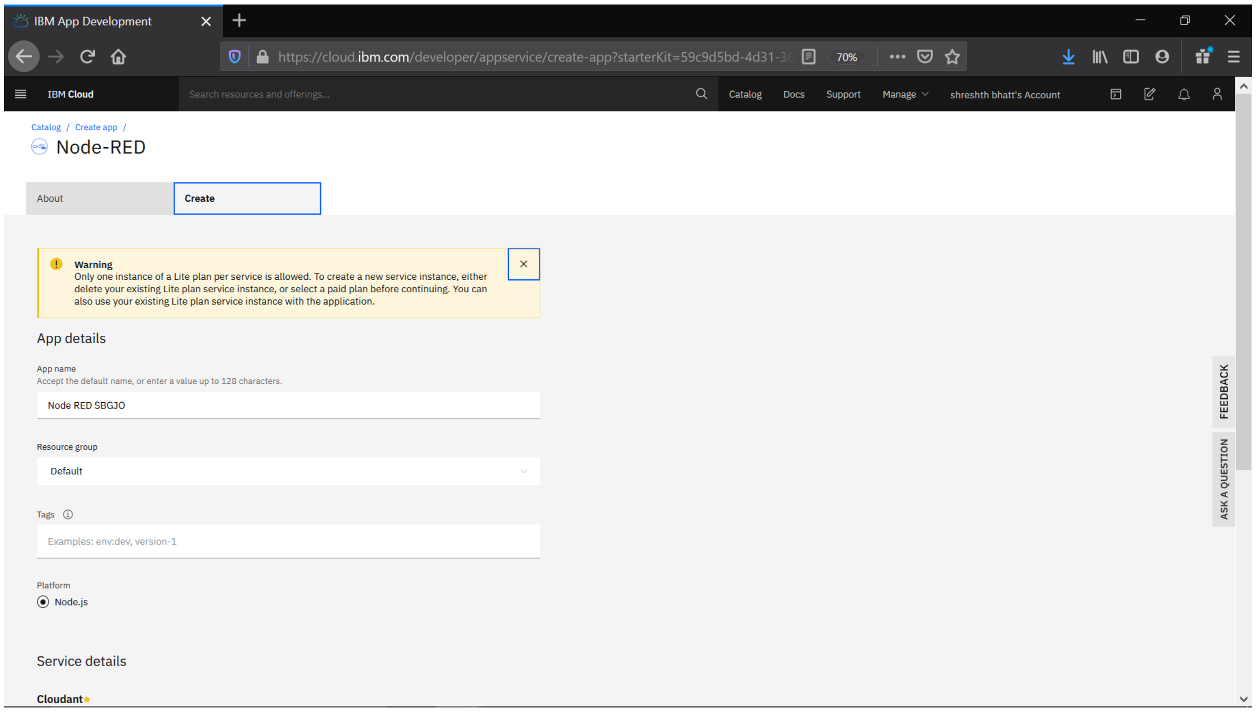
https://cloud.ibm.com/developer/appservice/starter-kits/59c9d5bd-4d31-3611-897a-f94eea80dc9f/nodered

STEP-2: Create the NODERED instance & this is How Node Red Service is started.


IBM App Development

https://cloud.ibm.com/developer/appservice/create-app?starterKit=59c9d5bd-4d31-3

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Catalog / Create app /

Node-RED

About | Create

Warning
Only one instance of a Lite plan per service is allowed. To create a new service instance, either delete your existing Lite plan service instance, or select a paid plan before continuing. You can also use your existing Lite plan service instance with the application.

App details

App name
Accept the default name, or enter a value up to 128 characters.
Node RED SBGJO

Resource group
Default

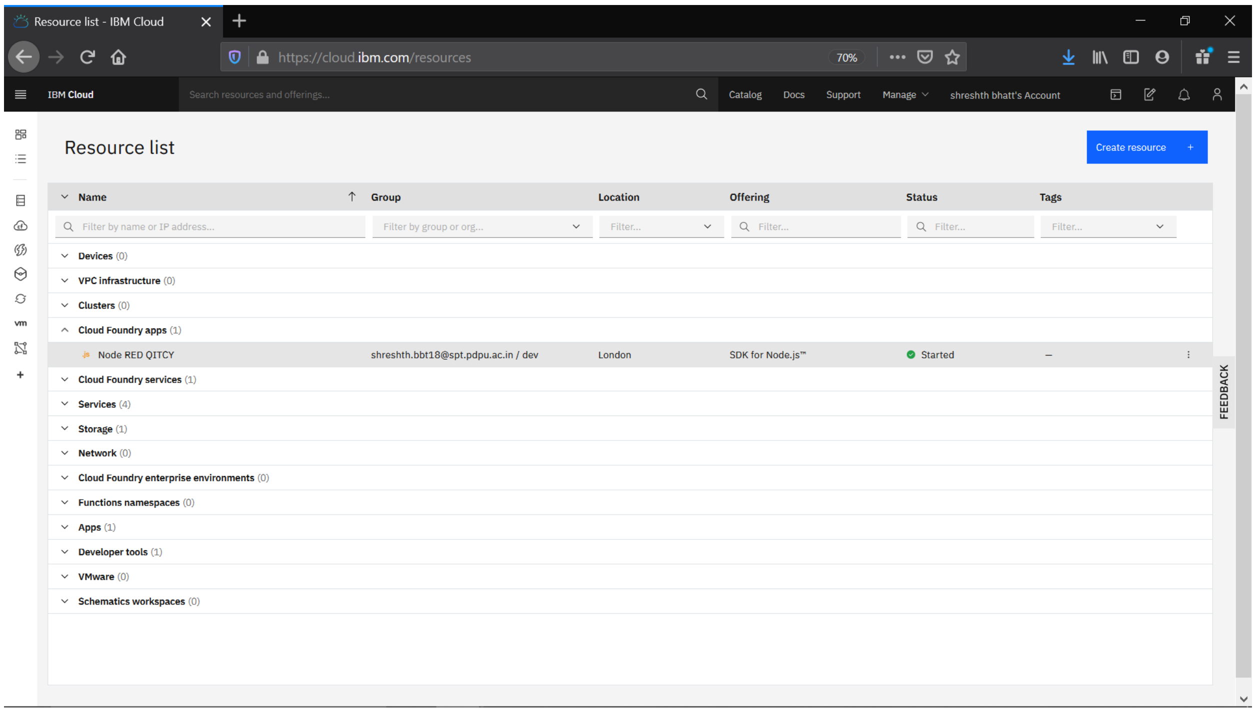
Tags
Examples: env:dev, version-1

Platform
[✓ Node.js]

Service details

Cloudant

STEP-3: Get Access to the NODERED app in IBM CLOUD Dashboard window under Cloud Foundry Apps Section.


Resource list - IBM Cloud
https://cloud.ibm.com/resources
70%
IBM Cloud
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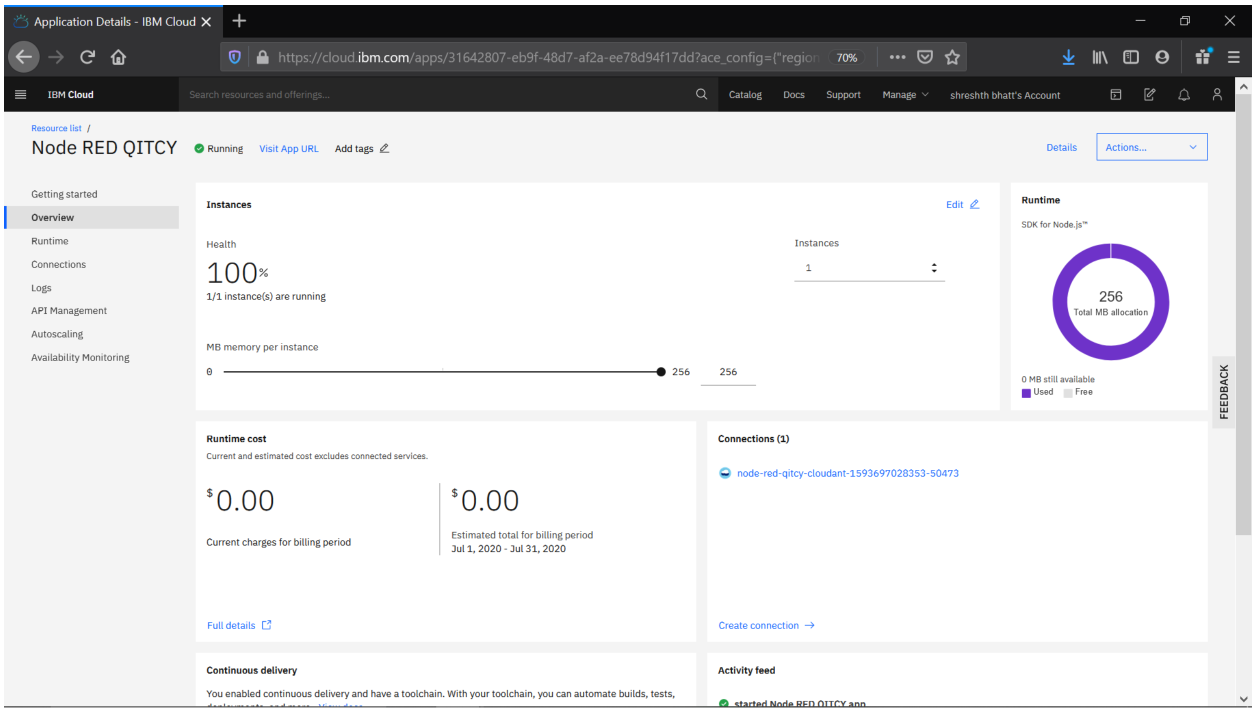
Create resource
FEEDBACK

Resource list

Name	Group	Location	Offering	Status	Tags
Devices (0)					
VPC infrastructure (0)					
Clusters (0)					
Cloud Foundry apps (1)					
Node RED QITCY	shreshth.bbt18@spt.pdpu.ac.in / dev	London	SDK for Node.js™	Started	–
Cloud Foundry services (1)					
Services (4)					
Storage (1)					
Network (0)					
Cloud Foundry enterprise environments (0)					
Functions namespaces (0)					
Apps (1)					
Developer tools (1)					
VMware (0)					
Schematics workspaces (0)					

STEP-4: Once App window opens, click on Visit App URL.



Node RED QITCY

Instances

Health

100%

1/1 instance(s) are running

Instances: 1

MB memory per instance: 0 — 256 — 256

Runtime

SDK for Node.js™

256 Total MB allocation

0 MB still available

Used Free

Runtime cost

Current and estimated cost excludes connected services.

$0.00 Current charges for billing period

$0.00 Estimated total for billing period Jul 1, 2020 - Jul 31, 2020

Full details

Connections (1)

node-red-qitcy-cloudant-1593697028353-50473

Create connection →

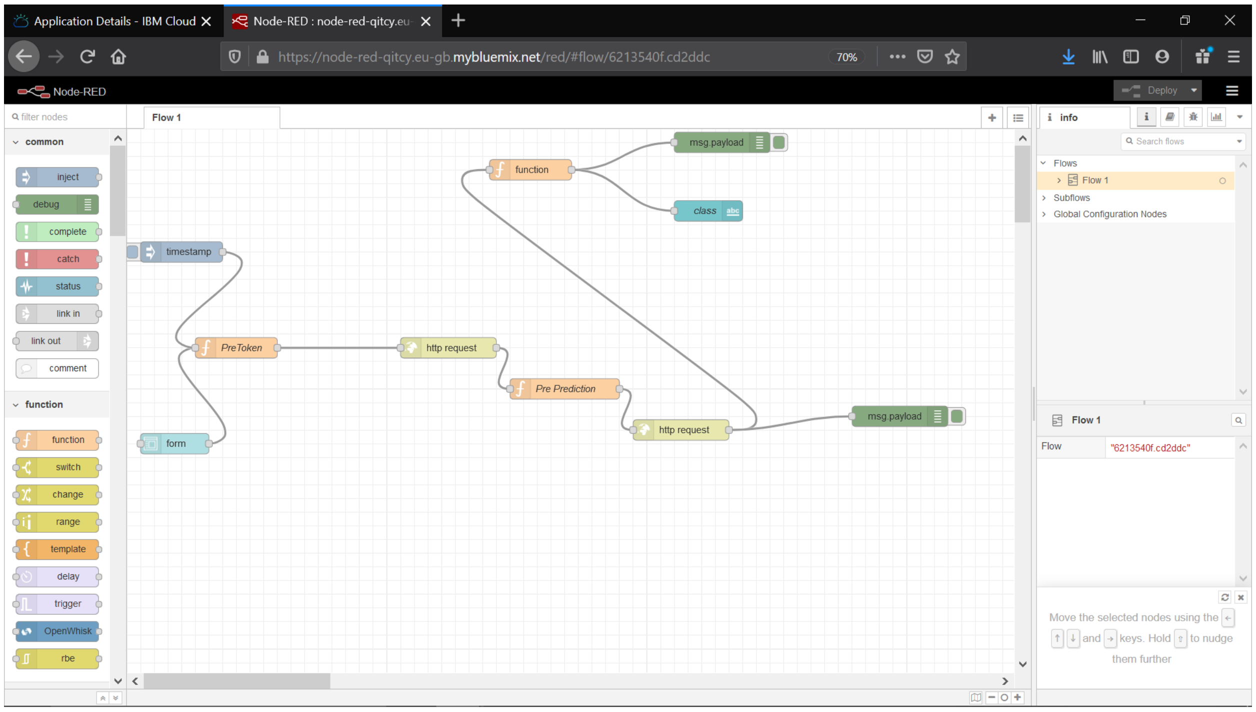
Continuous delivery

You enabled continuous delivery and have a toolchain. With your toolchain, you can automate builds, tests,

Activity feed

started Node RED QITCY app

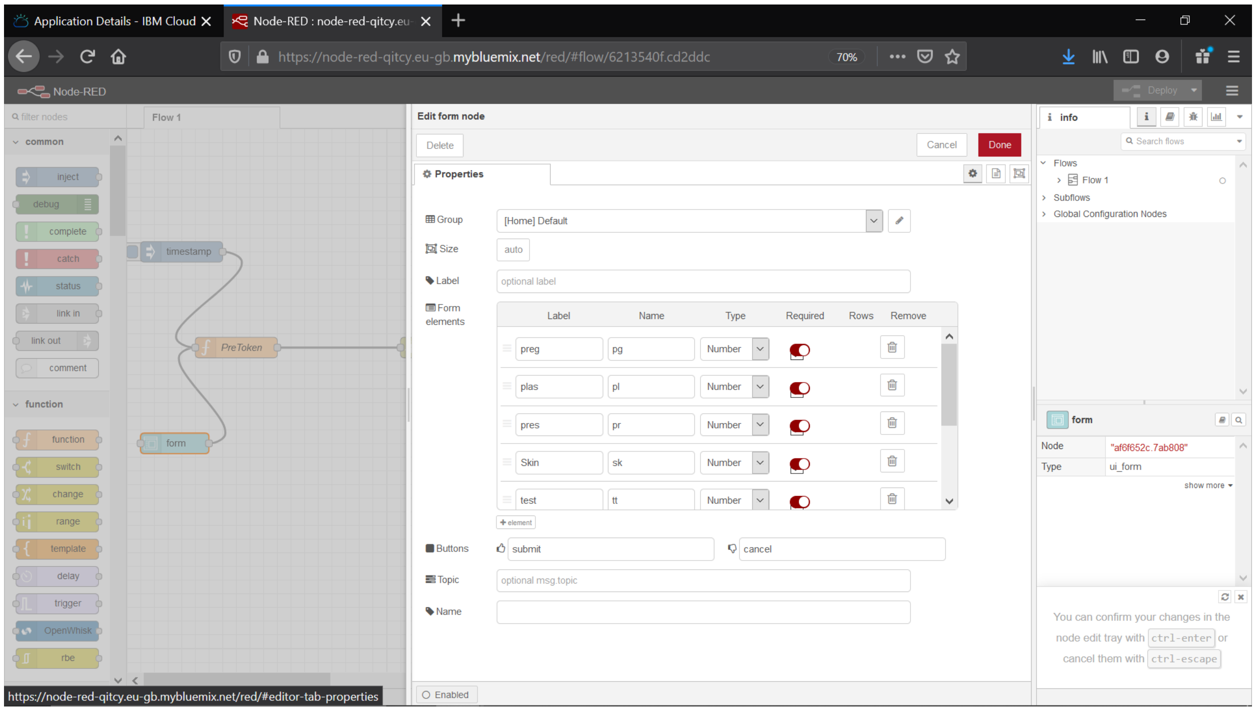
STEP-5: After the Step 4, NodeRed Editor window get open which has collection of predefined nodes installed and consists of debug,output and link to the User Interface.



after creating the nodered service and creating the app, now comes, installation of dashboard nodes which are needed to build an UI Web application.
So, here we go to the navigation button and then manage pallette from where we install the dashboard nodes.

Modification of Nodes according to our given model, I have concluded it through some steps using images.

FORM NODE



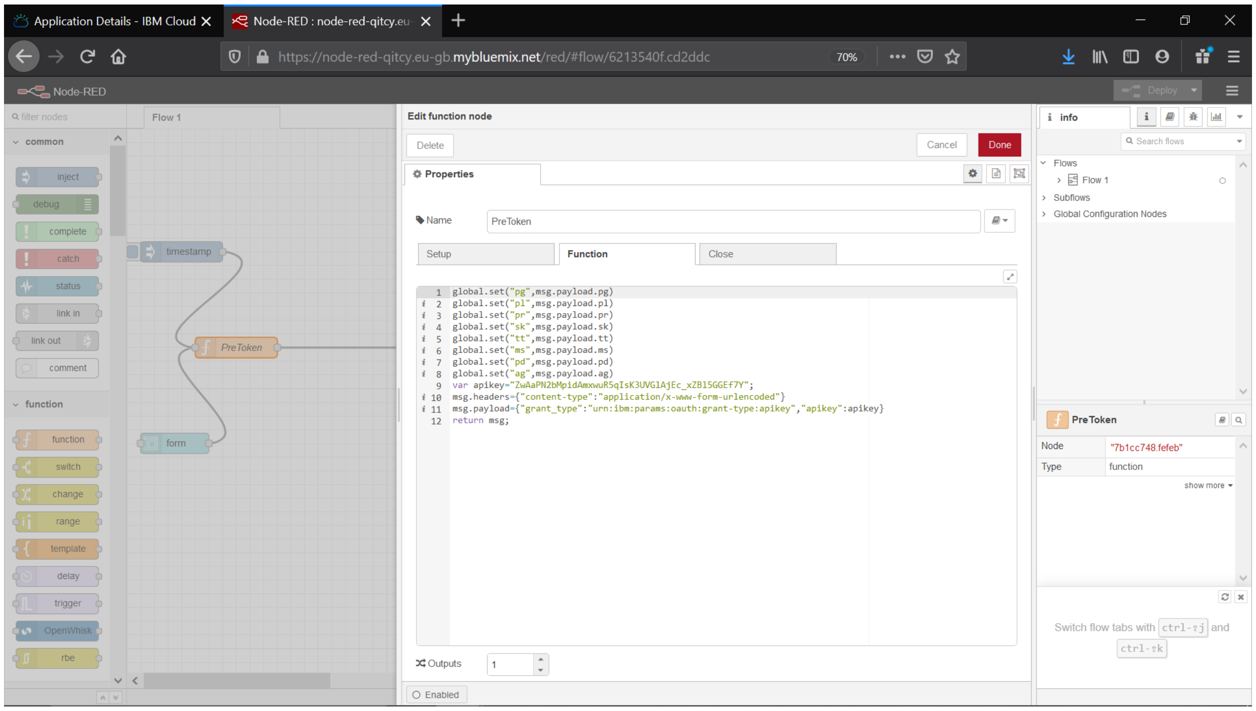
Edit form node

Label	Name	Type
preg	pg	Number
plas	pl	Number
pres	pr	Number
Skin	sk	Number
test	tt	Number

Group: [Home] Default
Size: auto
Buttons: submit, cancel

https://node-red-qitcy.eu-gb.mybluemix.net/red/#editor-tab-properties

PRE-TOKEN NODE



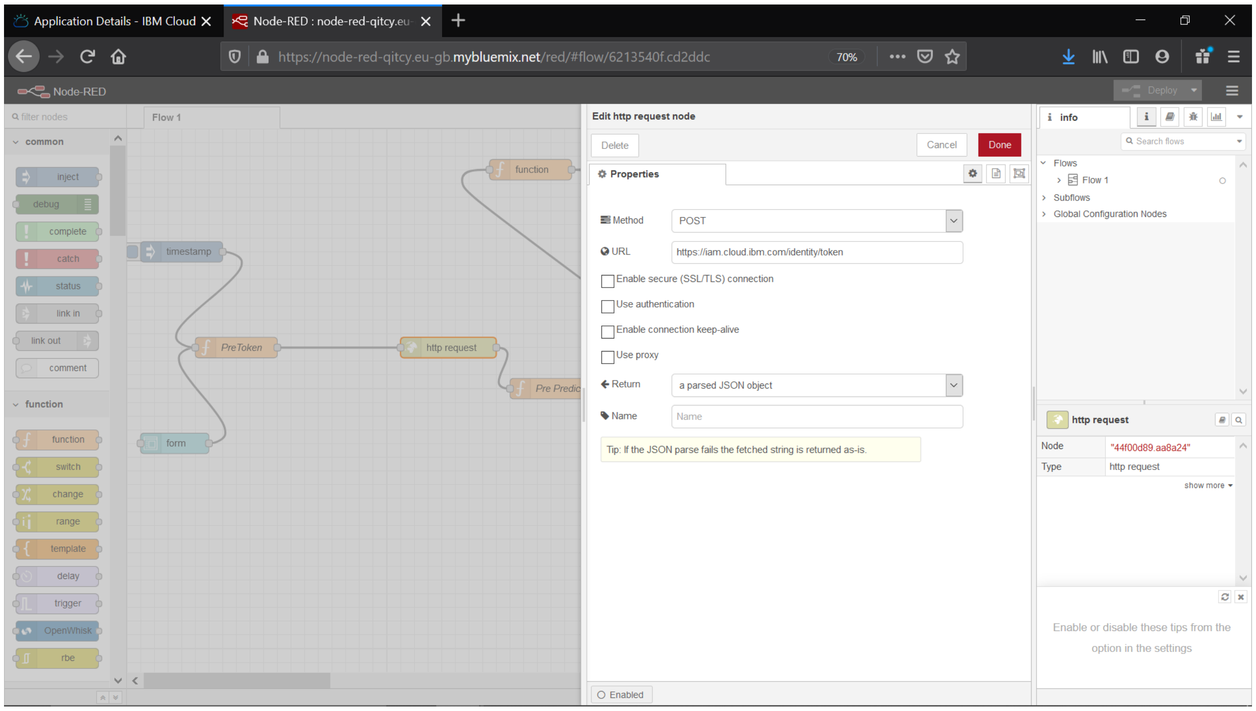
Edit function node

Name: PreToken

```
global.set("pg",msg.payload.pg)
global.set("pl",msg.payload.pl)
global.set("pr",msg.payload.pr)
global.set("sk",msg.payload.sk)
global.set("tt",msg.payload.tt)
global.set("ms",msg.payload.ms)
global.set("pd",msg.payload.pd)
global.set("ag",msg.payload.ag)
var apikey="ZwAaPN2bMpidAmxwuR5qIsK3UVGlAjEc_xZBl5GGEf7Y";
msg.headers={"content-type":"application/x-www-form-urlencoded"}
msg.payload={"grant_type":"urn:ibm:params:oauth:grant-type:apikey","apikey":apikey}
return msg;
```

Outputs: 1

TOKEN URL NODE



Edit http request node

Properties

Method: POST

URL: https://iam.cloud.ibm.com/identity/token

☐ Enable secure (SSL/TLS) connection

☐ Use authentication

☐ Enable connection keep-alive

☐ Use proxy

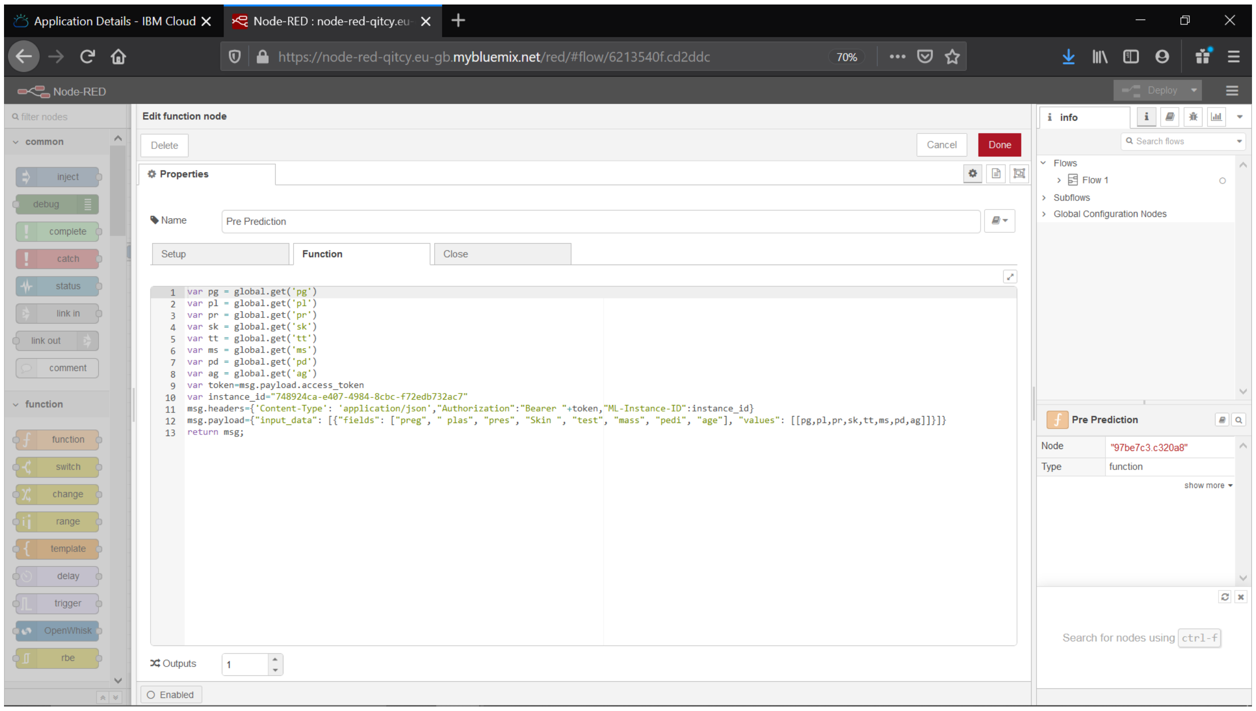
Return: a parsed JSON object

Name: Name

Tip: If the JSON parse fails the fetched string is returned as-is.

Node	"44f00d89.aa8a24"
Type	http request

PRE-PREDICTION NODE



Edit function node

Properties

Name: Pre Prediction

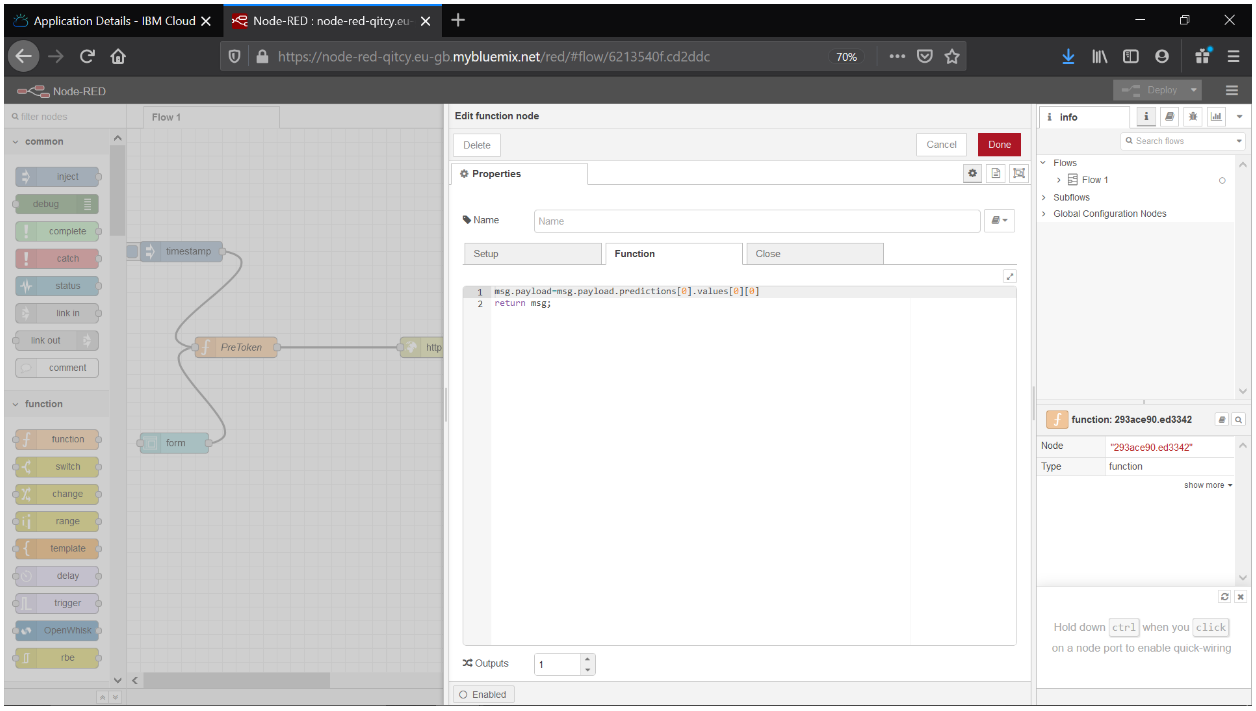
Setup | Function | Close

```
var pg = global.get('pg')
var pl = global.get('pl')
var pr = global.get('pr')
var sk = global.get('sk')
var tt = global.get('tt')
var ms = global.get('ms')
var pd = global.get('pd')
var ag = global.get('ag')
var token=msg.payload.access_token
var instance_id="748924ca-e407-4984-8cbc-f72edb732ac7"
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,pl,pr,sk,tt,ms,pd,ag]]}]}
return msg;
```

Outputs: 1

Node	"97be7c3.c320a8"
Type	function

FUNCTION NODE



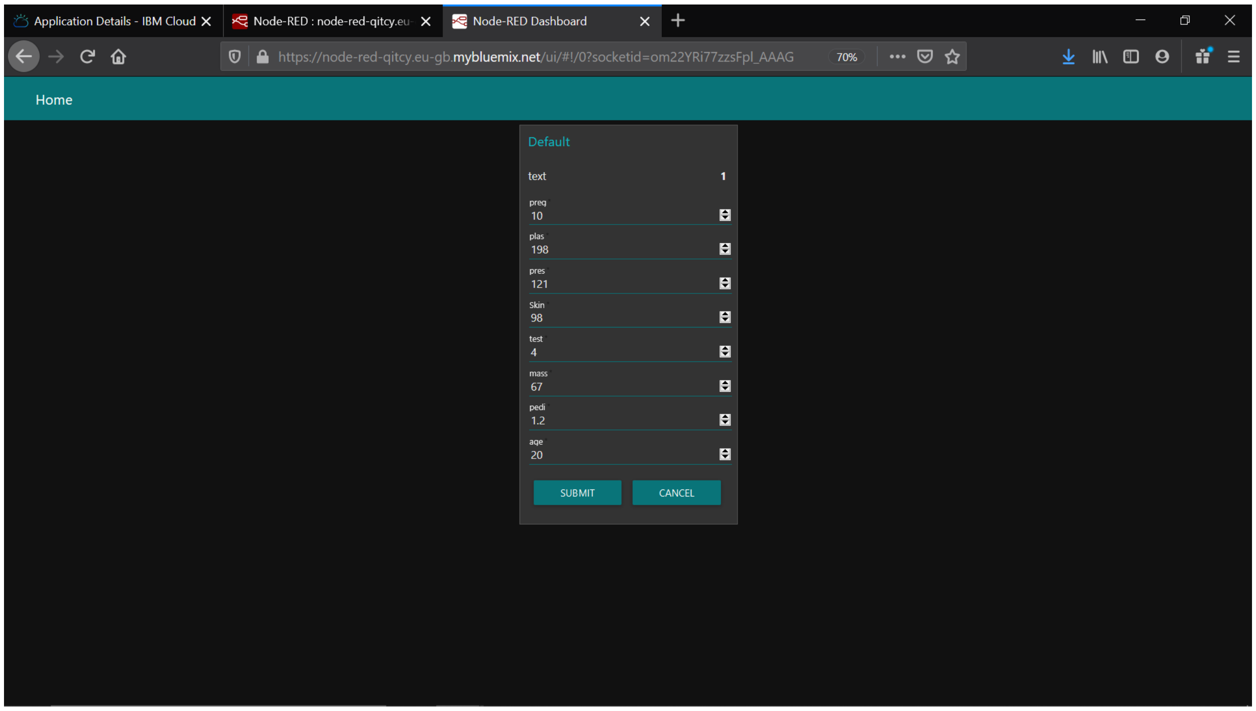
```
msg.payload=msg.payload.predictions[0].values[0][0]
return msg;
```

function: 293ace90.ed3342

Node	"293ace90.ed3342"
Type	function

Outputs: 1

UI NODERED WEB APPLICATION WITH OUR PREDICTION DATA INPUT


Application Details - IBM Cloud
Node-RED : node-red-qitcy.eu-
Node-RED Dashboard
https://node-red-qitcy.eu-gb.mybluemix.net/ui/#!/0?socketid=om22YRi77zzsFpl_AAAG
Home
Default
SUBMIT
CANCEL

text	1
preq	10
plas	198
pres	121
Skin	98
test	4
mass	67
pedi	1.2
age	20

CONCLUSION:

- **Predictive** analytics and **machine learning** go hand-in-hand, as **predictive** models typically include a **machine learning** algorithm. These models can be trained over time to respond to new data or values, delivering the results the business needs.
- Logistic Regression which comes under Supervised Learning is the algorithm used here as output was in binary and we know that binary classification can only predict such models.
- AI lifecycle management automates data preparation, model development and hyper parameter optimization as an end-to-end data science and *AI* development.
- Node-RED can speed up development time and make app development more accessible to coders and non-coders alike.

THANKS & CHEERS,

SHRESHTH BHATT

(RSIP- CAREER BASIC ML100)