1. INTRODUCTION

1.1 Overview

Kidney is one of the most important body organs that filtrates all the wastes and water from human body to make urine. A global health problem which is steadily growing is Chronic kidney disease (CKD).Chronic Kidney Disease (CKD) is a major medical problem and can be cured if treated it in the early stages. Usually, people are not aware that medical tests, we take for different purposes could contain valuable information concerning kidney diseases.

1.2 Purpose

The purpose of this project is to suggest a solution through which the kidney disease can be analyzed and future requirements can be predicted. This will help to allocate essential resources efficiently to meet the need of the future.

2. LITERATURE SURVEY

2.1 Existing Problem

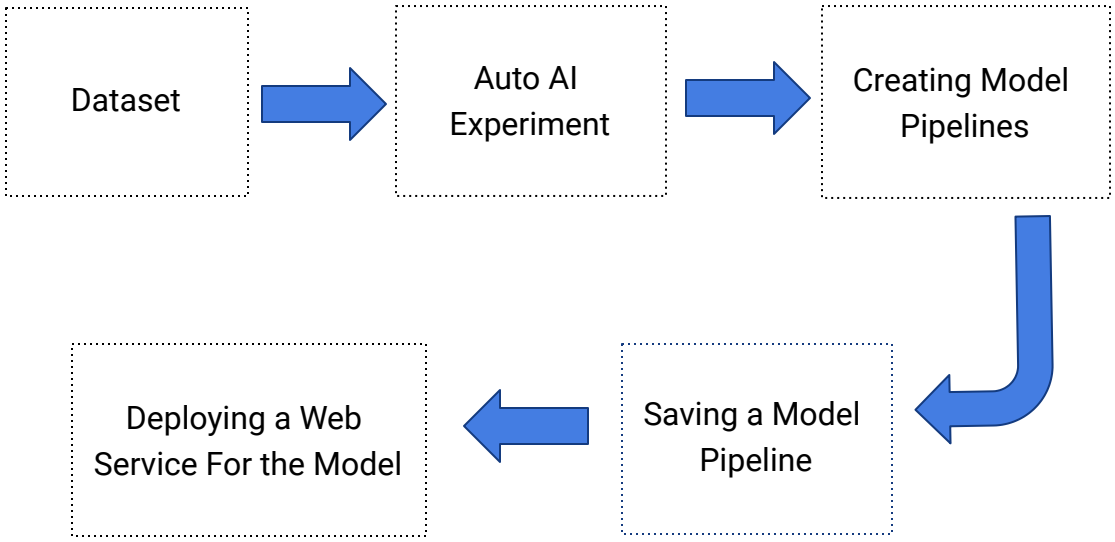
Usually, people are not aware that medical tests, we take for different purposes could contain valuable information concerning kidney diseases. Consequently, attributes of various medical tests are investigated to distinguish which attributes may contain helpful information about the disease.The information says that it helps us to measure the severity of the problem, the predicted survival of the patient after the illness, the pattern of the disease and work for curing the disease.

2.2 Proposed solution

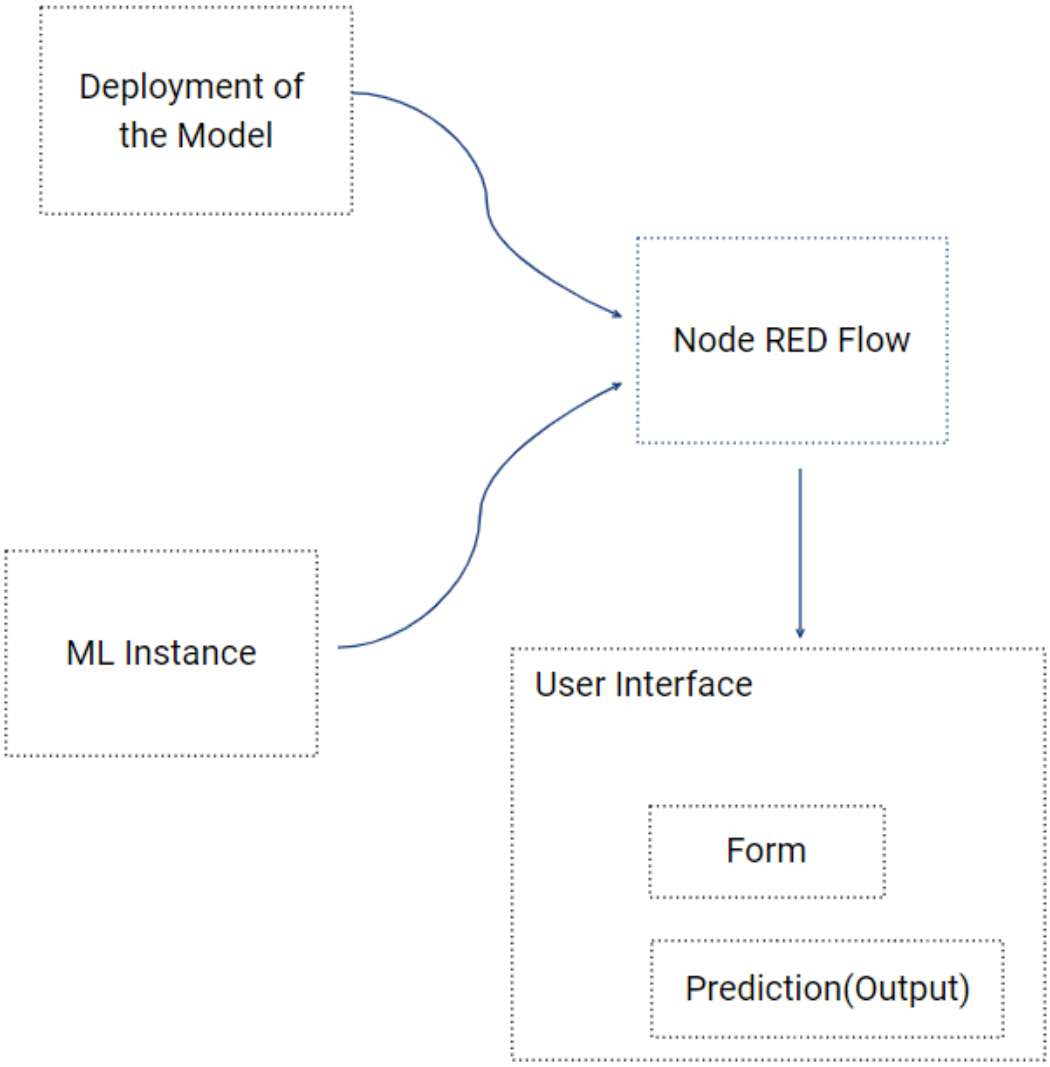
The main aim of this project is to create an appropriate machine learning model to analyze and predict kidney disease using IBM Watson, AutoAI Machine Learning Service. The model is deployed on IBM cloud to get scoring end point which will be used as API in mobile apps or web app building. We will develop a web application using node red service. We will use the scoring end point to give user input values to the deployed model. The model prediction will be showcased on User Interface.

3.THEORETICAL ANALYSIS

3.1 Block Diagram



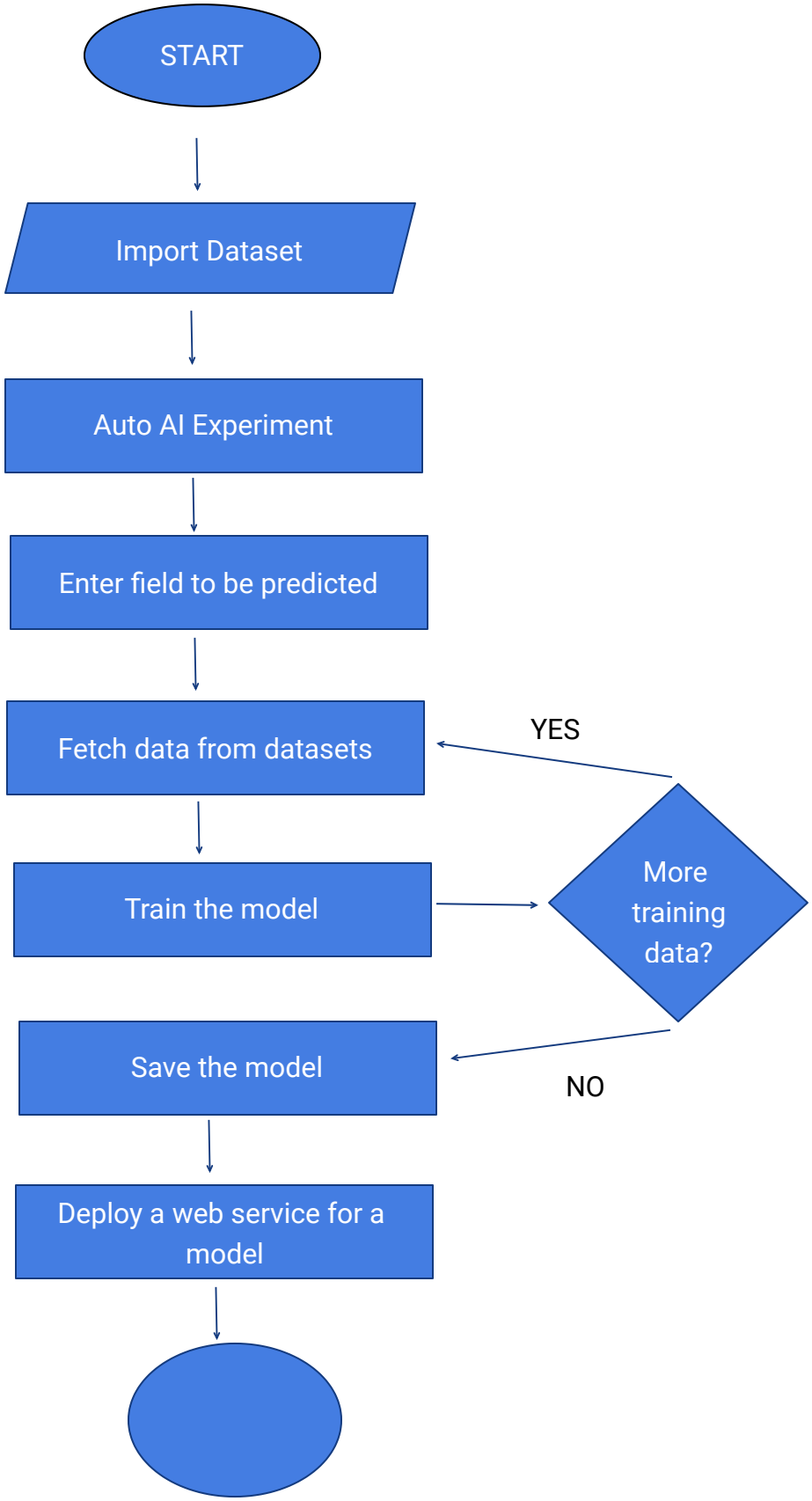
3.2 Software Designing



4. EXPERIMENTAL INVESTIGATIONS

These Dataset consists of prediction of Kidney Disease in world. This was recorded for people in the world along with the population . These data gives an idea of the chronic kidney disease Patient in the world . Requrements of this model depending upon its demography and can be used to learn the requirement trends.

5. FLOW CHART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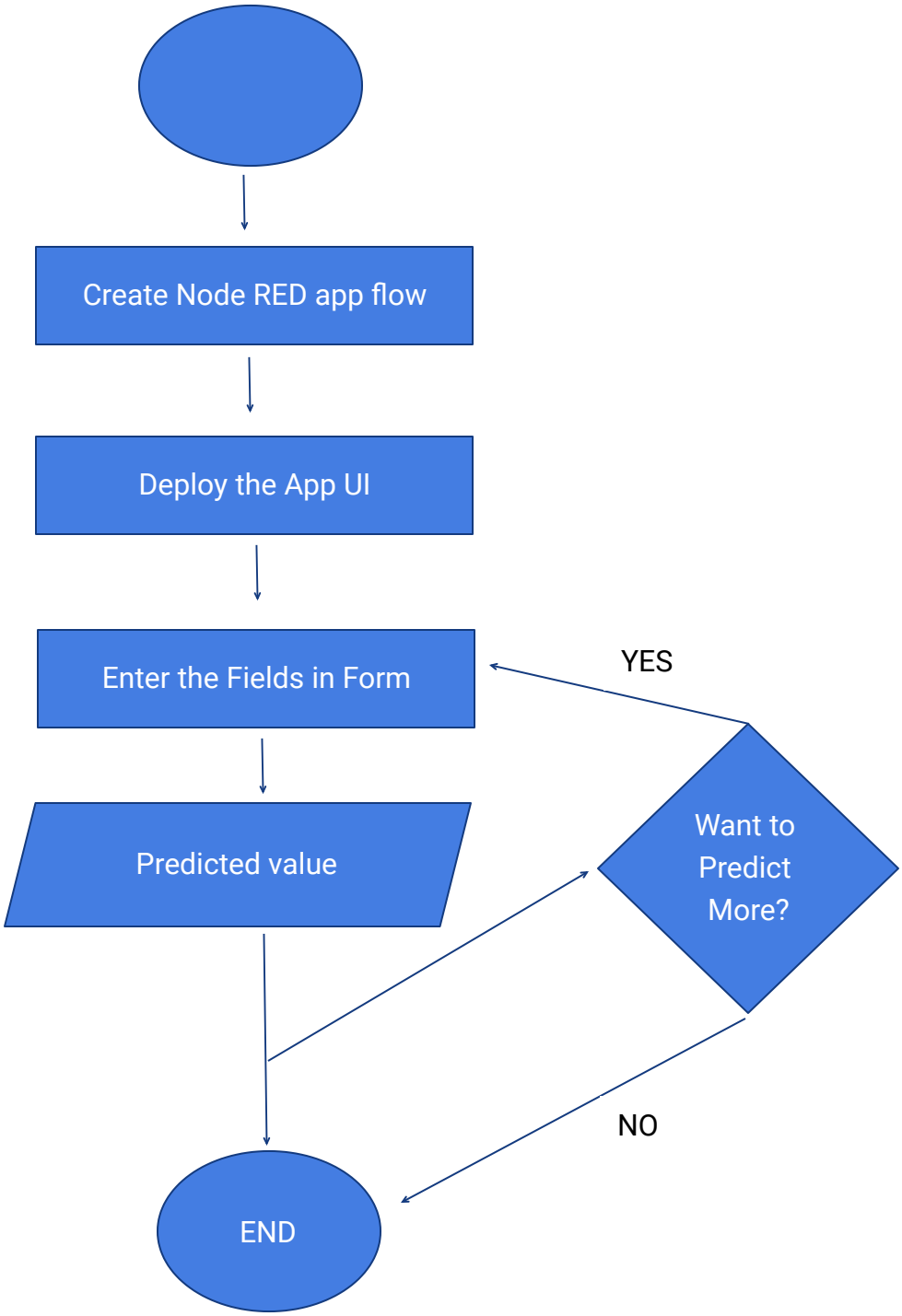
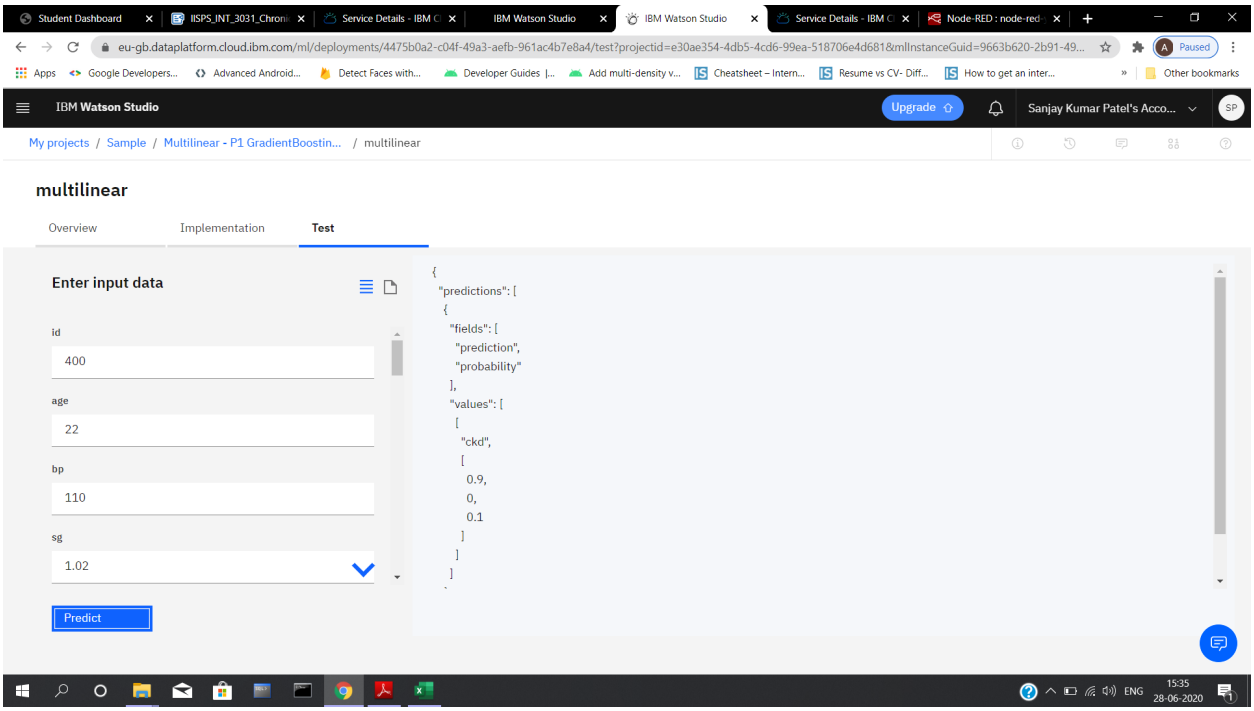
Import Dataset
Auto AI Experiment
Enter field to be predicted
Fetch data from datasets
YES
Train the model
More training data?
Save the model
NO
Deploy a web service for a model



6. Result

The model formed using auto AI services in IBM Watson studio can be used to predict the kidney disease in human body. It is based on populations. The Node RED app gives an User-Friendly interface to input the value and get prediction.



7. Advantages and Disadvantages

Advantages

1. The prediction gives good insights about the risk of kidney disease in the body.
2. With the help of this UI, Efficient prediction of kidney disease that can be done in a easy way.

Disadvantages

1. The model may need to be re-trained in case of decrementation of patients.
2. Many times we do face a situation where we find an imbalance in data which leads to poor accuracy of models.

8. APPLICATION

This solution can be used by health departments to reduce the kidney disease patients in the world, and analysing the data of patients.

9. CONCLUSION

The model is deployed successfully and was used to build a web UI using Node RED

services.The model gave satisfactory results and the Web UI is working properly.

10. FUTURE SCOPE

The solution can be improved for more heurestic analysis and can be further extended to predict more detailed requirements in future. These model will be more helpfull to predict and analysing the chronic kidney disease patients according to growing up of the populations in the world.

11. BIBILOGRAPHY

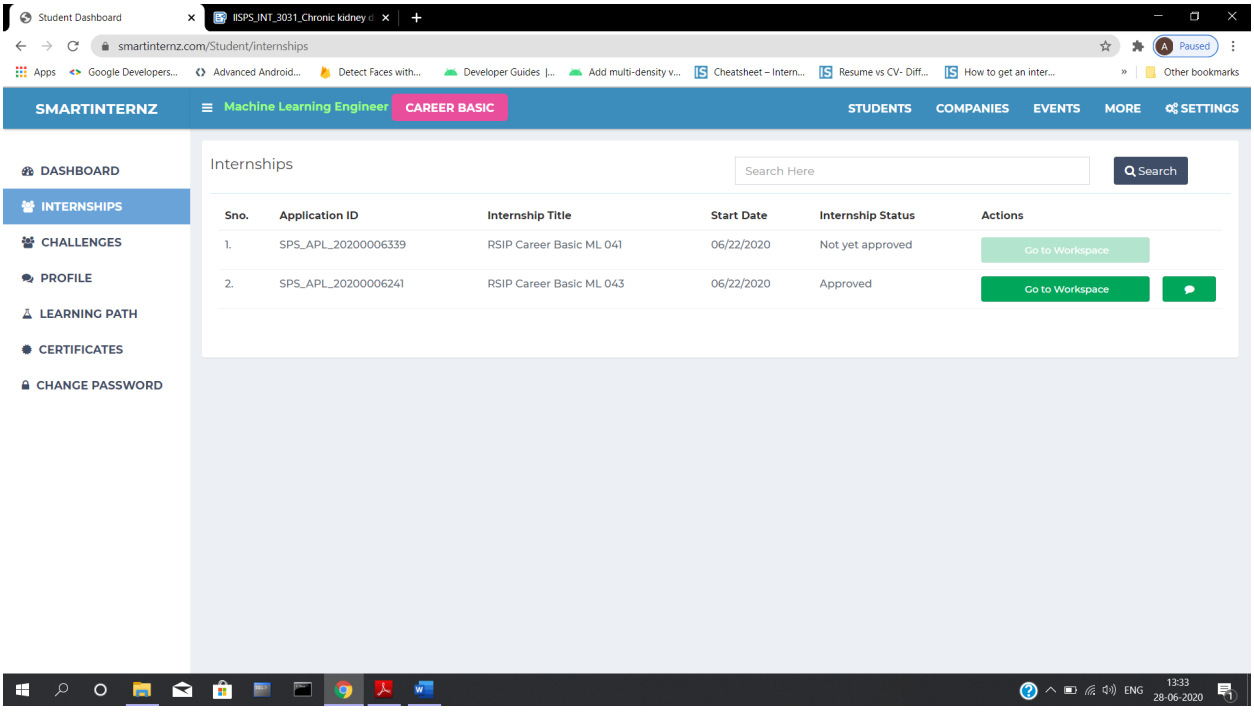
Source of Dataset

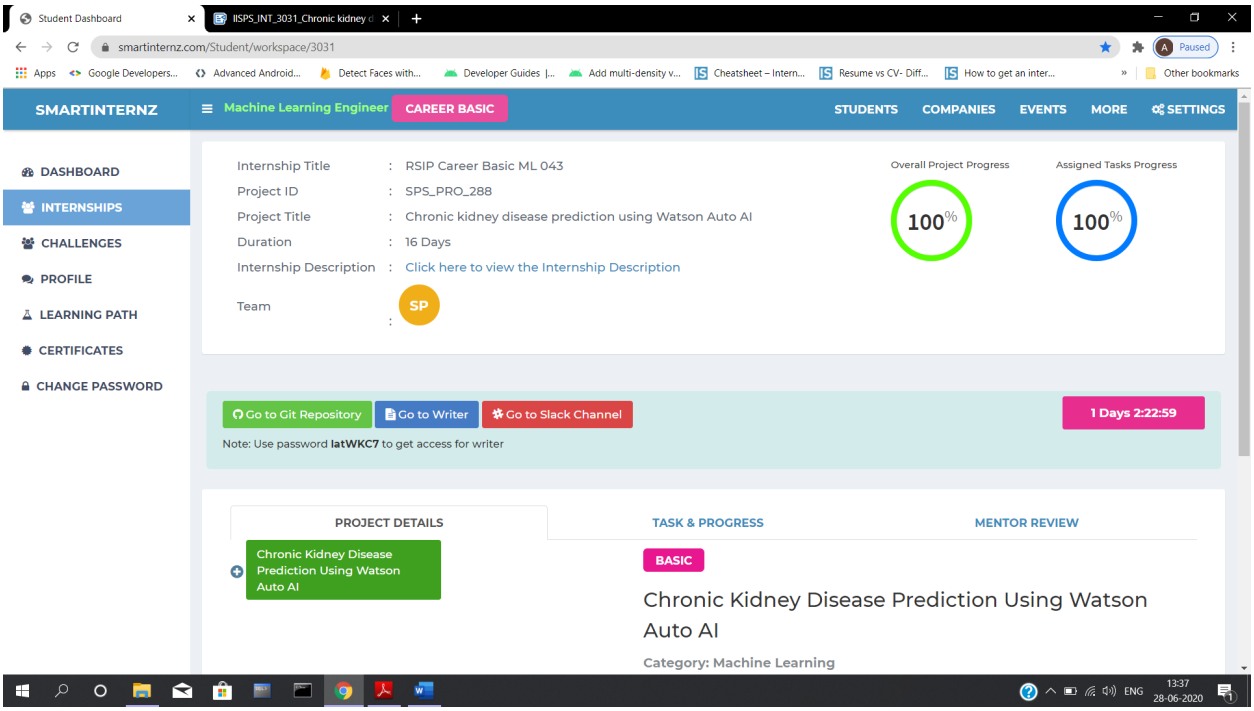
https://www.kaggle.com/mansoordaku/ckdisease

12. APPENDIX

SCREENSHOT

A1 Internship Project




Student Dashboard
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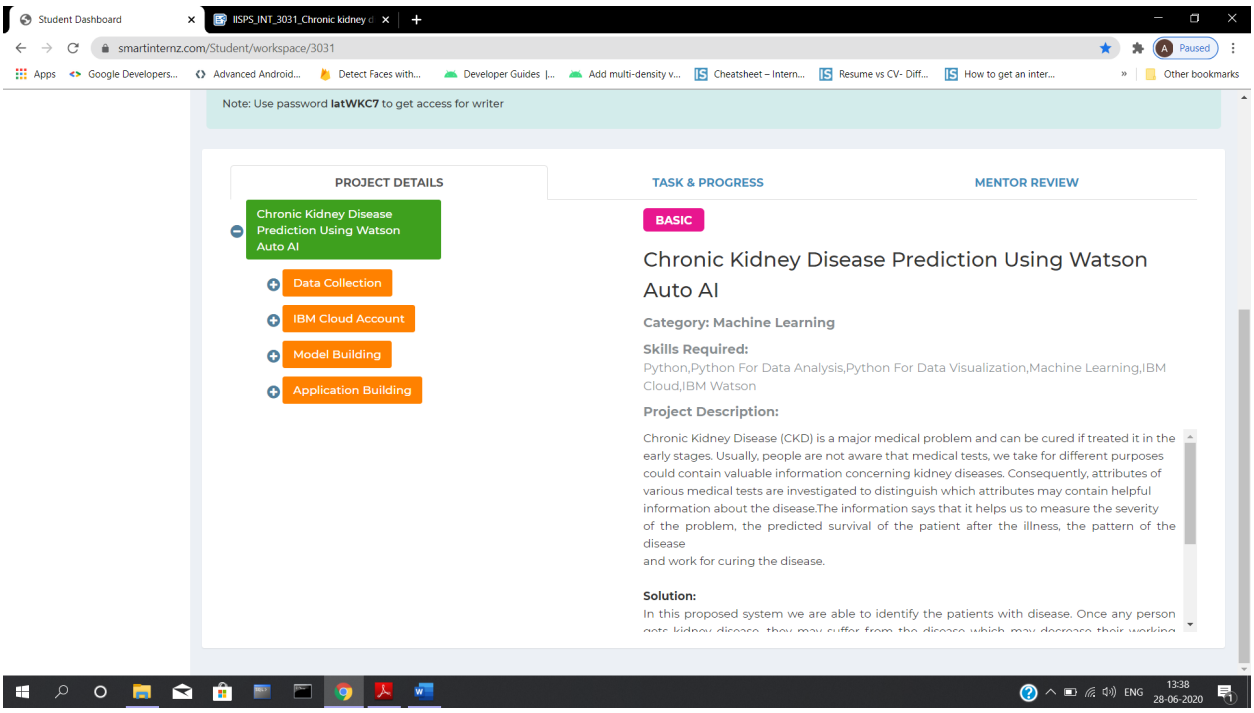
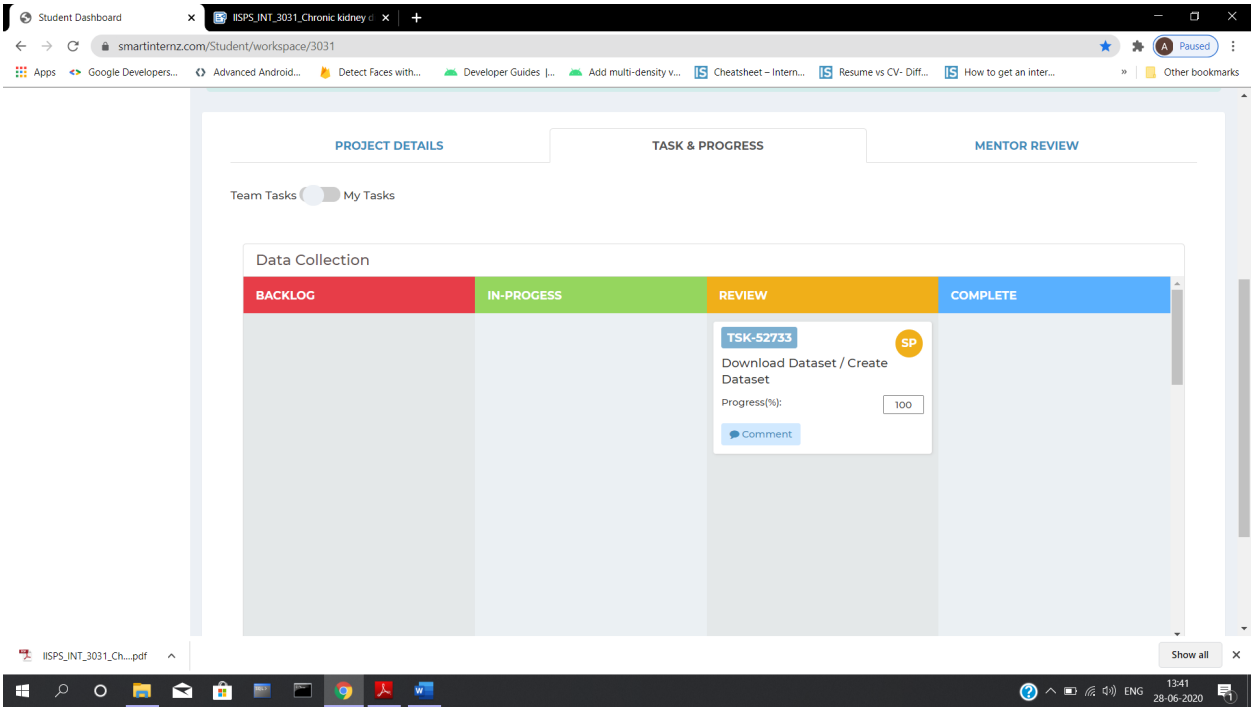
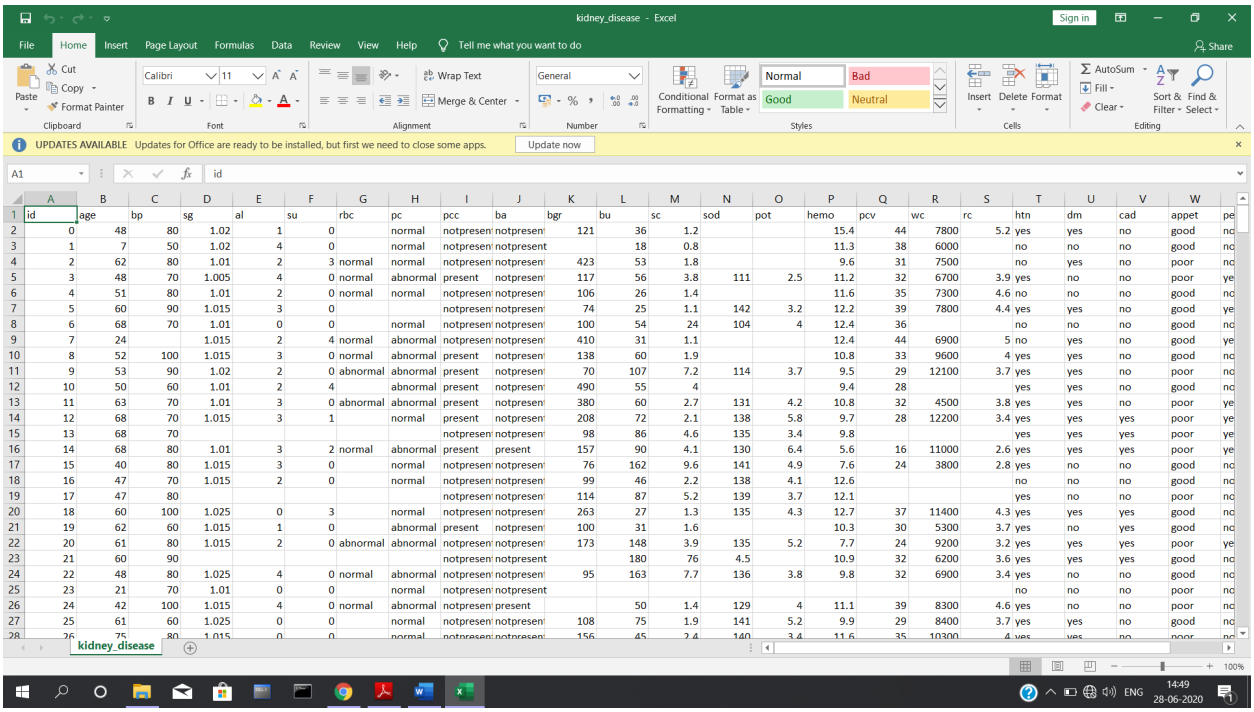
smartinternz.com/Student/workspace/3031
SMARTINTERNZ
Machine Learning Engineer
CAREER BASIC
STUDENTS
COMPANIES
EVENTS
MORE
SETTINGS
DASHBOARD
INTERNSHIPS
CHALLENGES
PROFILE
LEARNING PATH
CERTIFICATES
CHANGE PASSWORD
Internship Title : RSIP Career Basic ML 043
Project ID : SPS_PRO_288
Project Title : Chronic kidney disease prediction using Watson Auto AI
Duration : 16 Days
Internship Description : Click here to view the Internship Description
Team :
SP
Overall Project Progress
100%
Assigned Tasks Progress
100%
Go to Git Repository
Go to Writer
Go to Slack Channel
1 Days 2:22:59
Note: Use password latWKC7 to get access for writer
PROJECT DETAILS
TASK & PROGRESS
MENTOR REVIEW
Chronic Kidney Disease Prediction Using Watson Auto AI
BASIC
Chronic Kidney Disease Prediction Using Watson Auto AI
Category: Machine Learning


Student Dashboard
IISPS_INT_3031_Chronic kidney
smartinternz.com/Student/workspace/3031
Note: Use password latWKC7 to get access for writer
PROJECT DETAILS
TASK & PROGRESS
MENTOR REVIEW
Chronic Kidney Disease Prediction Using Watson Auto AI
Data Collection
IBM Cloud Account
Model Building
Application Building
BASIC
Chronic Kidney Disease Prediction Using Watson Auto AI
Category: Machine Learning
Skills Required:
Python,Python For Data Analysis,Python For Data Visualization,Machine Learning,IBM Cloud,IBM Watson
Project Description:
Chronic Kidney Disease (CKD) is a major medical problem and can be cured if treated it in the early stages. Usually, people are not aware that medical tests, we take for different purposes could contain valuable information concerning kidney diseases. Consequently, attributes of various medical tests are investigated to distinguish which attributes may contain helpful information about the disease.The information says that it helps us to measure the severity of the problem, the predicted survival of the patient after the illness, the pattern of the disease
and work for curing the disease.
Solution:
In this proposed system we are able to identify the patients with disease. Once any person





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1	7	50	1.02	4	0		normal	notpresen	notpresent		18	0.8			11.3	38	6000		no	no	no	good	no
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4	51	80	1.01	2	0	normal	normal	notpresen	notpresen	106	26	1.4			11.6	35	7300	4.6	no	no	no	good	no
5	60	90	1.015	3	0			notpresen	notpresen	74	25	1.1	142	3.2	12.2	39	7800	4.4	yes	yes	no	good	no
6	68	70	1.01	0	0		normal	notpresen	notpresen	100	54	24	104	4	12.4	36			no	no	no	good	no
7	24		1.015	2	4	normal	abnormal	notpresen	notpresen	410	31	1.1			12.4	44	6900	5	no	yes	no	good	ye
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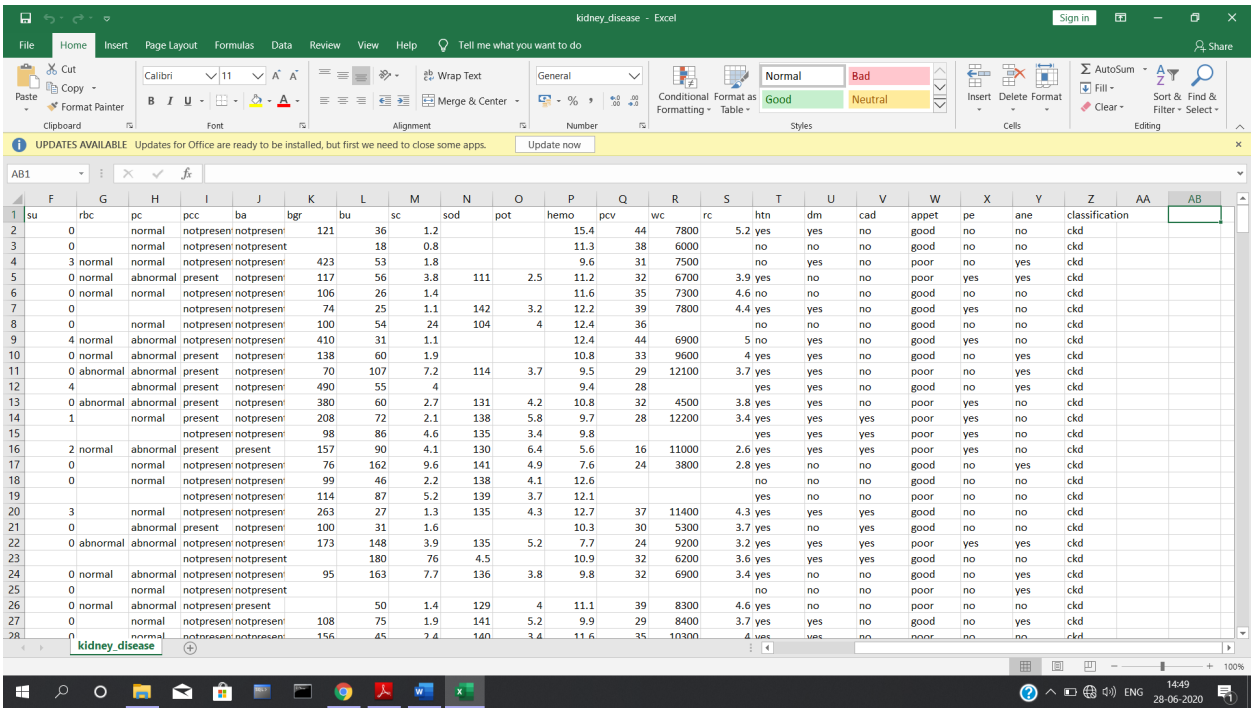
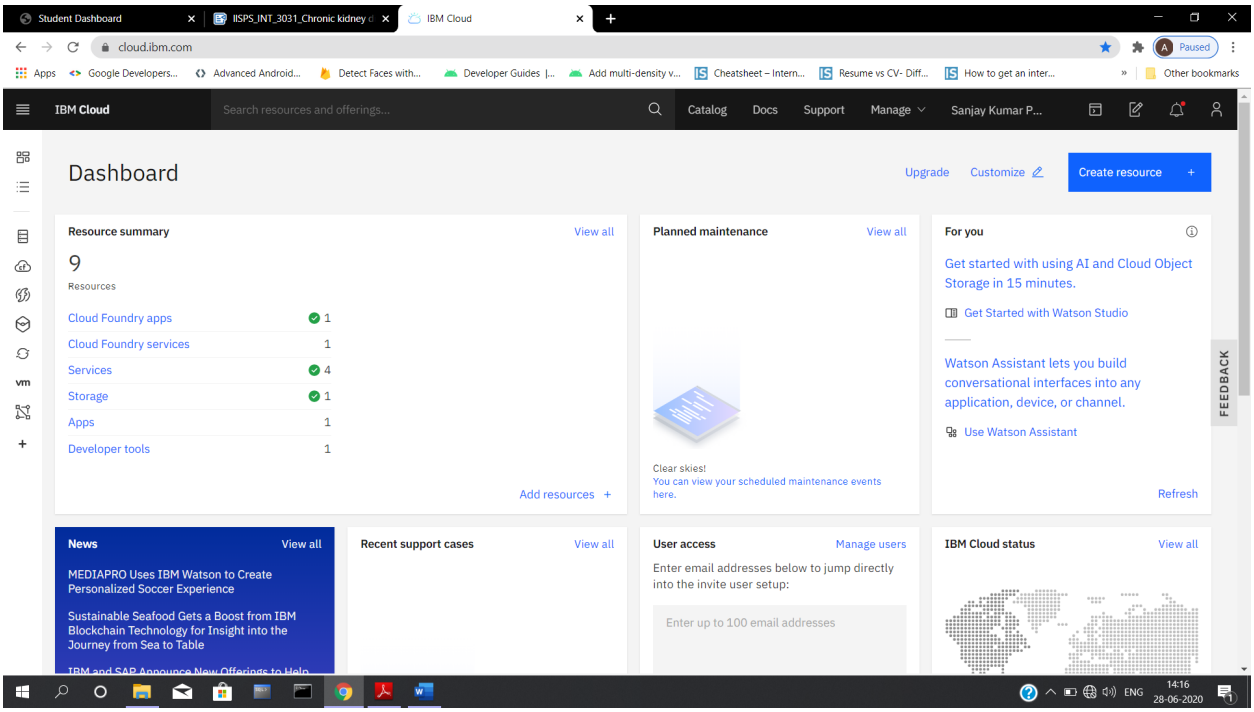
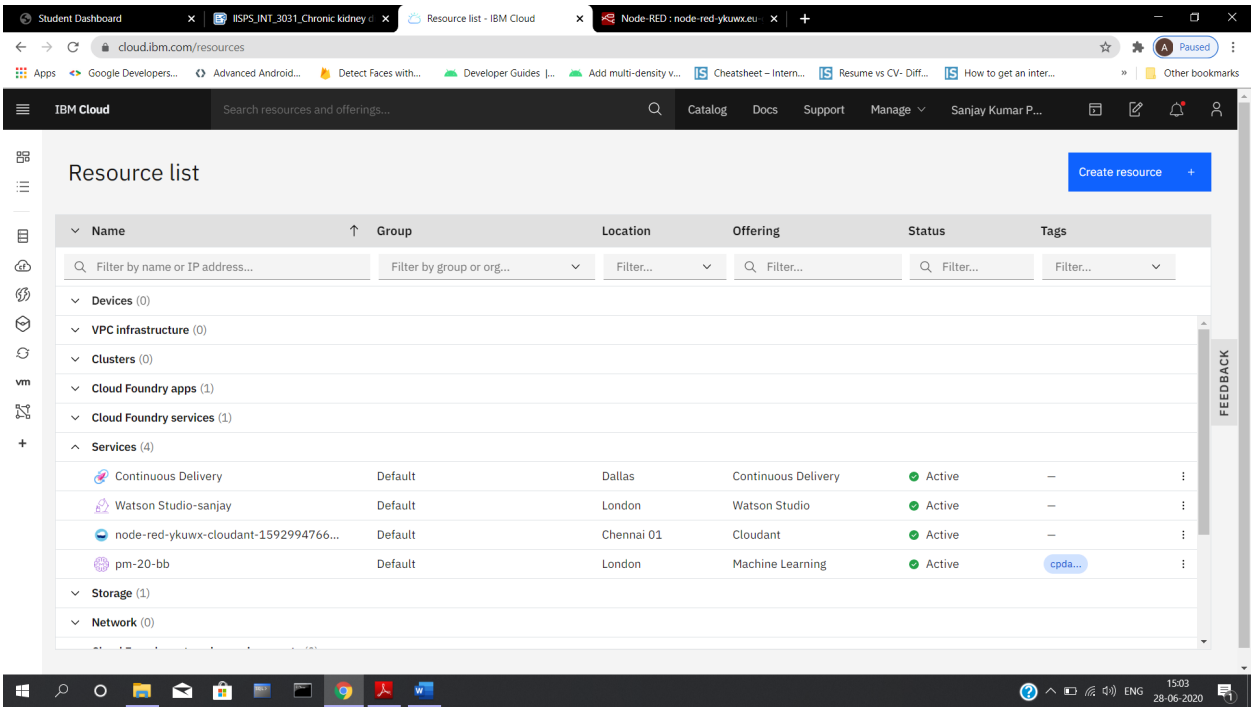


A3 IBM Cloud Service and Model Building Screenshot

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Node-RED : node-red-ykuwx.eu
cloud.ibm.com/resources
IBM Cloud
Search resources and offerings...
Catalog
Docs
Support
Manage
Sanjay Kumar P...
Resource list
Create resource
Name
Group
Location
Offering
Status
Tags
Filter by name or IP address...
Filter by group or org...
Devices (0)
VPC infrastructure (0)
Clusters (0)
Cloud Foundry apps (1)
Cloud Foundry services (1)
Services (4)
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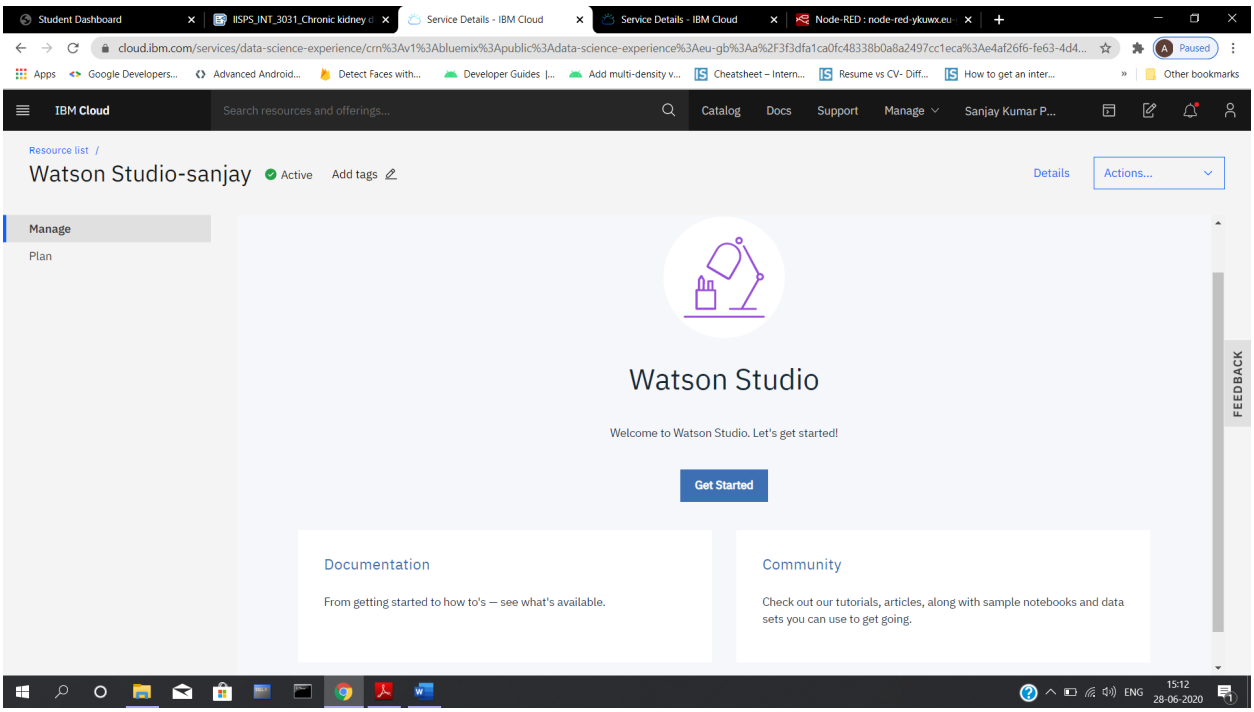
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IBM Cloud
Search resources and offerings...
Catalog
Docs
Support
Manage
Sanjay Kumar P...
Resource list /
Watson Studio-sanjay
Active
Add tags
Details
Actions...
Manage
Plan
Watson Studio
Welcome to Watson Studio. Let's get started!
Get Started
Documentation
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.
FEEDBACK
ENG
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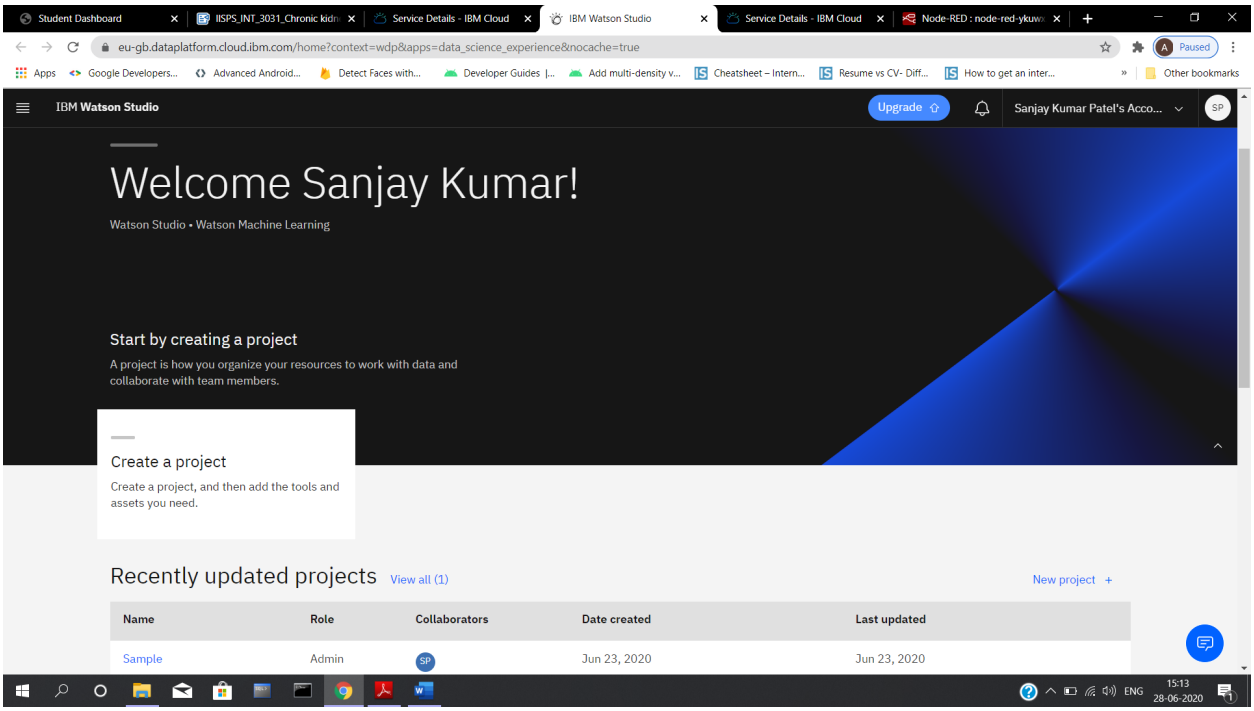
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Advanced Android...
Detect Faces with...
Developer Guides |...
Add multi-density v...
Cheatsheet – Intern...
Resume vs CV- Diff...
How to get an inter...
Other bookmarks
IBM Watson Studio
Upgrade
Sanjay Kumar Patel's Acco...
SP
Welcome Sanjay Kumar!
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
Sample
Admin
SP
Jun 23, 2020
Jun 23, 2020
ENG
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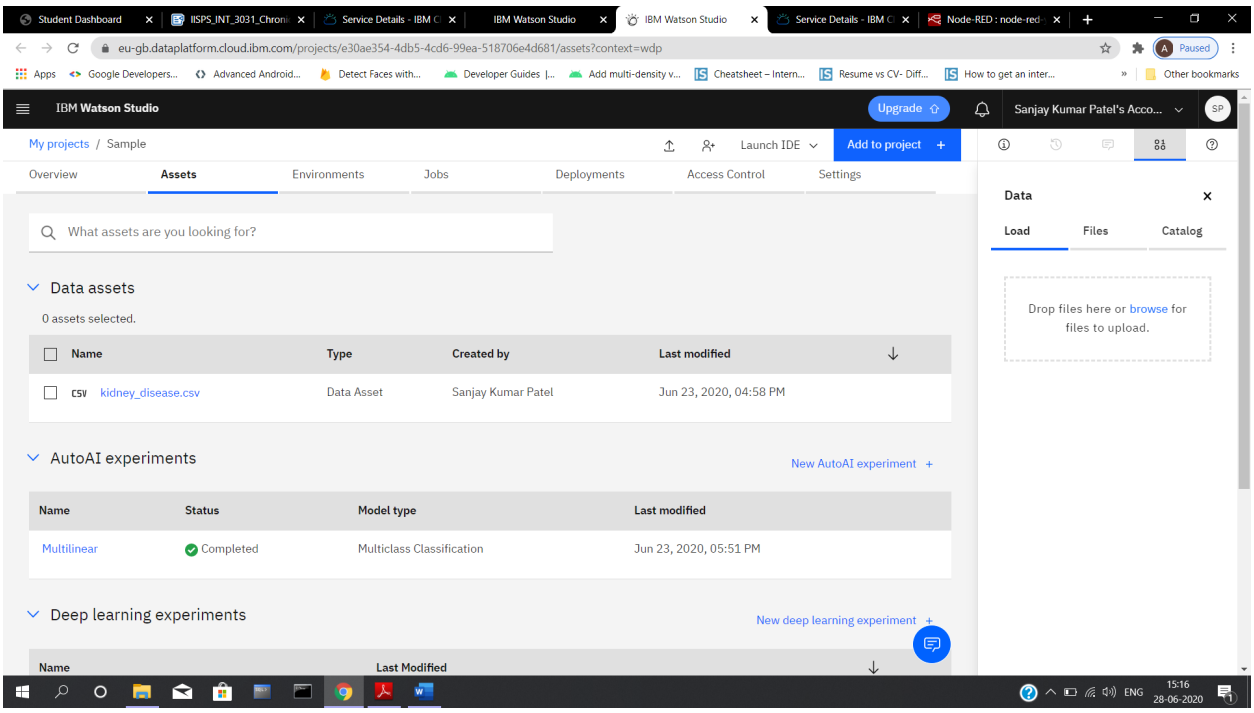
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Service Details - IBM C
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Developer Guides |...
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Resume vs CV- Diff...
How to get an inter...
Other bookmarks
IBM Watson Studio
Upgrade
Sanjay Kumar Patel's Acco...
SP
My projects / Sample
Launch IDE
Add to project +
Overview
Assets
Environments
Jobs
Deployments
Access Control
Settings
What assets are you looking for?
Data assets
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Name
Type
Created by
Last modified
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kidney_disease.csv
Data Asset
Sanjay Kumar Patel
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Status
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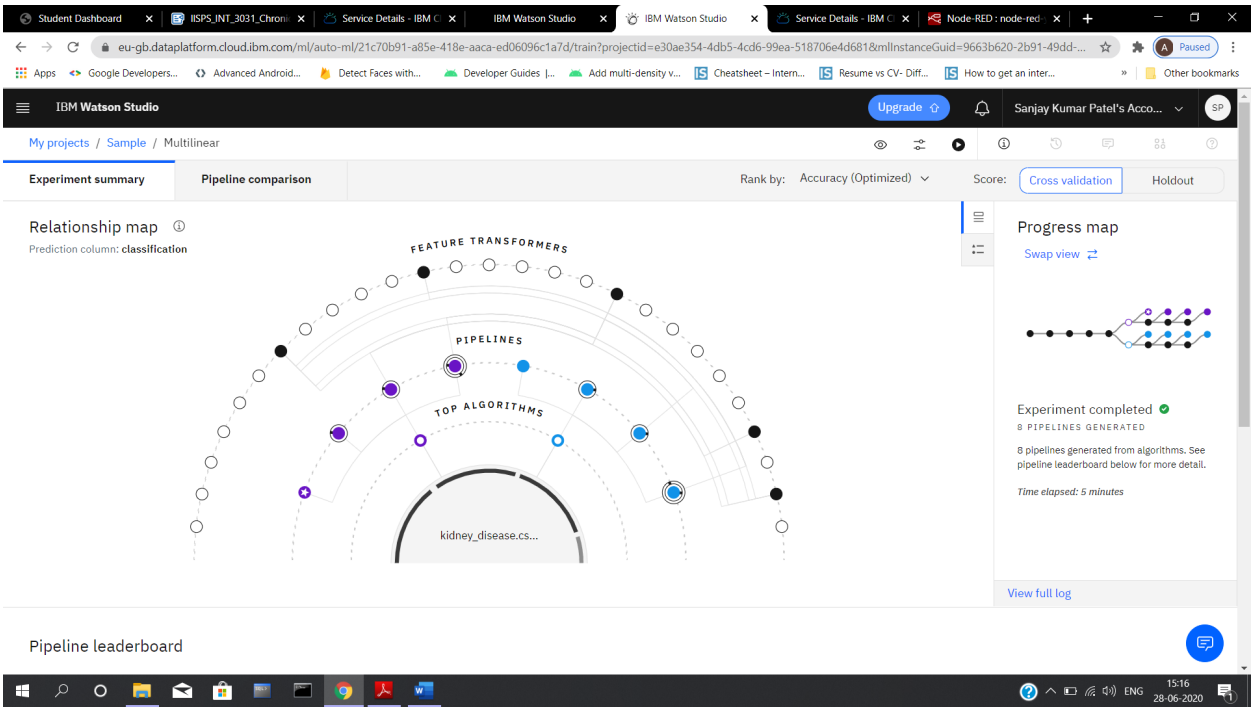
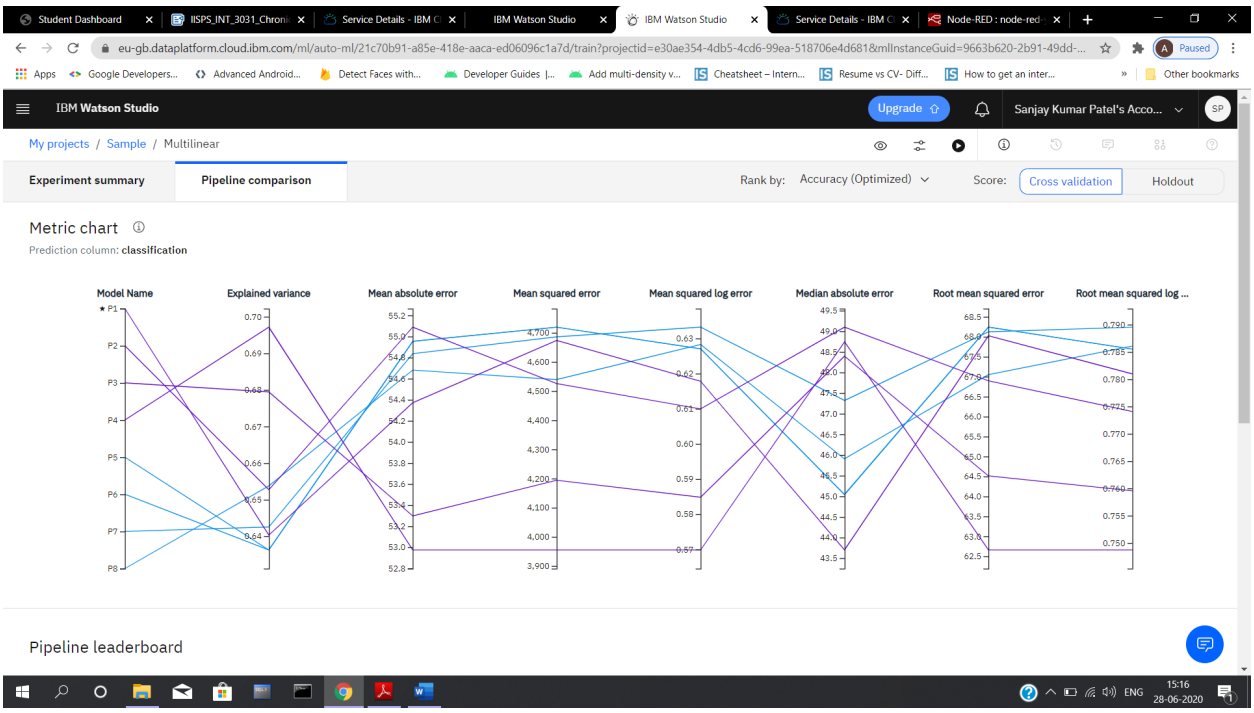
28-06-2020


IBM Watson Studio
Upgrade
Sanjay Kumar Patel's Acco...
My projects / Sample / Multilinear
Experiment summary
Pipeline comparison
Rank by: Accuracy (Optimized)
Score: Cross validation Holdout
Relationship map
Prediction column: classification
FEATURE TRANSFORMERS
PIPELINES
TOP ALGORITHMS
kidney_disease.cs...
Progress map
Swap view
Experiment completed
8 PIPELINES GENERATED
8 pipelines generated from algorithms. See pipeline leaderboard below for more detail.
Time elapsed: 5 minutes
View full log
Pipeline leaderboard


IBM Watson Studio
Upgrade
Sanjay Kumar Patel's Acco...
My projects / Sample / Multilinear
Experiment summary
Pipeline comparison
Rank by: Accuracy (Optimized)
Score: Cross validation Holdout
Metric chart
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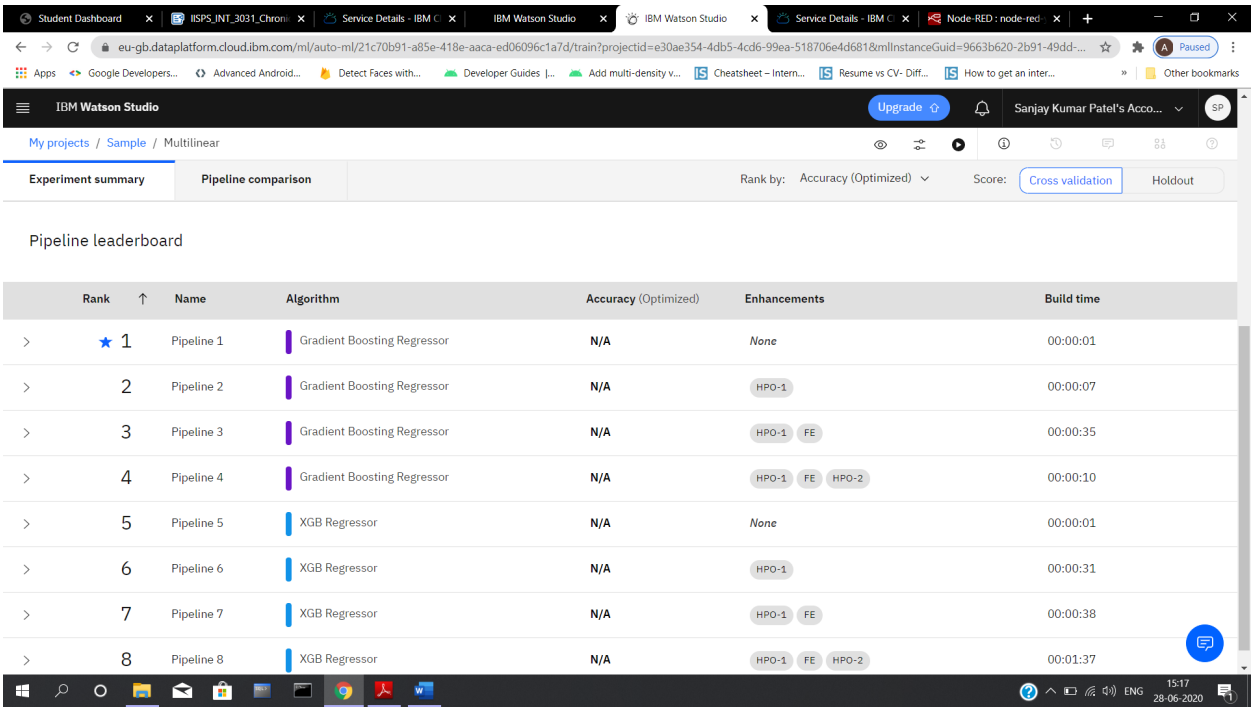
Model Name
Explained variance
Mean absolute error
Mean squared error
Mean squared log error
Median absolute error
Root mean squared error
Root mean squared log ...
Pipeline leaderboard


IBM Watson Studio
Upgrade
Sanjay Kumar Patel's Acco...
My projects / Sample / Multilinear
Experiment summary
Pipeline comparison
Rank by: Accuracy (Optimized)
Score: Cross validation Holdout
Pipeline leaderboard
Rank Name Algorithm Accuracy (Optimized) Enhancements Build time
1 Pipeline 1 Gradient Boosting Regressor N/A None 00:00:01
2 Pipeline 2 Gradient Boosting Regressor N/A HPO-1 00:00:07
3 Pipeline 3 Gradient Boosting Regressor N/A HPO-1 FE 00:00:35
4 Pipeline 4 Gradient Boosting Regressor N/A HPO-1 FE HPO-2 00:00:10
5 Pipeline 5 XGB Regressor N/A None 00:00:01
6 Pipeline 6 XGB Regressor N/A HPO-1 00:00:31
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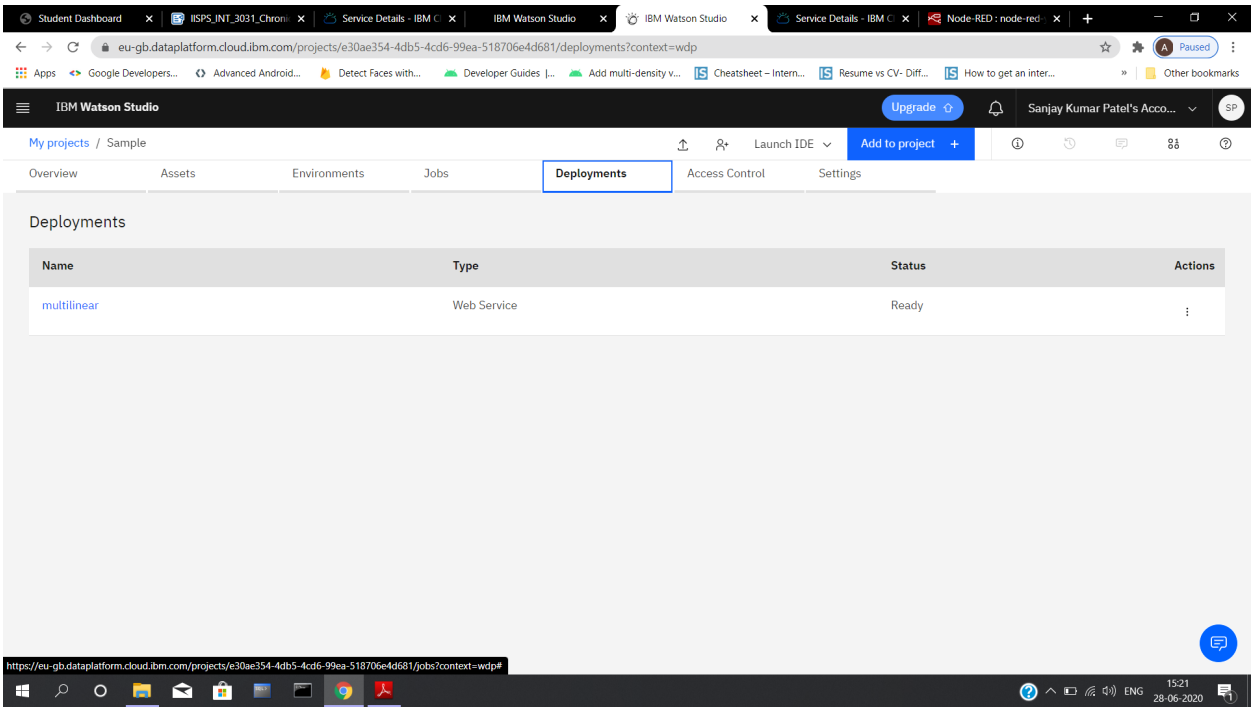
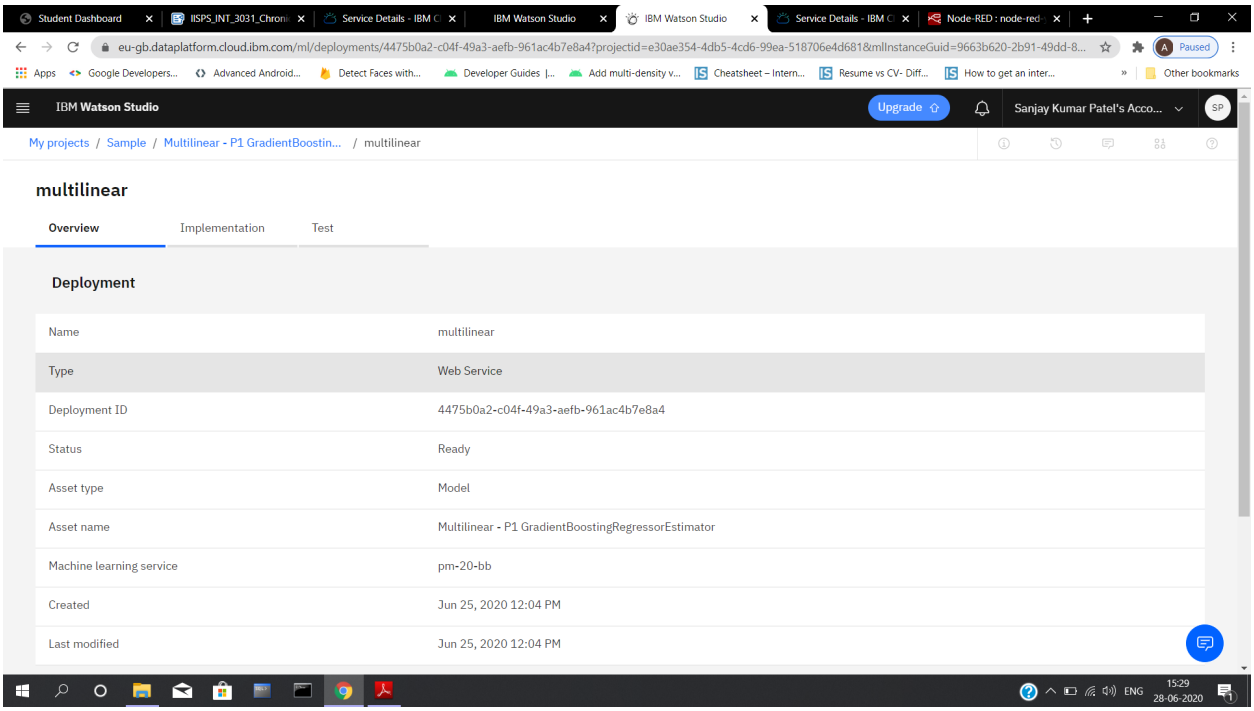
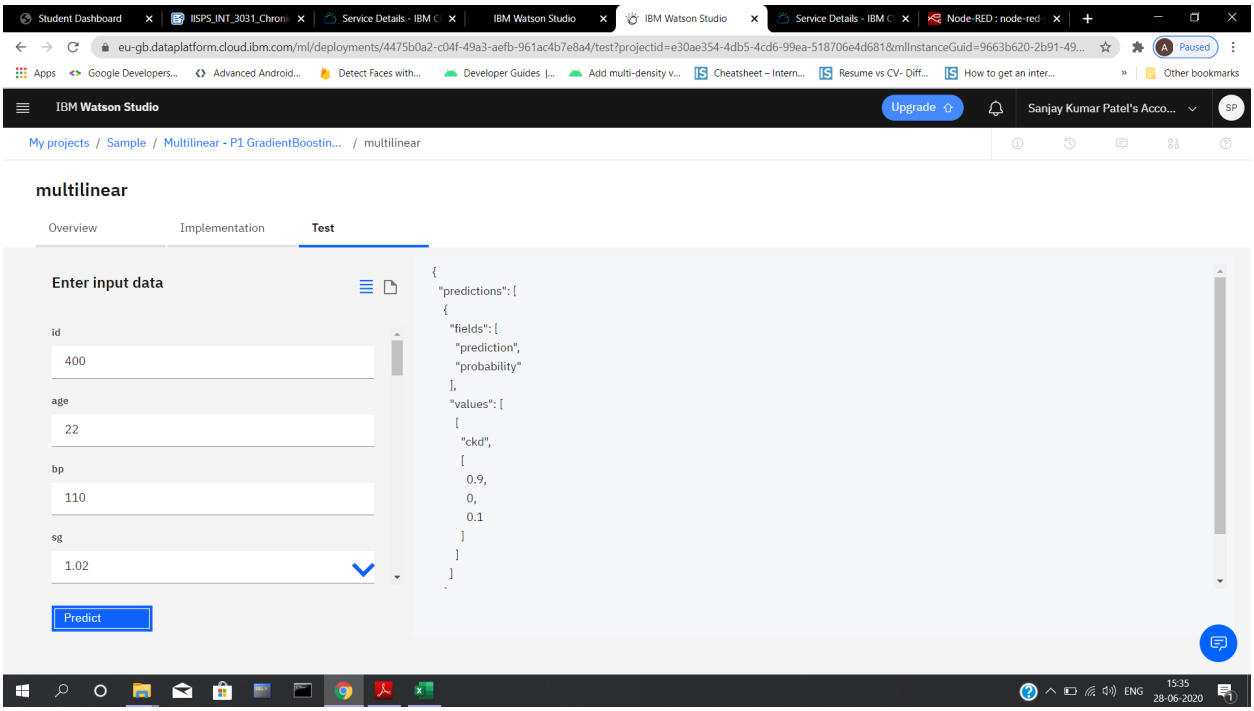
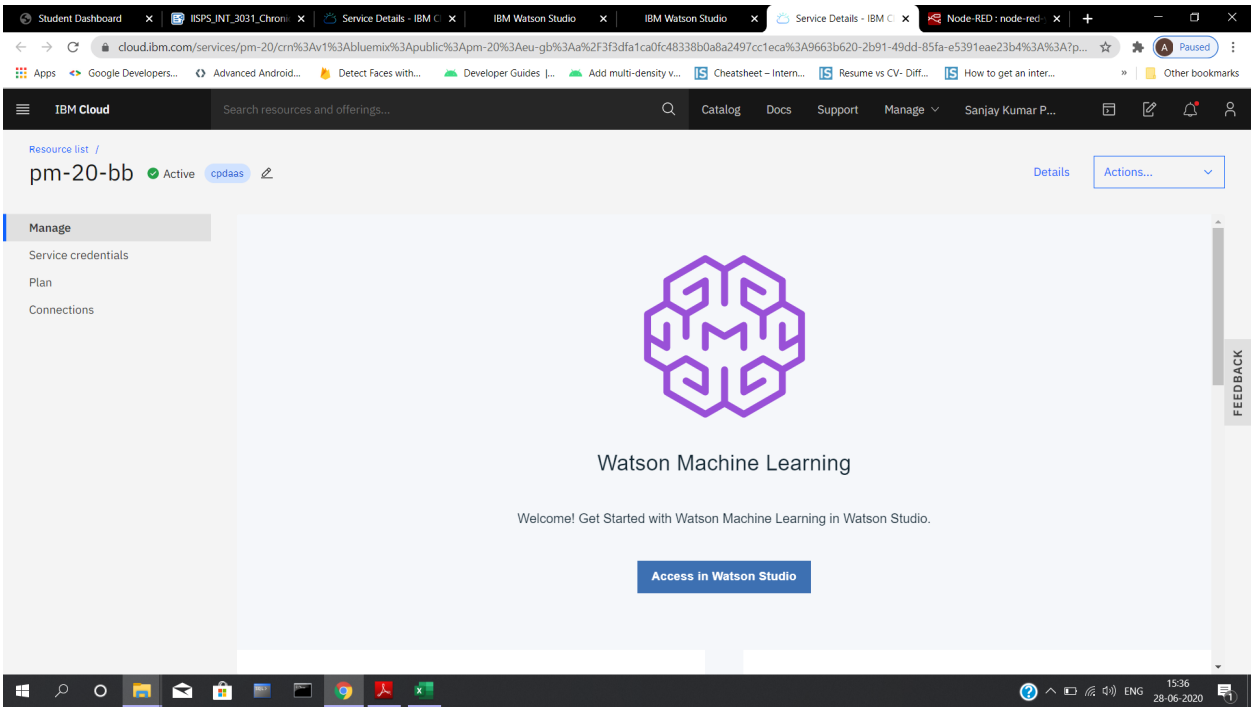
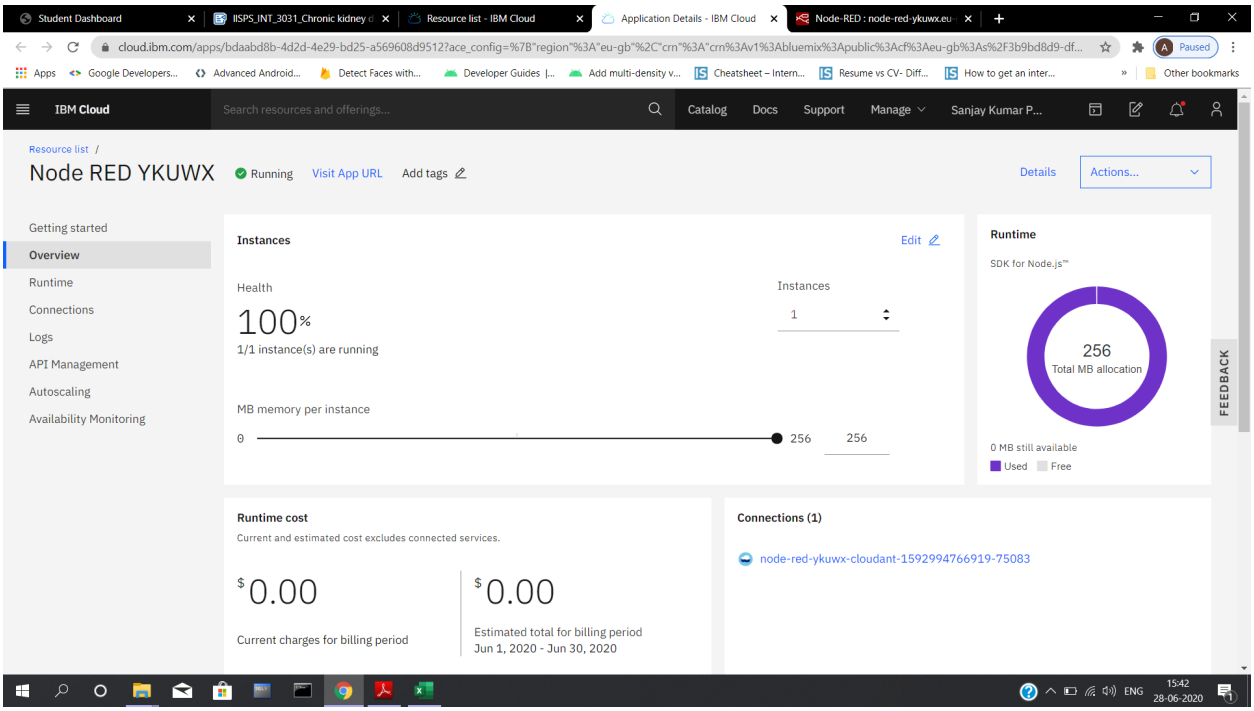
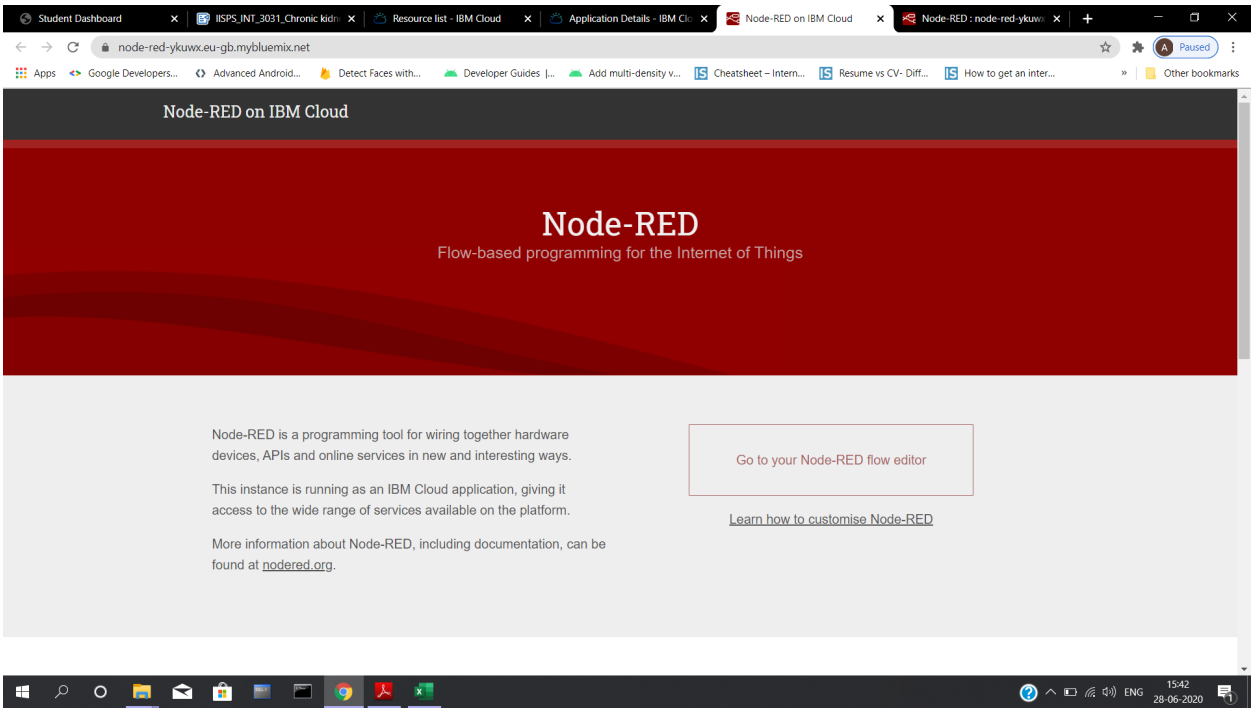

IBM Watson Studio
Upgrade
Sanjay Kumar Patel's Acco...
My projects / Sample
Launch IDE
Add to project
Overview Assets Environments Jobs Deployments Access Control Settings
Deployments
Name Type Status Actions
multilinear Web Service Ready

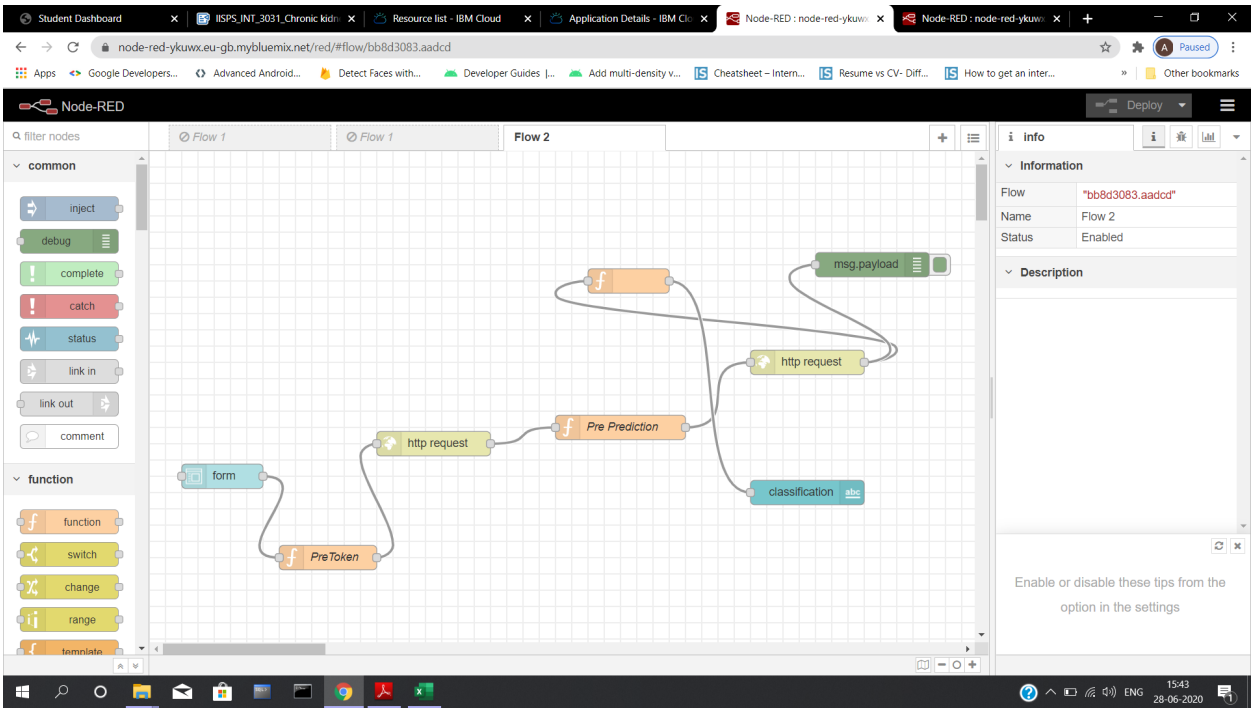

IBM Watson Studio
Upgrade
Sanjay Kumar Patel's Acco...
My projects / Sample / Multilinear - P1 GradientBoostin... / multilinear
multilinear
Overview
Implementation
Test
Deployment
Name multilinear
Type Web Service
Deployment ID 4475b0a2-c04f-49a3-aefb-961ac4b7e8a4
Status Ready
Asset type Model
Asset name Multilinear - P1 GradientBoostingRegressorEstimator
Machine learning service pm-20-bb
Created Jun 25, 2020 12:04 PM
Last modified Jun 25, 2020 12:04 PM


IBM Watson Studio
Upgrade
Sanjay Kumar Patel's Acco...
My projects / Sample / Multilinear - P1 GradientBoostin... / multilinear
multilinear
Overview
Implementation
Test
Enter input data
id
400
age
22
bp
110
sg
1.02
Predict
{
"predictions": [
{
"fields": [
"prediction",
"probability"
],
"values": [
[
"ckd",
[
0.9,
0,
0.1
]
]
]

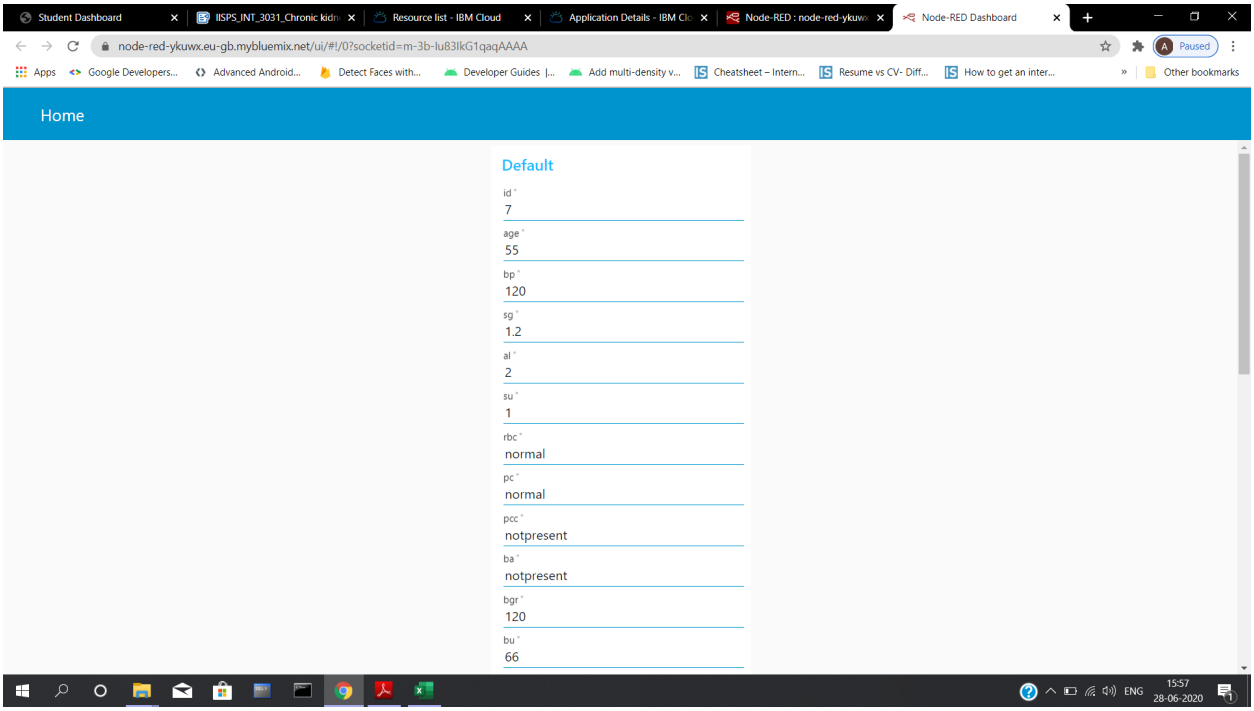

Student Dashboard
IISPS_INT_3031_Chron
Service Details - IBM C
IBM Watson Studio
IBM Watson Studio
Service Details - IBM C
Node-RED : node-red
cloud.ibm.com/services/pm-20/crn%3Av1%3Abluemix%3Apublic%3Apm-20%3Aeu-gb%3Aa%2F3fdfa1ca0fc48338b0a8a2497cc1eca%3A9663b620-2b91-49dd-85fa-e5391eae23b4%3A%3A?p...
Paused
Apps
Google Developers...
Advanced Android...
Detect Faces with...
Developer Guides |...
Add multi-density v...
Cheatsheet – Intern...
Resume vs CV- Diff...
How to get an inter...
Other bookmarks
IBM Cloud
Search resources and offerings...
Catalog
Docs
Support
Manage
Sanjay Kumar P...
Resource list /
pm-20-bb
Active
cpdaas
Details
Actions...
Manage
Service credentials
Plan
Connections
Watson Machine Learning
Welcome! Get Started with Watson Machine Learning in Watson Studio.
Access in Watson Studio
FEEDBACK
ENG
15:36
28-06-2020

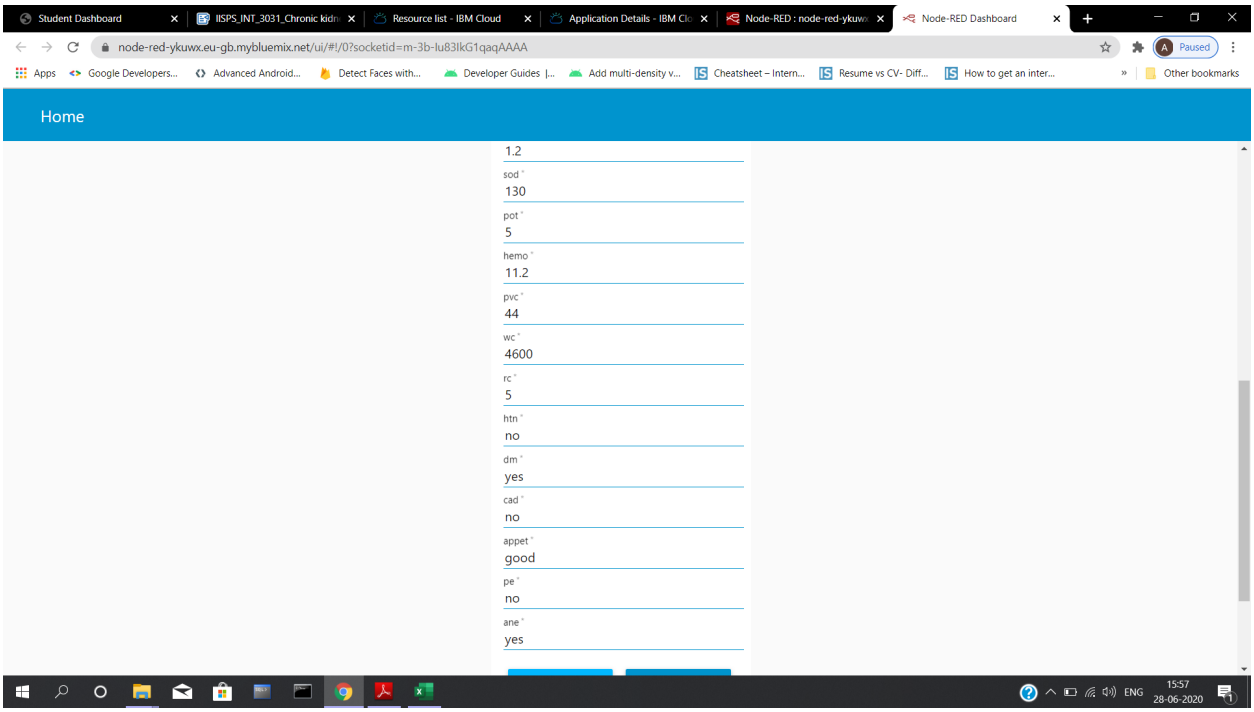

Student Dashboard
IISPS_INT_3031_Chronic kidney
Resource list - IBM Cloud
Application Details - IBM Cloud
Node-RED : node-red-ykuwx.eu
cloud.ibm.com/apps/bdaabd8b-4d2d-4e29-bd25-a569608d9512?ace_config=%7B"region"%3A"eu-gb"%2C"crn"%3A"crn%3Av1%3Abluemix%3Apublic%3Acf%3Aeu-gb%3As%2F3b9bd8d9-df...
Paused
Apps
Google Developers...
Advanced Android...
Detect Faces with...
Developer Guides |...
Add multi-density v...
Cheatsheet – Intern...
Resume vs CV- Diff...
How to get an inter...
Other bookmarks
IBM Cloud
Search resources and offerings...
Catalog
Docs
Support
Manage
Sanjay Kumar P...
Resource list /
Node RED YKUWX
Running
Visit App URL
Add tags
Details
Actions...
Getting started
Overview
Runtime
Connections
Logs
API Management
Autoscaling
Availability Monitoring
Instances
Edit
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
Jun 1, 2020 - Jun 30, 2020
Connections (1)
node-red-ykuwx-cloudant-1592994766919-75083
FEEDBACK
ENG
15:42
28-06-2020

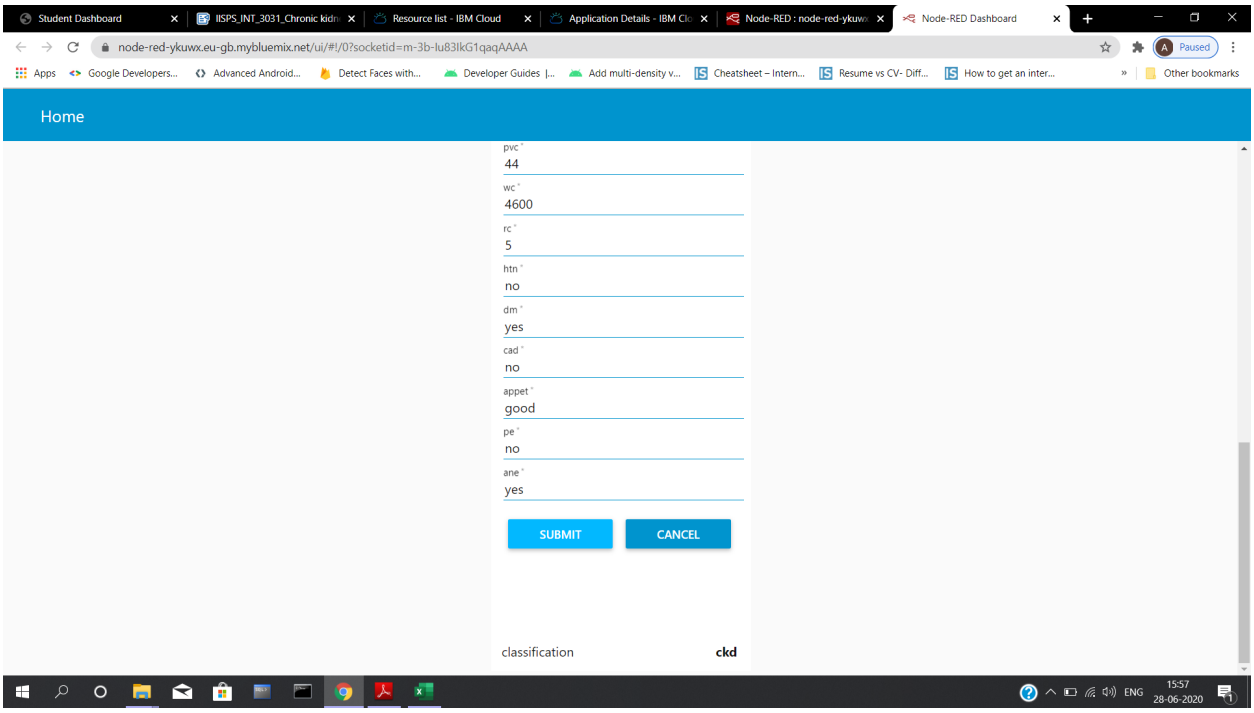

Student Dashboard
Resource list - IBM Cloud
Application Details - IBM Cl
Node-RED on IBM Cloud
node-red-ykuwx.eu-gb.mybluemix.net
Paused
Node-RED on IBM Cloud
Node-RED
Flow-based programming for the Internet of Things
Node-RED is a programming tool for wiring together hardware devices, APIs and online services in new and interesting ways.
This instance is running as an IBM Cloud application, giving it access to the wide range of services available on the platform.
More information about Node-RED, including documentation, can be found at nodered.org.
Go to your Node-RED flow editor
Learn how to customise Node-RED
ENG
15:42
28-06-2020


Student Dashboard
Resource list - IBM Cloud
Application Details - IBM Cl
Node-RED : node-red-ykuw
node-red-ykuwx.eu-gb.mybluemix.net/red/#flow/bb8d3083.aadcd
Paused
Node-RED
Deploy
filter nodes
Flow 1
Flow 1
Flow 2
common
inject
debug
complete
catch
status
link in
link out
comment
function
function
switch
change
range
template
msg.payload
http request
Pre Prediction
http request
form
classification
PreToken
info
Information
Flow
"bb8d3083.aadcd"
Name
Flow 2
Status
Enabled
Description
Enable or disable these tips from the option in the settings
ENG
15:43
28-06-2020

UI page


Student Dashboard
Resource list - IBM Cloud
Application Details - IBM Cl
Node-RED : node-red-ykuw
Node-RED Dashboard
node-red-ykuwx.eu-gb.mybluemix.net/ui/#!/0?socketid=m-3b-lu83lkG1qaqAAAA
Paused
Apps
Google Developers...
Advanced Android...
Detect Faces with...
Developer Guides |...
Add multi-density v...
Cheatsheet – Intern...
Resume vs CV- Diff...
How to get an inter...
Other bookmarks
Home
Default
id 7
age 55
bp 120
sg 1.2
al 2
su 1
rbc normal
pc normal
pcc notpresent
ba notpresent
bgr 120
bu 66
ENG
15:57
28-06-2020


Student Dashboard
Resource list - IBM Cloud
Application Details - IBM Cl
Node-RED : node-red-ykuw
Node-RED Dashboard
node-red-ykuwx.eu-gb.mybluemix.net/ui/#!/0?socketid=m-3b-lu83lkG1qaqAAAA
Paused
Apps
Google Developers...
Advanced Android...
Detect Faces with...
Developer Guides |...
Add multi-density v...
Cheatsheet – Intern...
Resume vs CV- Diff...
How to get an inter...
Other bookmarks
Home
1.2
sod 130
pot 5
hemo 11.2
pvc 44
wc 4600
rc 5
htn no
dm yes
cad no
appet good
pe no
ane yes
ENG
15:57
28-06-2020



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\nglobal.set(\"al\",msg.payload.al)\nglobal.set(\"su\",msg.payload.su)\nglobal.set(\"rbc
\",msg.payload.rbc)\nglobal.set(\"pc\",msg.payload.pc)\nglobal.set(\"pcc\",msg.payloa
d.pcc)\nglobal.set(\"ba\",msg.payload.ba)\nglobal.set(\"bgr\",msg.payload.bgr)\nglobal
.set(\"bu\",msg.payload.bu)\nglobal.set(\"sc\",msg.payload.sc)\nglobal.set(\"sod\",msg.
payload.sod)\nglobal.set(\"pot\",msg.payload.pot)\nglobal.set(\"hemo\",msg.payload.h
emo)\nglobal.set(\"pvc\",msg.payload.pvc)\nglobal.set(\"wc\",msg.payload.wc)\nglobal
.set(\"rc\",msg.payload.rc)\nglobal.set(\"htn\",msg.payload.htn)\nglobal.set(\"dm\",msg
.payload.dm)\nglobal.set(\"cad\",msg.payload.cad)\nglobal.set(\"appet\",msg.payload.
appet)\nglobal.set(\"pe\",msg.payload.pe)\nglobal.set(\"ane\",msg.payload.ane)\nvar
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global.get('rbc')\nvar pc = global.get('pc')\nvar pcc= global.get('pcc')\nvar ba =
global.get('ba')\nvar bgr = global.get('bgr')\nvar bu = global.get('bu')\nvar sc =
global.get('sc')\nvar sod = global.get('sod')\nvar pot = global.get('pot')\nvar hemo =
global.get('hemo')\nvar pvc = global.get('pvc')\nvar wc = global.get('wc')\nvar rc =
global.get('rc')\nvar htn = global.get('htn')\nvar dm = global.get('dm')\nvar cad =
global.get('cad')\nvar appet = global.get('appet')\nvar pe = global.get('pe')\nvar ane =

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