

Train Model on IBM

Date	14 - November - 2022
Team ID	PNT2022TMID02356
Project Name	Car Resale value Prediction

1. Training the ML Model in IBM Watson Studio:

The screenshot displays the IBM Watson Studio interface. At the top, a navigation bar includes the IBM Watson Studio logo, a search bar, and user account information for Karthikeyan H. The main dashboard area features a welcome message and three primary action cards: 'Take a tutorial', 'Work with data', and 'Learn what's new'. Below these, a 'Quick start' section lists several guided workflows. The central 'Projects' panel highlights the 'car resale value prediction-Deployment' project, which was last updated on November 14, 2022. To the right, the 'Notifications' panel shows two 'Online deployment ready' alerts for the 'models' deployment. The 'Deployments' panel on the far right lists the 'models' deployment, also dated November 14, 2022. A 'New in gallery' section at the bottom left promotes 'AI governance' tutorials. The bottom of the dashboard features a 'What's new' section with updates on the Python 3.10 runtime.

IBM Watson Studio

Welcome, Karthikeyan!

Take a tutorial
Step through implementing a Data fabric use case in a sample project.

Work with data
Create a project for your team to prepare data, find insights, or build models.

Learn what's new
Stay current with new features, enhancements, and other changes.

Quick start

- Create data pipelines with DataStage
- Build customer profiles with IBM Match 360 with Watson
- Catalog and govern data with Watson Knowledge Catalog
- Build and manage ML models with Watson Studio
- Query data anywhere with Watson Query

What's new
New Runtime 2022 release for Python 3.10

Projects

- car resale value prediction-Deployment (Nov 14, 2022 12:18 PM)

New in gallery

- SAMPLE PROJECT**
- AI governance**
Tutorials in this project: Build and deploy a machine learning model to predict which applicants qualify for mortgages; Test and validate the model for fairness, accuracy, trustworthiness, and readiness for production.

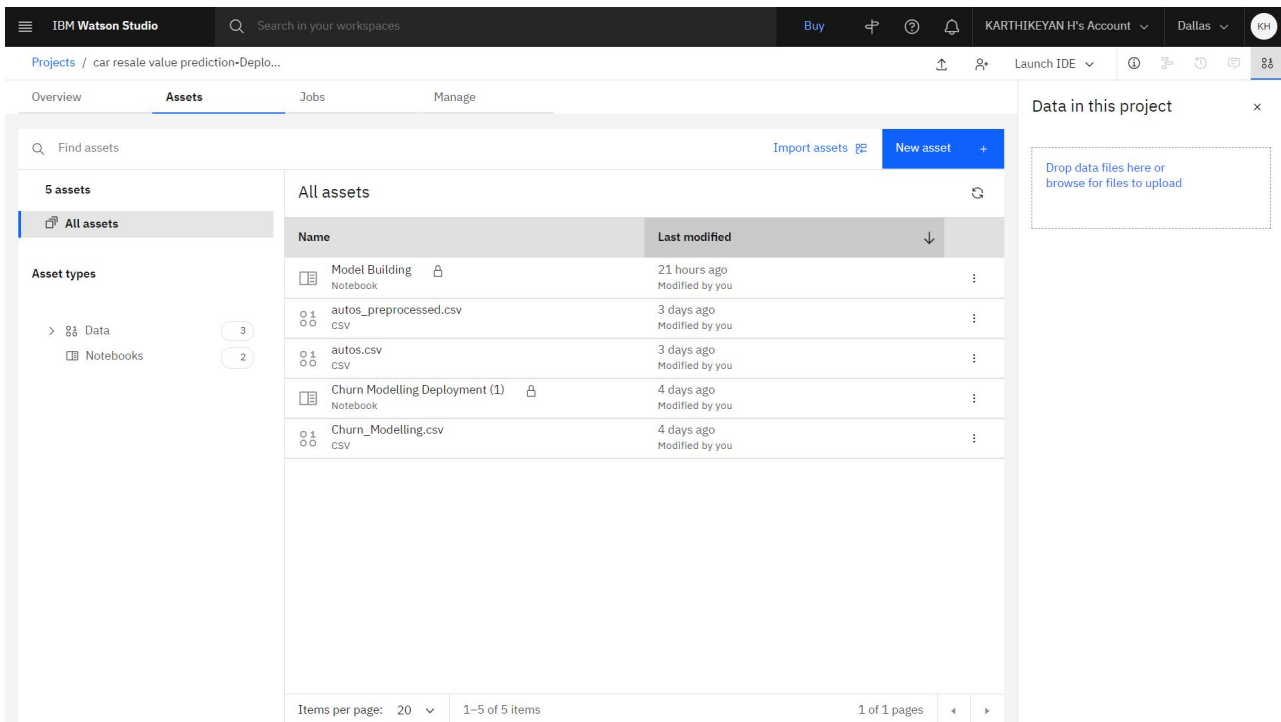
Notifications

- Online deployment ready**
The online deployment **Model Building in space models** is ready to accept requests. Yesterday at 10:26 PM
- Online deployment ready**
The online deployment **newdeployment in space models** is ready to accept requests. Nov 14, 2022 12:50 PM

Deployments

- models** (Nov 14, 2022 12:48 PM)

2. Model for Vehicle performance has been created using Jupyter Notebook.



The screenshot shows the IBM Watson Studio interface. The top navigation bar includes the IBM logo, a search bar, and user account information. The main area is divided into tabs: Overview, Assets (selected), Jobs, and Manage. On the left, there's a sidebar with 'Find assets' and a list of asset types: Data (3 items) and Notebooks (2 items). The central pane displays a table of assets:

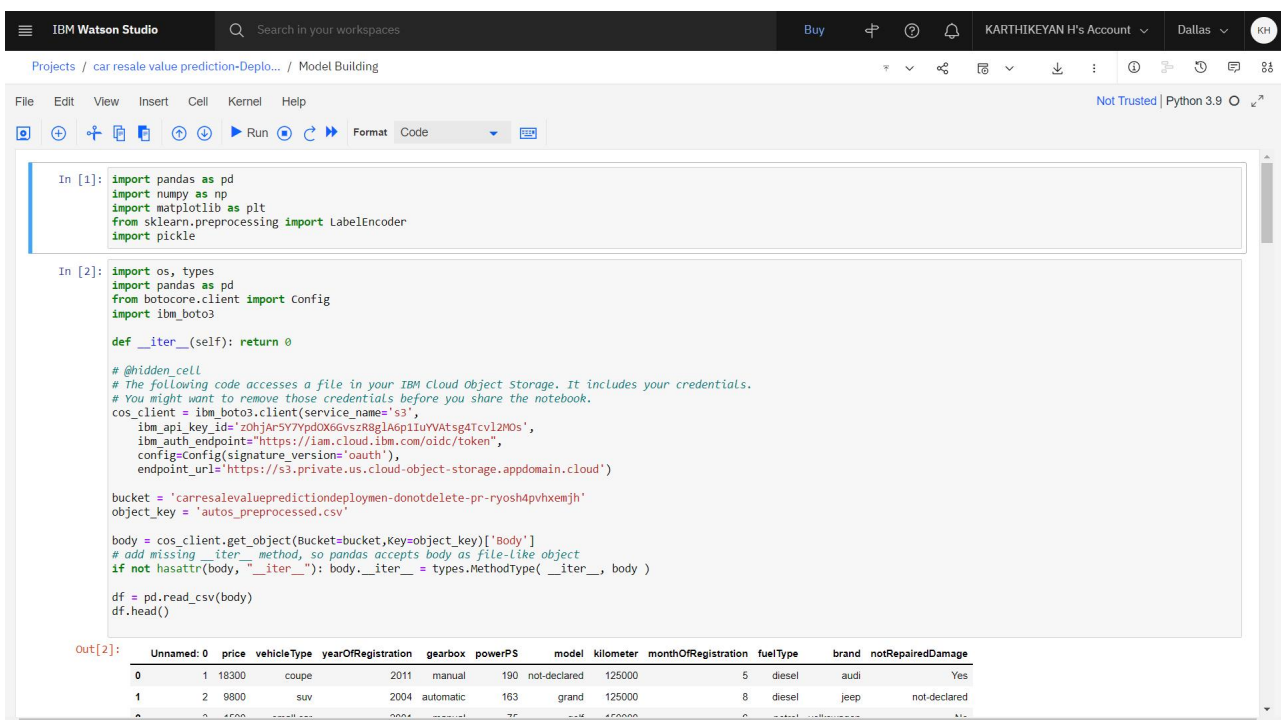
Name	Last modified
Model Building Notebook	21 hours ago Modified by you
autos_preprocessed.csv	3 days ago Modified by you
autos.csv	3 days ago Modified by you
Churn Modelling Deployment (1) Notebook	4 days ago Modified by you
Churn_Modelling.csv	4 days ago Modified by you

On the right, there's a 'Data in this project' section with a drop zone for uploading files.

Dataset: Autos.csv

Autos_Preprocessed.csv

Churn_Modeling.csn



The screenshot shows a Jupyter Notebook in IBM Watson Studio. The top navigation bar is the same as the previous image. The notebook interface includes a menu bar (File, Edit, View, Insert, Cell, Kernel, Help) and a toolbar with icons for file operations, running, and formatting. The code area contains two input cells:

```
In [1]: import pandas as pd
import numpy as np
import matplotlib as plt
from sklearn.preprocessing import LabelEncoder
import pickle

In [2]: import os, types
import pandas as pd
from boto3.client import Config
import boto3

def __iter__(self): return 0

# @hidden_cell
# The following code accesses a file in your IBM Cloud Object Storage. It includes your credentials.
# You might want to remove those credentials before you share the notebook.
cos_client = boto3.client(service_name='s3',
    ibm_api_key_id='z0hJArsY7Ypd0X6GvsZ8g1A6p1IuvVAtsg4Tcvl2M0s',
    ibm_auth_endpoint='https://iam.cloud.ibm.com/oidc/token',
    config=Config(signature_version='oauth'),
    endpoint_url='https://s3.private.us.cloud-object-storage.appdomain.cloud')

bucket = 'carresalevaluepredictiondeployment-donotdelete-pr-ryosh4pvxemjh'
object_key = 'autos_preprocessed.csv'

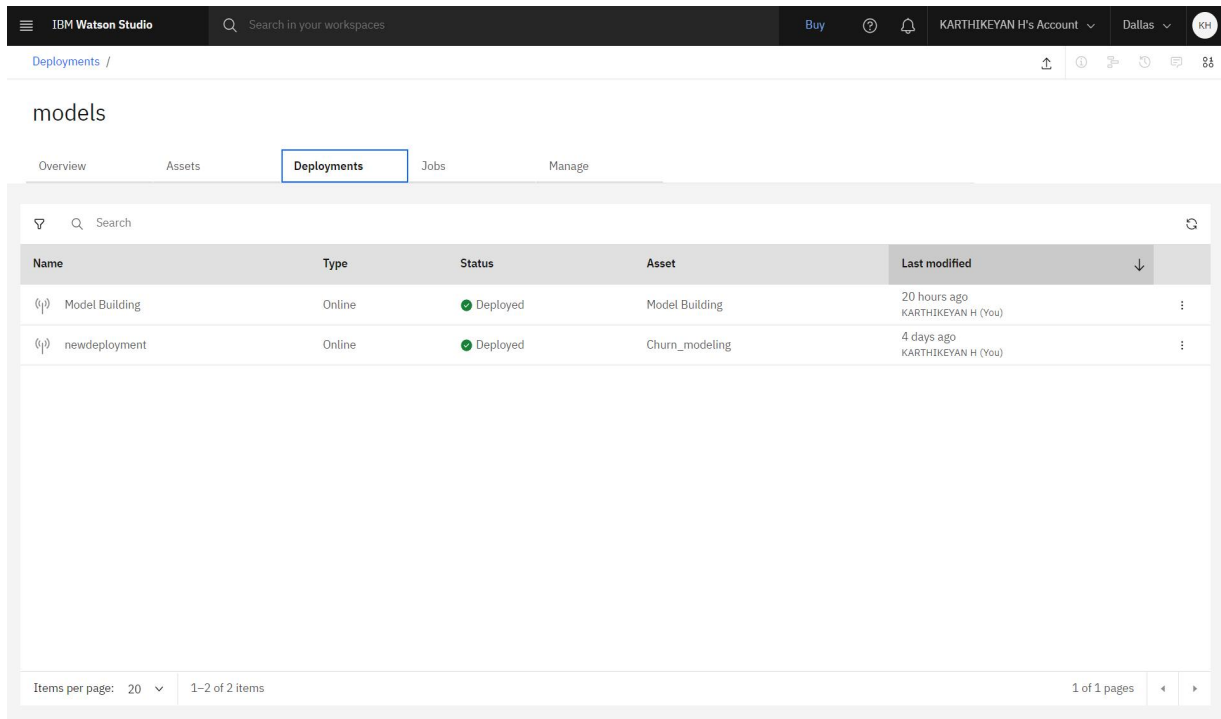
body = cos_client.get_object(Bucket=bucket,Key=object_key)['Body']
# add missing __iter__ method, so pandas accepts body as file-like object
if not hasattr(body, "__iter__"): body.__iter__ = types.MethodType(__iter__, body)

df = pd.read_csv(body)
df.head()
```

The output of the second cell shows the first few rows of the 'autos_preprocessed.csv' dataset:

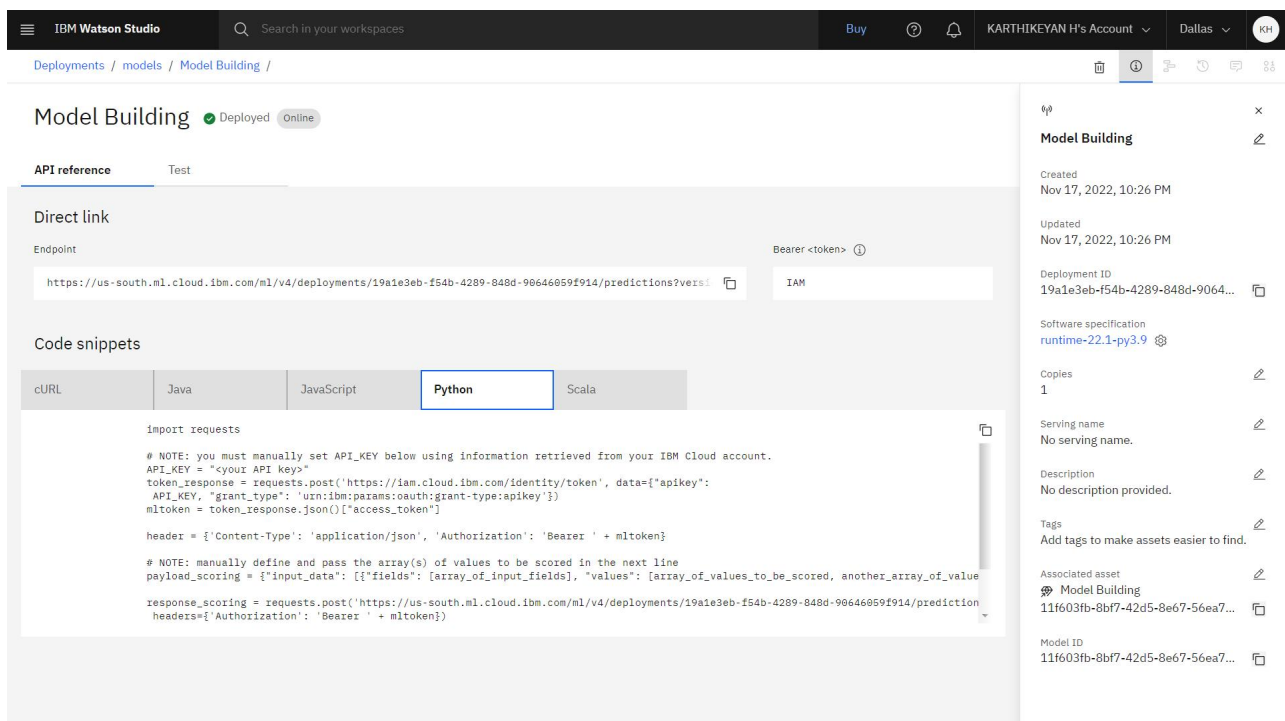
Unnamed: 0	price	vehicleType	yearOfRegistration	gearbox	powerPS	model	kilometer	monthOfRegistration	fuelType	brand	notRepairedDamage
0	18300	coupe	2011	manual	190	not-declared	125000	5	diesel	audi	Yes
1	9800	suv	2004	automatic	163	grand	125000	8	diesel	jeep	not-declared

3. Model for Car Resale Model has been created using Jupyter Notebook and Deployed under “models” space.



The screenshot shows the IBM Watson Studio interface. At the top, there's a navigation bar with 'IBM Watson Studio', a search bar, and user account information. Below the navigation bar, the 'Deployments' tab is selected. The main content area shows a table of deployments under the 'models' space. The table has columns for Name, Type, Status, Asset, and Last modified. Two deployments are listed: 'Model Building' and 'newdeployment', both with a status of 'Deployed'.

Name	Type	Status	Asset	Last modified
Model Building	Online	Deployed	Model Building	20 hours ago KARTHIKEYAN H (You)
newdeployment	Online	Deployed	Churn_modeling	4 days ago KARTHIKEYAN H (You)



The screenshot shows the IBM Watson Studio interface for a specific model deployment. The 'Model Building' tab is selected, and the 'API reference' sub-tab is active. The main content area displays the API endpoint and code snippets for the model. The endpoint is `https://us-south.ml.cloud.ibm.com/ml/v4/deployments/19a1e3eb-f54b-4289-848d-98646059f914/predictions?version=...`. The code snippets are for cURL, Java, JavaScript, Python, and Scala. The Python snippet shows the code for making a prediction request using the requests library.

Model Building Deployed Online

API reference Test

Direct link

Endpoint Bearer <token>

`https://us-south.ml.cloud.ibm.com/ml/v4/deployments/19a1e3eb-f54b-4289-848d-98646059f914/predictions?version=...`

Code snippets

cURL Java JavaScript Python Scala

```
import requests

# NOTE: you must manually set API_KEY below using information retrieved from your IBM Cloud account.
API_KEY = "<your API key>"
token_response = requests.post('https://iam.cloud.ibm.com/identity/token', data={"apikey":
API_KEY, "grant_type": "urn:ibm:params:oauth:grant-type:apikey"})
mltoken = token_response.json()["access_token"]

header = {'Content-Type': 'application/json', 'Authorization': 'Bearer ' + mltoken}

# NOTE: manually define and pass the array(s) of values to be scored in the next line
payload_scoring = {"input_data": [{"fields": [array_of_input_fields], "values": [array_of_values_to_be_scored, another_array_of_value]}]}

response_scoring = requests.post('https://us-south.ml.cloud.ibm.com/ml/v4/deployments/19a1e3eb-f54b-4289-848d-98646059f914/predictions', headers=header, data=payload_scoring)
```