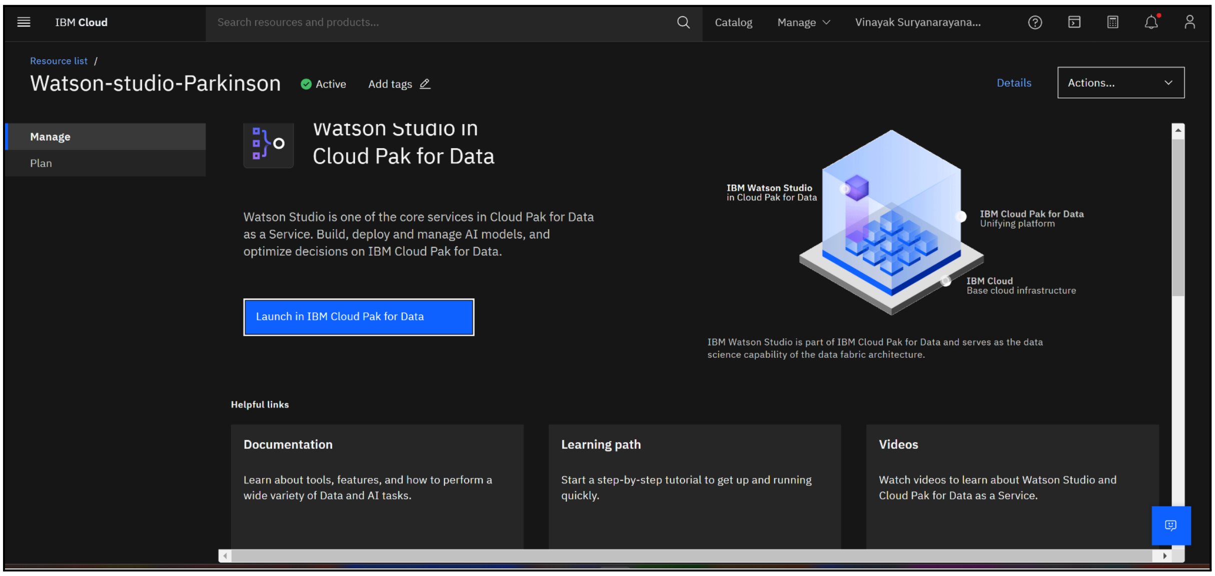
MODEL DEPLOYMENT IN IBM CLOUD

Team ID	PNT2022TMID35637
Project Name	Detecting Parkinsons’ Disease Using Machine Learning

IBM Watson Studio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Resource list /
Watson-studio-Parkinson
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IBM Watson Studio in Cloud Pak for Data
IBM Cloud Pak for Data Unifying platform
IBM Cloud Base cloud infrastructure
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Helpful links

Watson Studio in Cloud Pak for Data

Watson Studio is one of the core services in Cloud Pak for Data as a Service. Build, deploy and manage AI models, and optimize decisions on IBM Cloud Pak for Data.

IBM Watson Studio is part of IBM Cloud Pak for Data and serves as the data science capability of the data fabric architecture.

Documentation

Learn about tools, features, and how to perform a wide variety of Data and AI tasks.

Learning path

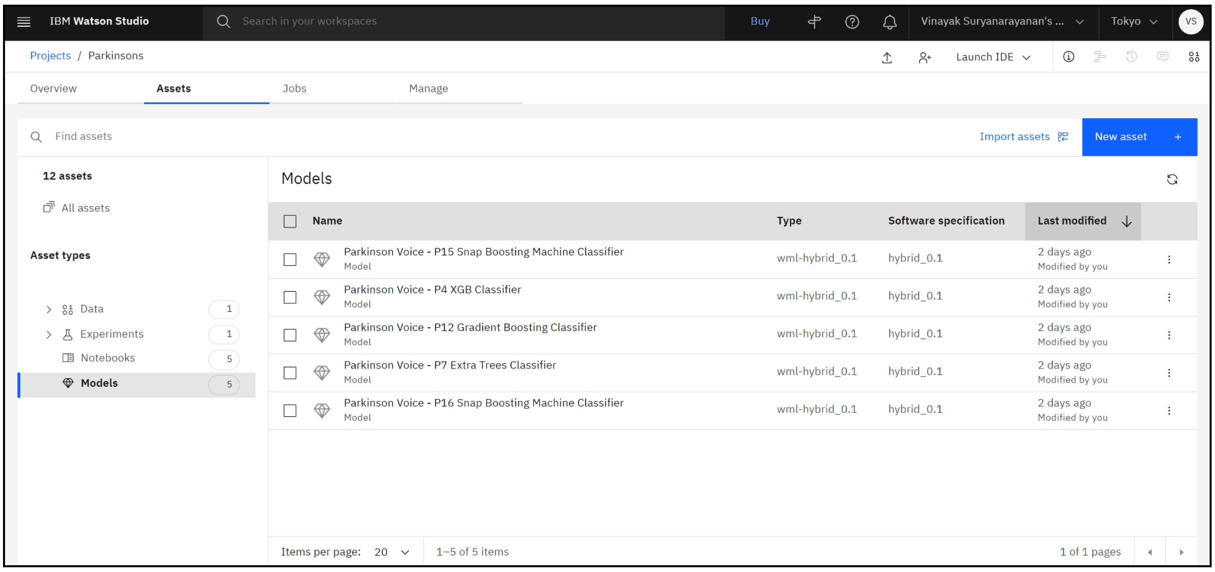
Start a step-by-step tutorial to get up and running quickly.

Videos

Watch videos to learn about Watson Studio and Cloud Pak for Data as a Service.

Parkinson’s Disease Voice Model Trained Using IBM Auto AI

Saved Voice Models

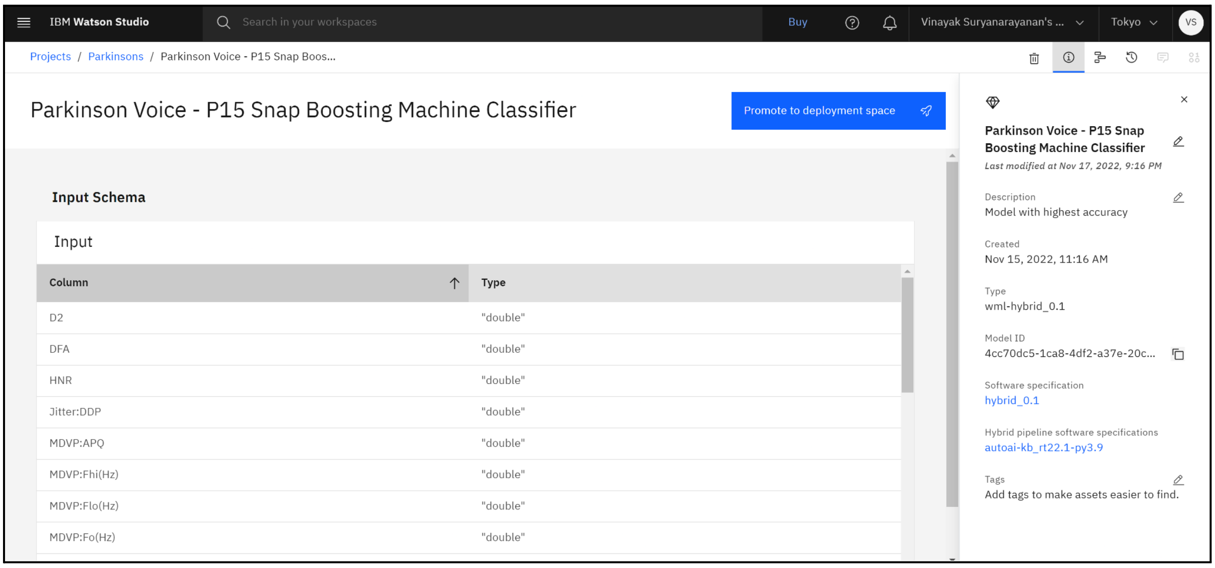


Models

Name	Type	Software specification	Last modified
Parkinson Voice - P15 Snap Boosting Machine Classifier Model	wml-hybrid_0.1	hybrid_0.1	2 days ago Modified by you
Parkinson Voice - P4 XGB Classifier Model	wml-hybrid_0.1	hybrid_0.1	2 days ago Modified by you
Parkinson Voice - P12 Gradient Boosting Classifier Model	wml-hybrid_0.1	hybrid_0.1	2 days ago Modified by you
Parkinson Voice - P7 Extra Trees Classifier Model	wml-hybrid_0.1	hybrid_0.1	2 days ago Modified by you
Parkinson Voice - P16 Snap Boosting Machine Classifier Model	wml-hybrid_0.1	hybrid_0.1	2 days ago Modified by you

Items per page: 20 1–5 of 5 items 1 of 1 pages

Model With Highest Accuracy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VS
Projects / Parkinsons / Parkinson Voice - P15 Snap Boos...
Promote to deployment space

Parkinson Voice - P15 Snap Boosting Machine Classifier

Input Schema

Input

Column	Type
D2	"double"
DFA	"double"
HNR	"double"
Jitter:DDP	"double"
MDVP:APQ	"double"
MDVP:Fhi(Hz)	"double"
MDVP:Flo(Hz)	"double"
MDVP:Fo(Hz)	"double"

Parkinson Voice - P15 Snap Boosting Machine Classifier

Last modified at Nov 17, 2022, 9:16 PM

Description: Model with highest accuracy

Created: Nov 15, 2022, 11:16 AM

Type: wml-hybrid_0.1

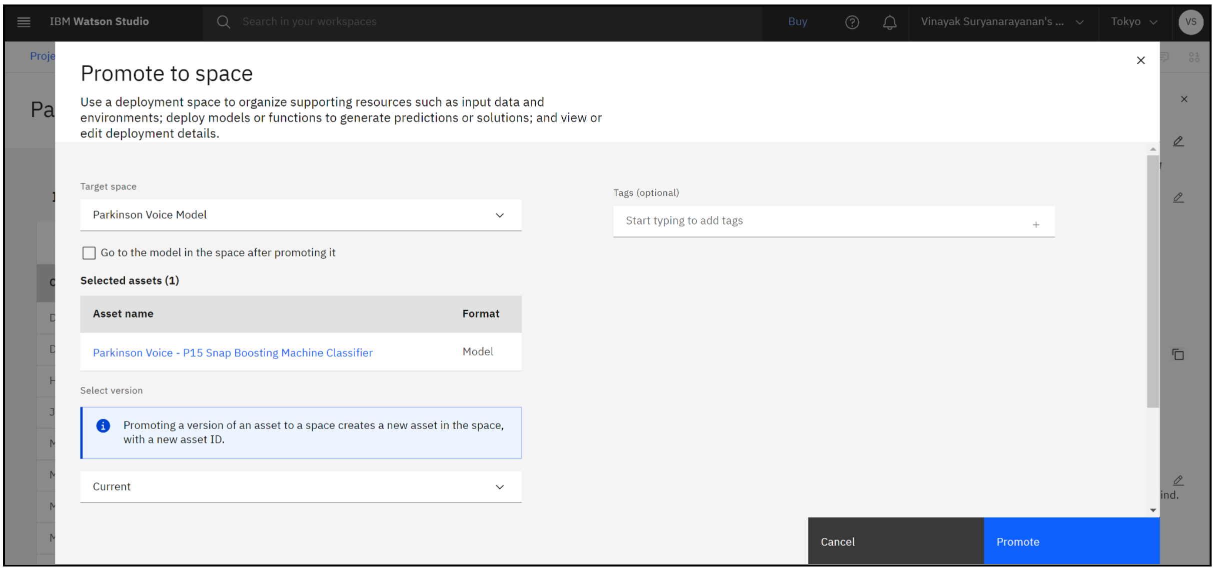
Model ID: 4cc70dc5-1ca8-4df2-a37e-20c...

Software specification: hybrid_0.1

Hybrid pipeline software specifications: autoai-kb_rt22.1-py3.9

Tags: Add tags to make assets easier to find.

Promoting To Deployment Space



Promote to space

Use a deployment space to organize supporting resources such as input data and environments; deploy models or functions to generate predictions or solutions; and view or edit deployment details.

Target space: Parkinson Voice Model

Tags (optional): Start typing to add tags

☐ Go to the model in the space after promoting it

Selected assets (1)

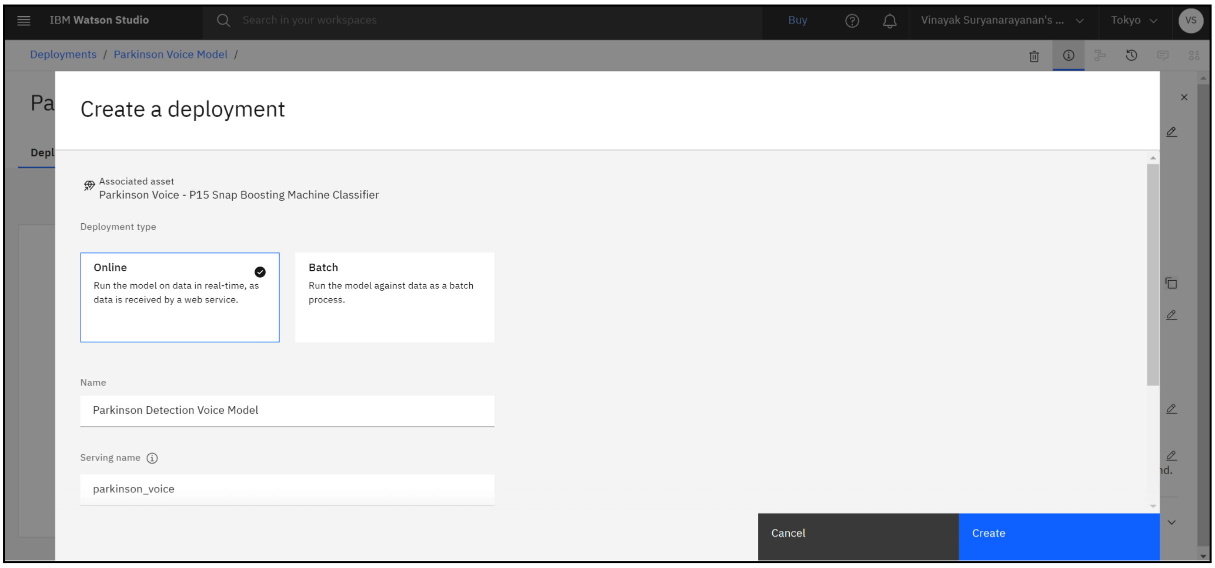
Asset name	Format
Parkinson Voice - P15 Snap Boosting Machine Classifier	Model

Select version

Promoting a version of an asset to a space creates a new asset in the space, with a new asset ID.

Current

Deployment



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Deployments / Parkinson Voice Model /
Cancel
Create

Create a deployment

Associated asset
Parkinson Voice - P15 Snap Boosting Machine Classifier

Deployment type

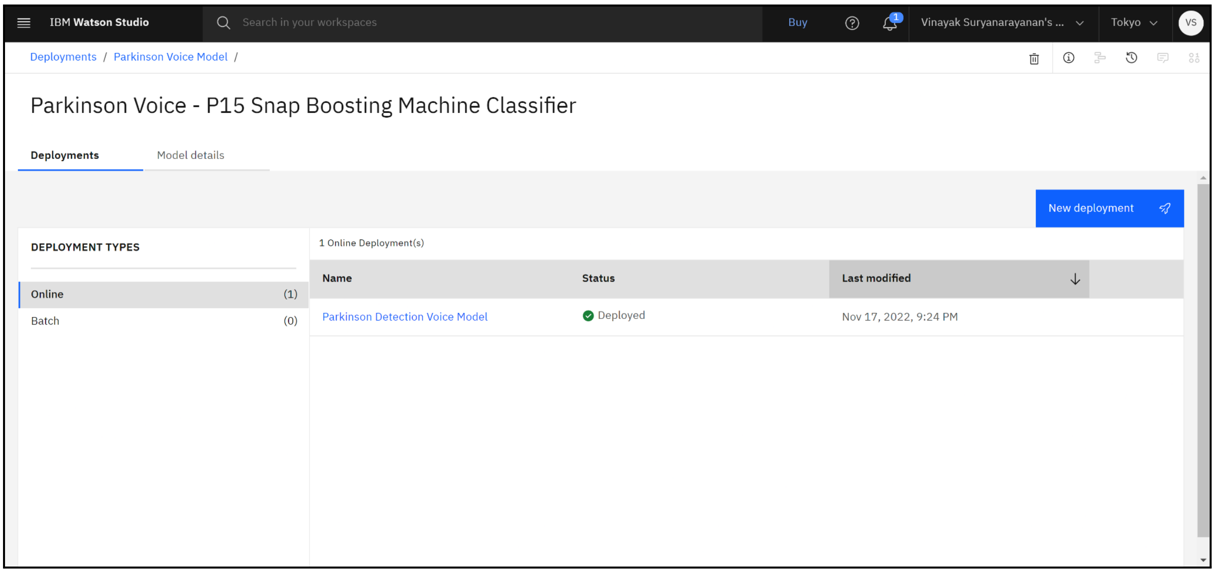
Online
Run the model on data in real-time, as data is received by a web service.

Batch
Run the model against data as a batch process.

Name
Parkinson Detection Voice Model

Serving name
parkinson_voice

Voice Model Deployed Successfully



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Deployments / Parkinson Voice Model /
Deployments
Model details
New deployment

Parkinson Voice - P15 Snap Boosting Machine Classifier

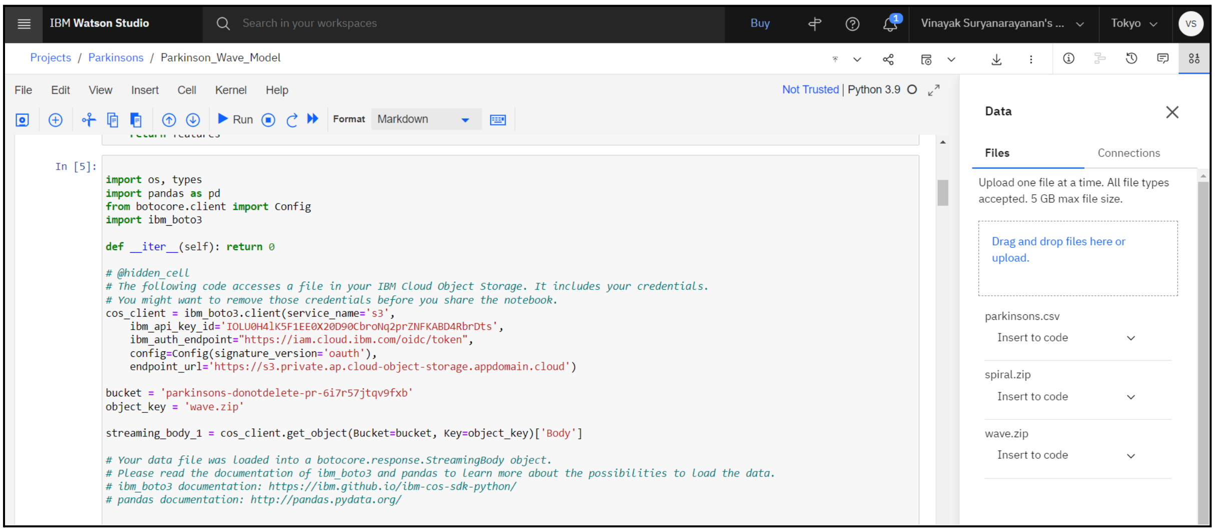
DEPLOYMENT TYPES

Online	(1)
Batch	(0)

1 Online Deployment(s)

Name	Status	Last modified
Parkinson Detection Voice Model	✓ Deployed	Nov 17, 2022, 9:24 PM

CODE FOR DEPLOYING CUSTOM MODEL



Upload one file at a time. All file types accepted. 5 GB max file size.

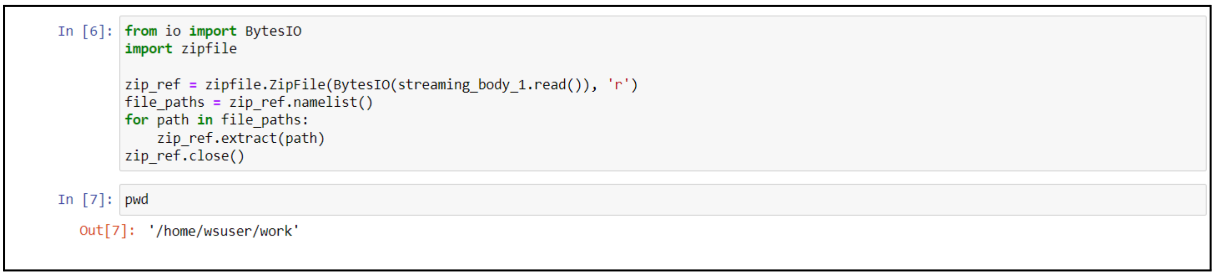
Drag and drop files here or upload.

parkinsons.csv

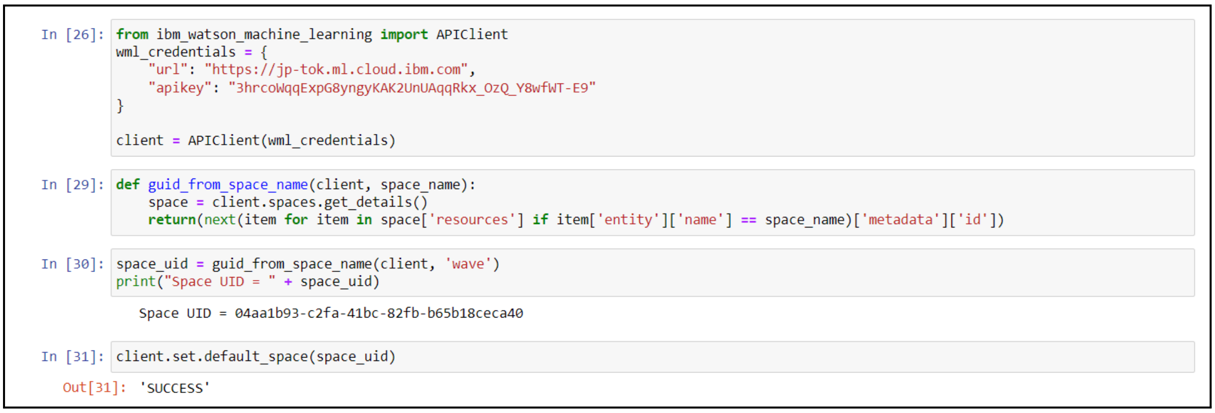
spiral.zip

wave.zip

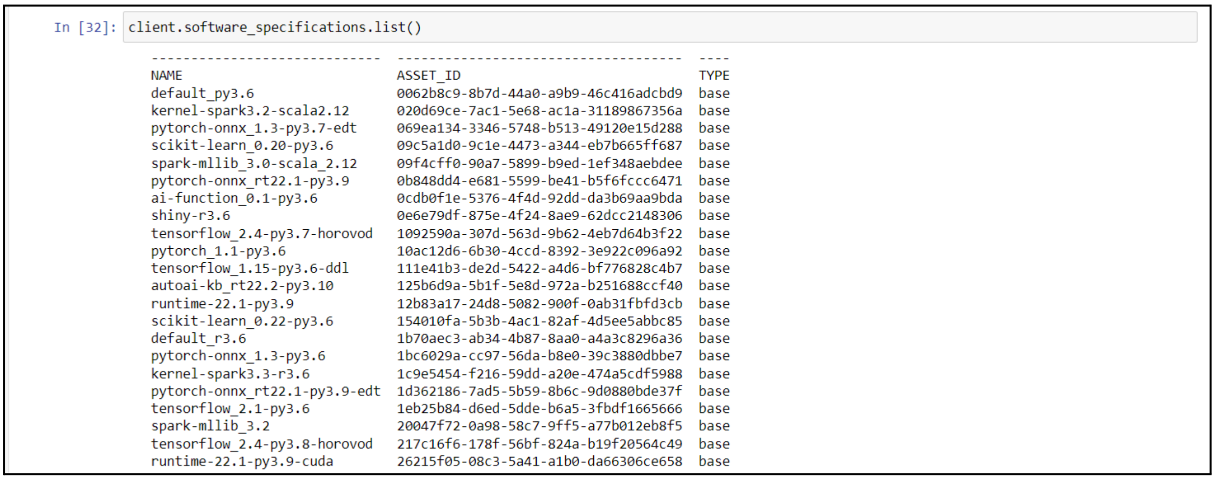
```
In [5]:
        import os, types
        import pandas as pd
        from botocore.client import Config
        import ibm_boto3

        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 = ibm_boto3.client(service_name='s3',
            ibm_api_key_id='IOLU0H4lK5F1EE0X20D90CbroNq2prZNFKABD4RbrDts',
            ibm_auth_endpoint="https://iam.cloud.ibm.com/oidc/token",
            config=Config(signature_version='oauth'),
            endpoint_url='https://s3.private.ap.cloud-object-storage.appdomain.cloud')

        bucket = 'parkinsons-donotdelete-pr-6i7r57jtqv9fxb'
        object_key = 'wave.zip'

        streaming_body_1 = cos_client.get_object(Bucket=bucket, Key=object_key)['Body']

        # Your data file was loaded into a botocore.response.StreamingBody object.
        # Please read the documentation of ibm_boto3 and pandas to learn more about the possibilities to load the data.
        # ibm_boto3 documentation: https://ibm.github.io/ibm-cos-sdk-python/
        # pandas documentation: http://pandas.pydata.org/
```



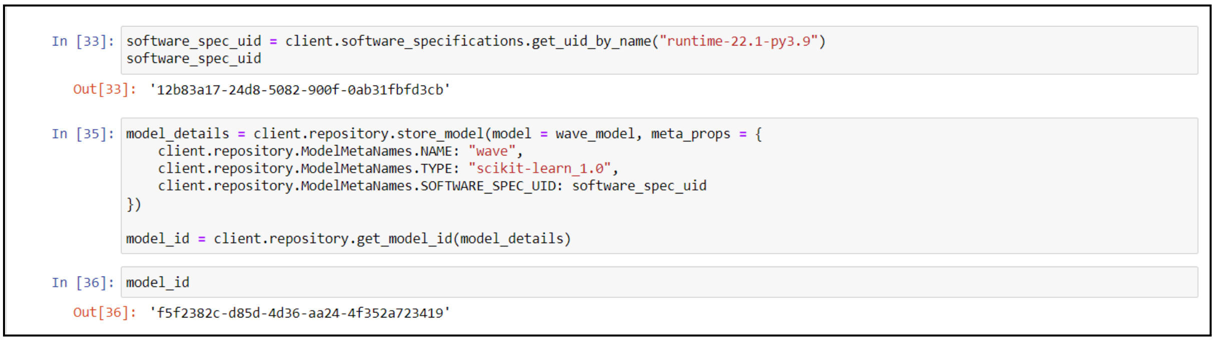
```
In [6]: from io import BytesIO
        import zipfile

        zip_ref = zipfile.ZipFile(BytesIO(streaming_body_1.read()), 'r')
        file_paths = zip_ref.namelist()
        for path in file_paths:
            zip_ref.extract(path)
        zip_ref.close()

In [7]: pwd

Out[7]: '/home/wsuser/work'
```



```
In [26]: from ibm_watson_machine_learning import APIClient
         wml_credentials = {
             "url": "https://jp-tok.ml.cloud.ibm.com",
             "apikey": "3hrcoWqqExpG8yngyKAK2UnUAqqRkx_OzQ_Y8wfWT-E9"
         }

         client = APIClient(wml_credentials)

In [29]: def guid_from_space_name(client, space_name):
             space = client.spaces.get_details()
             return(next(item for item in space['resources'] if item['entity']['name'] == space_name)['metadata']['id'])

In [30]: space_uid = guid_from_space_name(client, 'wave')
         print("Space UID = " + space_uid)

            Space UID = 04aa1b93-c2fa-41bc-82fb-b65b18ceca40

In [31]: client.set.default_space(space_uid)

Out[31]: 'SUCCESS'
```

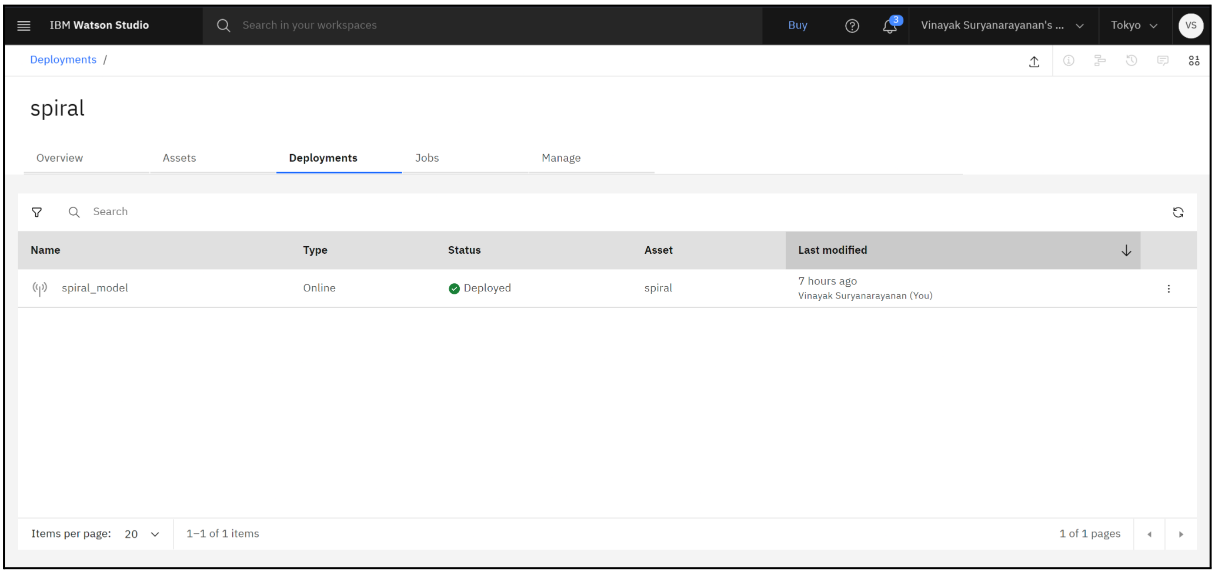


```
In [32]: client.software_specifications.list()

         ----------------------------  ------------------------------------  ----
         NAME                          ASSET_ID                              TYPE
         default_py3.6                 0062b8c9-8b7d-44a0-a9b9-46c416adcbd9  base
         kernel-spark3.2-scala2.12     020d69ce-7ac1-5e68-ac1a-31189867356a  base
         pytorch-onnx_1.3-py3.7-edt    069ea134-3346-5748-b513-49120e15d288  base
         scikit-learn_0.20-py3.6       09c5a1d0-9c1e-4473-a344-eb7b665ff687  base
         spark-mllib_3.0-scala_2.12    09f4cff0-90a7-5899-b9ed-1ef348aebdee  base
         pytorch-onnx_rt22.1-py3.9     0b848dd4-e681-5599-be41-b5f6fccc6471  base
         ai-function_0.1-py3.6         0cdb0f1e-5376-4f4d-92dd-da3b69aa9bda  base
         shiny-r3.6                    0e6e79df-875e-4f24-8ae9-62dcc2148306  base
         tensorflow_2.4-py3.7-horovod  1092590a-307d-563d-9b62-4eb7d64b3f22  base
         pytorch_1.1-py3.6             10ac12d6-6b30-4ccd-8392-3e922c096a92  base
         tensorflow_1.15-py3.6-ddl     111e41b3-de2d-5422-a4d6-bf776828c4b7  base
         autoai-kb_rt22.2-py3.10       125b6d9a-5b1f-5e8d-972a-b251688ccf40  base
         runtime-22.1-py3.9            12b83a17-24d8-5082-900f-0ab31fbfd3cb  base
         scikit-learn_0.22-py3.6       154010fa-5b3b-4ac1-82af-4d5ee5abbc85  base
         default_r3.6                  1b70aec3-ab34-4b87-8aa0-a4a3c8296a36  base
         pytorch-onnx_1.3-py3.6        1bc6029a-cc97-56da-b8e0-39c3880dbbe7  base
         kernel-spark3.3-r3.6          1c9e5454-f216-59dd-a20e-474a5cdf5988  base
         pytorch-onnx_rt22.1-py3.9-edt 1d362186-7ad5-5b59-8b6c-9d0880bde37f  base
         tensorflow_2.1-py3.6          1eb25b84-d6ed-5dde-b6a5-3fbdf1665666  base
         spark-mllib_3.2               20047f72-0a98-58c7-9ff5-a77b012eb8f5  base
         tensorflow_2.4-py3.8-horovod  217c16f6-178f-56bf-824a-b19f20564c49  base
         runtime-22.1-py3.9-cuda       26215f05-08c3-5a41-a1b0-da66306ce658  base
```



```
In [33]: software_spec_uid = client.software_specifications.get_uid_by_name("runtime-22.1-py3.9")
         software_spec_uid

Out[33]: '12b83a17-24d8-5082-900f-0ab31fbfd3cb'

In [35]: model_details = client.repository.store_model(model = wave_model, meta_props = {
             client.repository.ModelMetaNames.NAME: "wave",
             client.repository.ModelMetaNames.TYPE: "scikit-learn_1.0",
             client.repository.ModelMetaNames.SOFTWARE_SPEC_UID: software_spec_uid
         })

         model_id = client.repository.get_model_id(model_details)

In [36]: model_id

Out[36]: 'f5f2382c-d85d-4d36-aa24-4f352a723419'
```

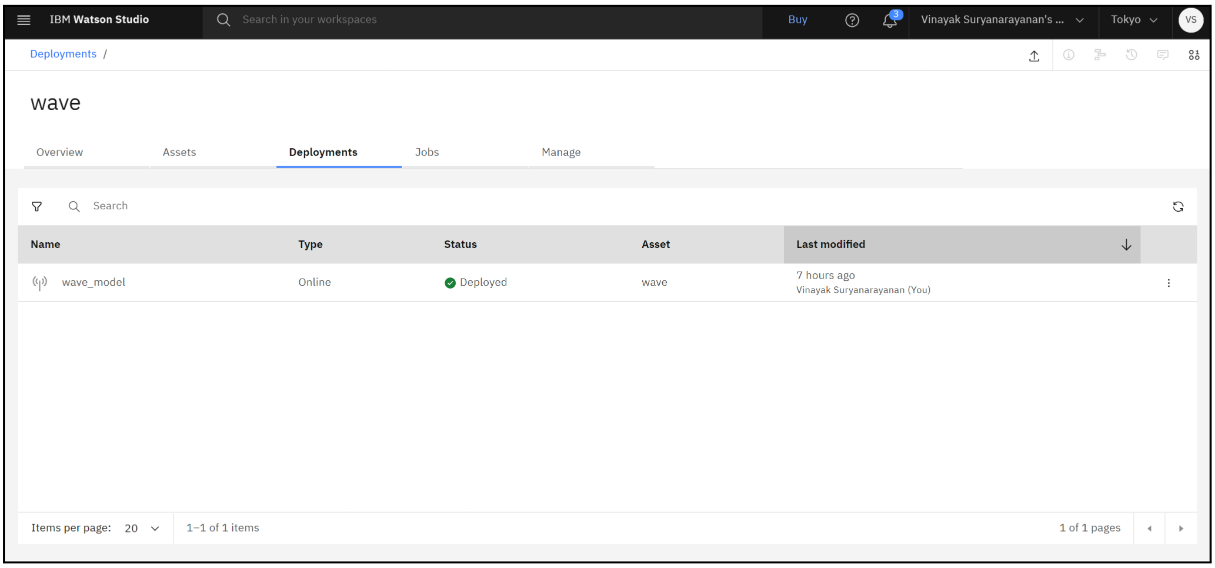
Spiral Model Deployed Successfully



spiral

Name	Type	Status	Asset	Last modified
spiral_model	Online	✓ Deployed	spiral	7 hours ago Vinayak Suryanarayanan (You)

Wave Model Deployed Successfully

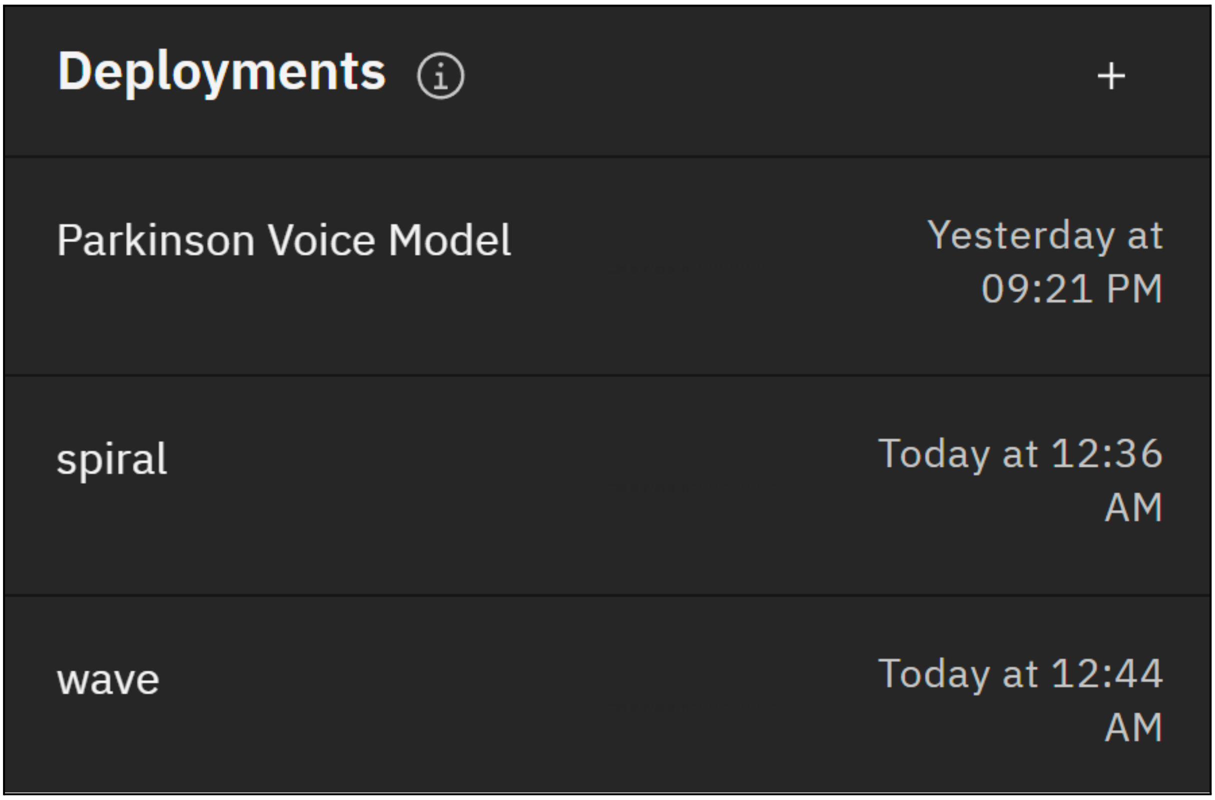


wave

Name	Type	Status	Asset	Last modified
wave_model	Online	● Deployed	wave	7 hours ago Vinayak Suryanarayanan (You)

Items per page: 20 1–1 of 1 items 1 of 1 pages

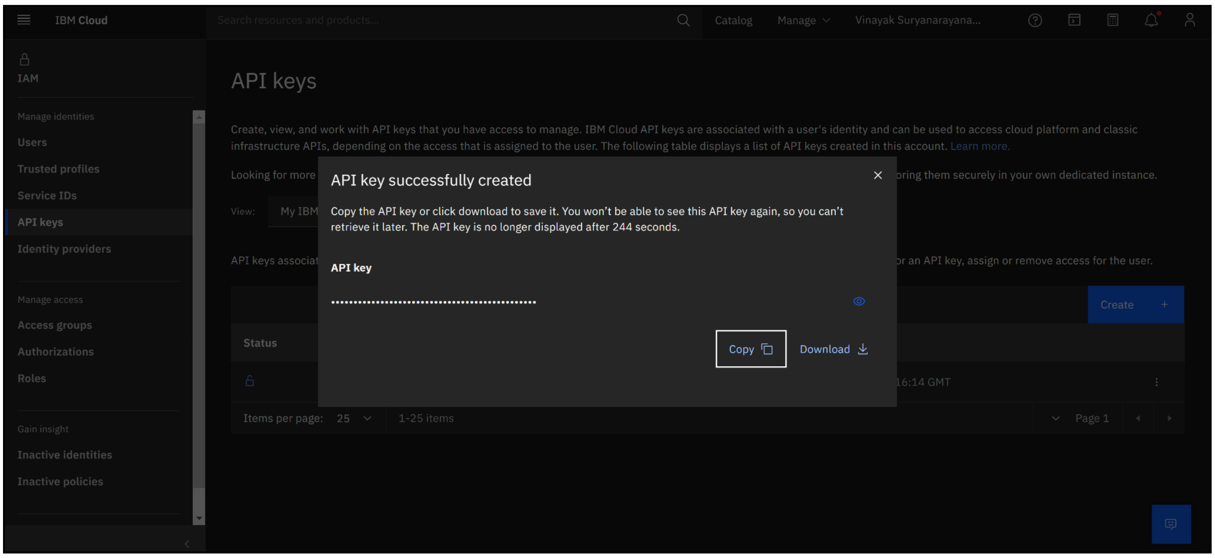
All Models For Parkinson's Disease Detection Has Been Deployed Successfully



Deployments

Parkinson Voice Model	Yesterday at 09:21 PM
spiral	Today at 12:36 AM
wave	Today at 12:44 AM

API KEY



API keys

Create, view, and work with API keys that you have access to manage. IBM Cloud API keys are associated with a user's identity and can be used to access cloud platform and classic infrastructure APIs, depending on the access that is assigned to the user. The following table displays a list of API keys created in this account. Learn more.

Looking for more … oring them securely in your own dedicated instance.

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API keys associat … or an API key, assign or remove access for the user.

API key successfully created

Copy the API key or click download to save it. You won't be able to see this API key again, so you can't retrieve it later. The API key is no longer displayed after 244 seconds.

API key

••

16:14 GMT

Items per page: 25 | 1-25 items | Page 1