Data Collection

> ## Download the Dataset

Image Pre-Processing

> ## Importing the Necessary Libraries

In [1]:
```
pwd
```

Out[1]:
```
'/home/wsuser/work'
```

In [2]:
```
!pip install imutils
```

```
Requirement already satisfied: imutils in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (0.5.4)
```

In [3]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
import zipfile as zf
import os
import random
import cv2
import pickle
from imutils import build_montages
from imutils import paths
from sklearn.metrics import classification_report,confusion_matrix
from sklearn import metrics
from sklearn.preprocessing import LabelEncoder,LabelBinarizer
from sklearn.model_selection import train_test_split
from sklearn.ensemble import RandomForestClassifier,GradientBoostingClassifier,ExtraTreesClassifier
from skimage import feature
```

In [4]:
```
sns.set()
os.getcwd()
```

Out[4]:
```
'/home/wsuser/work'
```

> ## Loading the training and testing dataset

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='9PBhSes0z9VA9j6pKAN6AEHf8eukFhEl9WfNRaxepkC5',
    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 = 'parkinsonsprediction-donotdelete-pr-tpmhf0fv6vnvyw'
object_key = 'spiral-20221112T063807Z-001.zip'

streaming_body_5 = 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
unzip = zipfile.ZipFile(BytesIO(streaming_body_5.read()),'r')
file_paths = unzip.namelist()
```

```
for path in file_paths:
    unzip.extract(path)
```

In [7]:

```
pwd
```

Out[7]:

```
'/home/wsuser/work'
```

In [8]:

```
filenames = os.listdir('/home/wsuser/work/spiral/training/')
```

In [9]:

```
spiral_train_healthy = os.listdir('/home/wsuser/work/spiral/training/healthy/')
spiral_train_park = os.listdir('/home/wsuser/work/spiral/training/parkinson/')

fp_spiral_train_healthy = '/home/wsuser/work/spiral/training/healthy/'
fp_spiral_train_park = '/home/wsuser/work/spiral/training/parkinson/'

spiral_test_healthy = os.listdir('/home/wsuser/work/spiral/testing/healthy/')
spiral_test_park = os.listdir('/home/wsuser/work/spiral/testing/parkinson/')

fp_spiral_test_healthy = '/home/wsuser/work/spiral/testing/healthy/'
fp_spiral_test_park = '/home/wsuser/work/spiral/testing/parkinson/'
```

Quantifying Images

In [10]:

```
def quantify_image(image):
  features = feature.hog(image,orientations=9,
                pixels_per_cell=(10,10),cells_per_block=(2,2),transform_sqrt=True,block_norm="L1")

  return features
```

Splitting up of training and testing data

In [11]:

```
trainX = []
testX = []
outputs = []
trainY = []
testY = []

for i in spiral_train_healthy:
  image = cv2.imread(fp_spiral_train_healthy+i)
  image = cv2.cvtColor(image , cv2.COLOR_BGR2GRAY)
  image = cv2.resize(image , (200,200))
  image =cv2.threshold(image, 0, 255,cv2.THRESH_BINARY_INV | cv2.THRESH_OTSU)[1]
  features = quantify_image(image)
  trainX.append(features)
  trainY.append('healthy')

for i in spiral_train_park:
  image = cv2.imread(fp_spiral_train_park+i)
  image = cv2.cvtColor(image , cv2.COLOR_BGR2GRAY)
  image = cv2.resize(image , (200,200))
  image = cv2.threshold(image ,0,255,cv2.THRESH_BINARY_INV | cv2.THRESH_OTSU)[1]
  features = quantify_image(image)
  trainX.append(features)
  trainY.append('parkinson')

for i in spiral_test_healthy:
  image = cv2.imread(fp_spiral_test_healthy+i)
  outputs.append(image)
  image = cv2.cvtColor(image , cv2.COLOR_BGR2GRAY)
  image = cv2.resize(image , (200,200))
  image = cv2.threshold(image ,0,255,cv2.THRESH_BINARY_INV | cv2.THRESH_OTSU)[1]
  features = quantify_image(image)
  testX.append(features)
  testY.append('healthy')

for i in spiral_test_park:
  image = cv2.imread(fp_spiral_test_park+i)
  outputs.append(image)
  image = cv2.cvtColor(image , cv2.COLOR_BGR2GRAY)
  image = cv2.resize(image , (200,200))
  image = cv2.threshold(image ,0,255,cv2.THRESH_BINARY_INV | cv2.THRESH_OTSU)[1]
  features = quantify_image(image)
  testX.append(features)
  testY.append('parkinson')
```

In [12]:

```
trainX = np.array(trainX)
testX = np.array(testX)
trainY = np.array(trainY)
testY = np.array(testY)
trainX
```

Out[12]:

```
array([[0., 0., 0., ..., 0., 0., 0.],
       [0., 0., 0., ..., 0., 0., 0.],
       [0., 0., 0., ..., 0., 0., 0.],
       ...,
       [0., 0., 0., ..., 0., 0., 0.],
       [0., 0., 0., ..., 0., 0., 0.],
       [0., 0., 0., ..., 0., 0., 0.]])
```

In [13]:

```
trainY
```

Out[13]:

```
array(['healthy', 'healthy', 'healthy', 'healthy', 'healthy', 'healthy',
       'healthy', 'healthy', 'healthy', 'healthy', 'healthy', 'healthy',
       'healthy', 'healthy', 'healthy', 'healthy', 'healthy', 'healthy',
       'healthy', 'healthy', 'healthy', 'healthy', 'healthy', 'healthy',
       'healthy', 'healthy', 'healthy', 'healthy', 'healthy', 'healthy',
       'healthy', 'healthy', 'healthy', 'healthy', 'healthy', 'healthy',
       'parkinson', 'parkinson', 'parkinson', 'parkinson', 'parkinson',
       'parkinson', 'parkinson', 'parkinson', 'parkinson', 'parkinson',
       'parkinson', 'parkinson', 'parkinson', 'parkinson', 'parkinson',
       'parkinson', 'parkinson', 'parkinson', 'parkinson', 'parkinson',
       'parkinson', 'parkinson', 'parkinson', 'parkinson', 'parkinson',
       'parkinson', 'parkinson', 'parkinson', 'parkinson', 'parkinson',
       'parkinson', 'parkinson', 'parkinson', 'parkinson', 'parkinson',
       'parkinson'], dtype='<U9')
```

In [14]:

```
testX
```

Out[14]:

```
array([[0., 0., 0., ..., 0., 0., 0.],
       [0., 0., 0., ..., 0., 0., 0.],
       [0., 0., 0., ..., 0., 0., 0.],
       ...,
       [0., 0., 0., ..., 0., 0., 0.],
       [0., 0., 0., ..., 0., 0., 0.],
       [0., 0., 0., ..., 0., 0., 0.]])
```

In [15]:

```
testY
```

Out[15]:

```
array(['healthy', 'healthy', 'healthy', 'healthy', 'healthy', 'healthy',
       'healthy', 'healthy', 'healthy', 'healthy', 'healthy', 'healthy',
       'healthy', 'healthy', 'healthy', 'parkinson', 'parkinson',
       'parkinson', 'parkinson', 'parkinson', 'parkinson', 'parkinson',
       'parkinson', 'parkinson', 'parkinson', 'parkinson', 'parkinson',
       'parkinson', 'parkinson', 'parkinson'], dtype='<U9')
```

Label Encoding

In [16]:

```
le = LabelEncoder()
trainY = le.fit_transform(trainY)
testY = le.transform(testY)
print(trainX.shape,trainY.shape)
```

```
(72, 12996) (72,)
```

In [17]:

```
trainY
```

Out[17]:

```
array([0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0,
       0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 1, 1, 1,
       1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1, 1,
       1, 1, 1, 1, 1, 1])
```

In [18]:

```
testY
```

Out[18]:

```
array([0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 1, 1,
       1, 1, 1, 1, 1, 1, 1, 1])
```

Model Building

Training the model

In [38]:

```
print("Training model....")
model = RandomForestClassifier(n_estimators=100)
model.fit(trainX,trainY)
```

```
Training model....
```

Out[38]:

```
RandomForestClassifier()
```

In [39]:

```python
preds = model.predict(testX)
preds
```

Out[39]:

```
array([1, 0, 1, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 1, 1, 1, 1, 1, 1,
       1, 0, 1, 1, 1, 0, 0, 1])
```

Model Evaluation

In [40]:

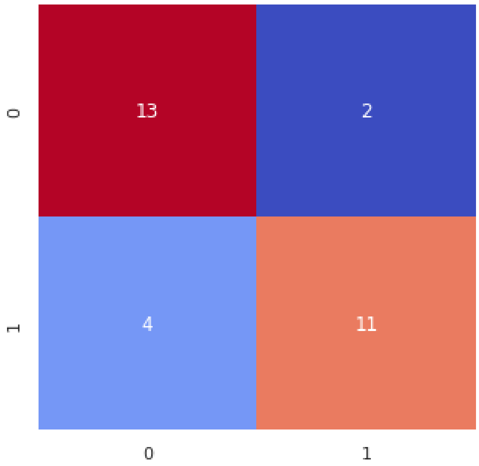
```python
cnf = confusion_matrix(testY,preds)
cnf
```

Out[40]:

```
array([[13,  2],
       [ 4, 11]])
```

In [33]:

```python
plt.figure(figsize=(5,5))
sns.heatmap(cnf , annot=True , cmap="coolwarm" , cbar=False)
plt.show()
```



In [34]:

```python
acc = metrics.accuracy_score(testY,preds)
acc
```

Out[34]:

```
0.8
```

In [35]:

```python
indexes = np.random.randint(0,30,25)
indexes
```

Out[35]:

```
array([ 5,  4,  9, 14, 25, 19,  5, 25,  1, 22, 10, 26,  1, 13, 17, 24, 28,
       13, 20, 12,  9, 11, 27, 10, 22])
```

Testing the Model

In [36]:

```python
testpath=list(paths.list_images(fp_spiral_train_healthy))
idxs=np.arange(0,len(testpath))
idxs=np.random.choice(idxs,size=(25,),replace=False)
images=[]

for i in idxs:
    image=cv2.imread(testpath[i])
    output=image.copy()
    output=cv2.resize(output,(128,128))
    image=cv2.cvtColor(image,cv2.COLOR_BGR2GRAY)
    image=cv2.resize(image,(200,200))
    image=cv2.threshold(image,0,255,cv2.THRESH_BINARY_INV | cv2.THRESH_OTSU)[1]

    features= quantify_image(image)
    preds=model.predict([features])
    label=le.inverse_transform(preds)[0]
    if label=="healthy":
      color=(0,255,0)
    else:
      (0,0,255)
    cv2.putText(output,label, (3,20),cv2.FONT_HERSHEY_SIMPLEX,0.5,color,2)
    images.append(output)
```

In [95]:

```python
!pip install opencv-python
```

```
Collecting opencv-python
  Downloading opencv_python-4.6.0.66-cp36-abi3-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (60.9 MB)
     |████████████████████████████████| 60.9 MB 25.9 MB/s eta 0:00:01
Requirement already satisfied: numpy>=1.14.5 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from opencv
-python) (1.20.3)
Installing collected packages: opencv-python
Successfully installed opencv-python-4.6.0.66
```

In [96]:

```
montage = build_montages(images,(128,128),(5,5))[0]
cv2.imshow("Output",montage)
cv2.waitKey(0)
'''
montage=build_montages(images,(128,128),(5,5))[0]
cv2_imshow(montage)
cv2.waitKey(0)
'''
```

```
---------------------------------------------------------------------------
error                                     Traceback (most recent call last)
/tmp/wsuser/ipykernel_164/3795390558.py in <module>
      1 montage = build_montages(images,(128,128),(5,5))[0]
----> 2 cv2.imshow("Output",montage)
      3 cv2.waitKey(0)
      4 '''
      5 montage=build_montages(images,(128,128),(5,5))[0]

error: OpenCV(4.5.5) ../modules/highgui/src/window.cpp:1268: error: (-2:Unspecified error) The function is not impl
emented. Rebuild the library with Windows, GTK+ 2.x or Cocoa support. If you are on Ubuntu or Debian, install libgt
k2.0-dev and pkg-config, then re-run cmake or configure script in function 'cvShowImage'
```

Predicting the model-Accuracy and Confusion Matrix

In [37]:

```
predictions = model.predict(testX)

cm = confusion_matrix(testY, predictions).flatten()
print(cm)
(tn, fp, fn, tp) = cm
accuracy = (tp + tn) / float(cm.sum())
print(accuracy)
```

```
[13  2  4 11]
0.8
```

Save the Model

In [41]:

```
pickle.dump(model,open('parkinson.pkl','wb'))
```

In [42]:

```
!tar -zcvf parkinsons-model_new.tgz parkinson.pkl
```

```
parkinson.pkl
```

In [43]:

```
ls
```

```
parkinson.pkl  parkinsons-model_new.tgz  parkinsons_model.tar.gz  spiral/
```

In [44]:

```
!pip install watson-machine-learning-client --upgrade
```

```
Requirement already satisfied: watson-machine-learning-client in /opt/conda/envs/Python-3.9/lib/python3.9/site-pack
ages (1.0.391)
Requirement already satisfied: requests in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-mach
ine-learning-client) (2.26.0)
Requirement already satisfied: pandas in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machin
e-learning-client) (1.3.4)
Requirement already satisfied: certifi in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machi
ne-learning-client) (2022.9.24)
Requirement already satisfied: urllib3 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machi
ne-learning-client) (1.26.7)
Requirement already satisfied: tqdm in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-
learning-client) (4.62.3)
Requirement already satisfied: tabulate in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-mach
ine-learning-client) (0.8.9)
Requirement already satisfied: boto3 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine
-learning-client) (1.18.21)
Requirement already satisfied: ibm-cos-sdk in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-m
achine-learning-client) (2.11.0)
Requirement already satisfied: lomond in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machin
e-learning-client) (0.3.3)
Requirement already satisfied: botocore<1.22.0,>=1.21.21 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages
(from boto3->watson-machine-learning-client) (1.21.41)
Requirement already satisfied: s3transfer<0.6.0,>=0.5.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages
(from boto3->watson-machine-learning-client) (0.5.0)
Requirement already satisfied: jmespath<1.0.0,>=0.7.1 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (fr
om boto3->watson-machine-learning-client) (0.10.0)
Requirement already satisfied: python-dateutil<3.0.0,>=2.1 in /opt/conda/envs/Python-3.9/lib/python3.9/site-package
s (from botocore<1.22.0,>=1.21.21->boto3->watson-machine-learning-client) (2.8.2)
Requirement already satisfied: six>=1.5 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from python-date
util<3.0.0,>=2.1->botocore<1.22.0,>=1.21.21->boto3->watson-machine-learning-client) (1.15.0)
Requirement already satisfied: ibm-cos-sdk-s3transfer==2.11.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-pack
ages (from ibm-cos-sdk->watson-machine-learning-client) (2.11.0)
Requirement already satisfied: ibm-cos-sdk-core==2.11.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages
(from ibm-cos-sdk->watson-machine-learning-client) (2.11.0)
Requirement already satisfied: idna<4,>=2.5 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from request
s->watson-machine-learning-client) (3.3)
Requirement already satisfied: charset-normalizer~=2.0.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages
(from requests->watson-machine-learning-client) (2.0.4)
Requirement already satisfied: pytz>=2017.3 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from pandas-
>watson-machine-learning-client) (2021.3)
Requirement already satisfied: numpy>=1.17.3 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from pandas
->watson-machine-learning-client) (1.20.3)
```

In [45]:

```python
from ibm_watson_machine_learning import APIClient
wml_credentials = {
    "url":"https://us-south.ml.cloud.ibm.com",
    "apikey":"qCp1VQAqMTPikiYRALscUVshlebbUbGLitQkAiWaBtIz"
}
client = APIClient(wml_credentials)
```

In [46]:

```python
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 [47]:

```python
space_uid = guid_from_space_name(client,'ParkinsonsPrediction_Space')
print(space_uid)
```

```
1c89246d-042b-40ae-a78b-1f8446569702
```

In [48]:

```python
client.set.default_space(space_uid)
```

Out[48]:

```
'SUCCESS'
```

In [49]:

```python
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
do_py3.8                       295addb5-9ef9-547e-9bf4-92ae3563e720  base
autoai-ts_3.8-py3.8            2aa0c932-798f-5ae9-abd6-15e0c2402fb5  base
tensorflow_1.15-py3.6          2b73a275-7cbf-420b-a912-eae7f436e0bc  base
kernel-spark3.3-py3.9          2b7961e2-e3b1-5a8c-a491-482c8368839a  base
pytorch_1.2-py3.6              2c8ef57d-2687-4b7d-acce-01f94976dac1  base
spark-mllib_2.3                2e51f700-bca0-4b0d-88dc-5c6791338875  base
pytorch-onnx_1.1-py3.6-edt     32983cea-3f32-4400-8965-dde874a8d67e  base
spark-mllib_3.0-py37           36507ebe-8770-55ba-ab2a-eafe787600e9  base
spark-mllib_2.4                390d21f8-e58b-4fac-9c55-d7ceda621326  base
autoai-ts_rt22.2-py3.10        396b2e83-0953-5b86-9a55-7ce1628a406f  base
xgboost_0.82-py3.6             39e31acd-5f30-41dc-ae44-60233c80306e  base
pytorch-onnx_1.2-py3.6-edt     40589d0e-7019-4e28-8daa-fb03b6f4fe12  base
pytorch-onnx_rt22.2-py3.10     40e73f55-783a-5535-b3fa-0c8b94291431  base
default_r36py38                41c247d3-45f8-5a71-b065-8580229facf0  base
autoai-ts_rt22.1-py3.9         4269d26e-07ba-5d40-8f66-2d495b0c71f7  base
autoai-obm_3.0                 42b92e18-d9ab-567f-988a-4240ba1ed5f7  base
pmml-3.0_4.3                   493bcb95-16f1-5bc5-bee8-81b8af80e9c7  base
spark-mllib_2.4-r_3.6          49403dff-92e9-4c87-a3d7-a42d0021c095  base
xgboost_0.90-py3.6             4ff8d6c2-1343-4c18-85e1-689c965304d3  base
pytorch-onnx_1.1-py3.6         50f95b2a-bc16-43bb-bc94-b0bed208c60b  base
autoai-ts_3.9-py3.8            52c57136-80fa-572e-8728-a5e7cbb42cde  base
spark-mllib_2.4-scala_2.11     55a70f99-7320-4be5-9fb9-9edb5a443af5  base
spark-mllib_3.0                5c1b0ca2-4977-5c2e-9439-ffd44ea8ffe9  base
autoai-obm_2.0                 5c2e37fa-80b8-5e77-840f-d912469614ee  base
spss-modeler_18.1              5c3cad7e-507f-4b2a-a9a3-ab53a21dee8b  base
cuda-py3.8                     5d3232bf-c86b-5df4-a2cd-7bb870a1cd4e  base
autoai-kb_3.1-py3.7            632d4b22-10aa-5180-88f0-f52dfb6444d7  base
pytorch-onnx_1.7-py3.8         634d3cdc-b562-5bf9-a2d4-ea90a478456b  base
-----------------------------  ------------------------------------  ----
Note: Only first 50 records were displayed. To display more use 'limit' parameter.
```

In [50]:

```
software_spec_uid = client.software_specifications.get_uid_by_name('runtime-22.1-py3.9')
software_spec_uid
```

Out[50]:

```
'12b83a17-24d8-5082-900f-0ab31fbfd3cb'
```

In [51]:

```
model_details = client.repository.store_model(model='parkinsons-model_new.tgz',meta_props={
    client.repository.ModelMetaNames.NAME:"RandomForest",
    client.repository.ModelMetaNames.TYPE:"xgboost_1.5",
    client.repository.ModelMetaNames.SOFTWARE_SPEC_UID:software_spec_uid
})
model_id = client.repository.get_model_uid(model_details)
```

```
This method is deprecated, please use get_model_id()
```

```
/opt/conda/envs/Python-3.9/lib/python3.9/site-packages/ibm_watson_machine_learning/repository.py:1453: UserWarning:
This method is deprecated, please use get_model_id()
  warn("This method is deprecated, please use get_model_id()")
```

In [53]:

```
model_id
```

Out[53]:

```
'552baa6f-c154-4ddd-b38b-43db30b63439'
```

In [54]:

```
client.repository.download("552baa6f-c154-4ddd-b38b-43db30b63439", 'parkinsons.tar.gz')
```

```
Successfully saved model content to file: 'parkinsons.tar.gz'
```

Out[54]:

```
'/home/wsuser/work/parkinsons.tar.gz'
```