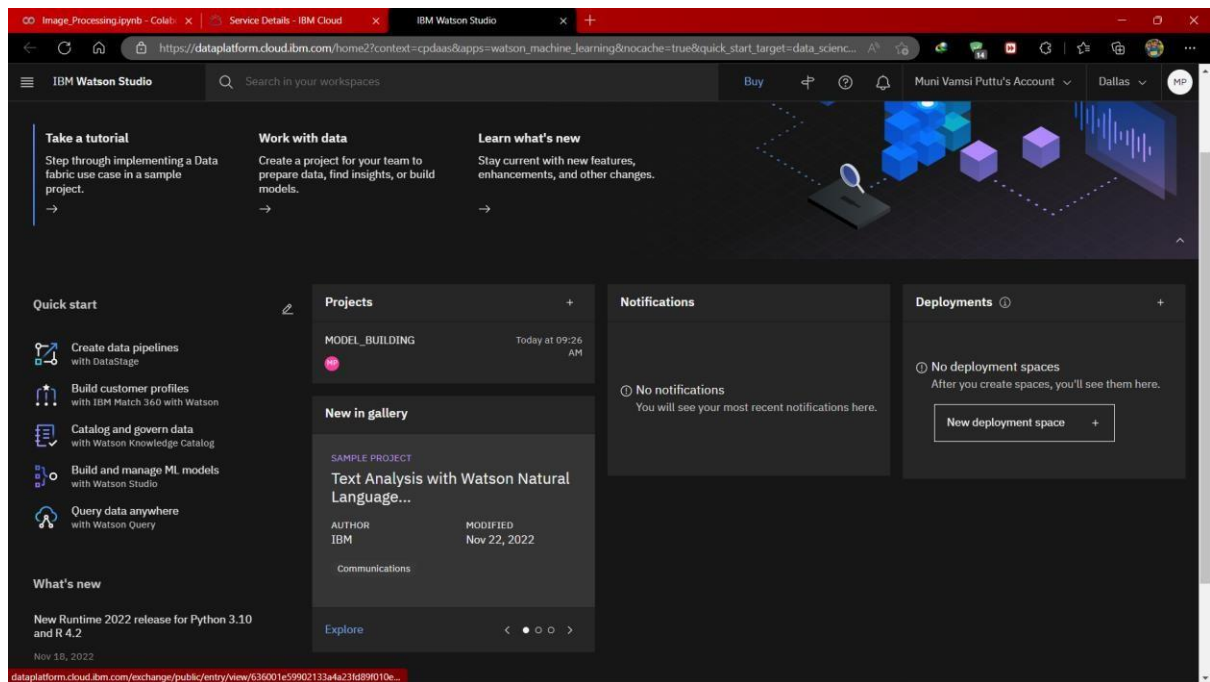
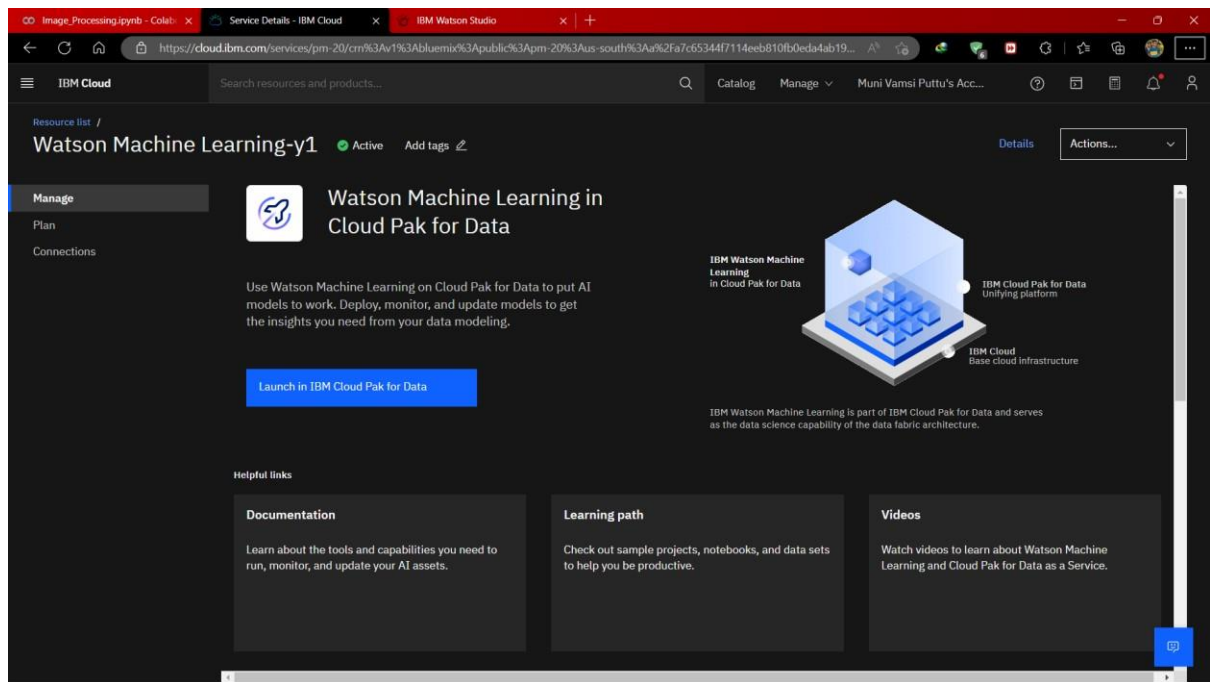


Train Model On IBM

TEAM ID: PNT2022TMID16460

PROJECT NAME: AI-powered Nutrition Analyzer for Fitness Enthusiasts



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MODEL Notebook	10 minutes ago Modified by you
Dataset.zip application/x-zip-compressed	3 hours ago Modified by you

Data in this project

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```
In [169]: pwd
Out[169]: '/home/wuser/work'

In [170]: !pip install keras
!pip install tensorflow

Requirement already satisfied: keras in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (2.7.0)
Requirement already satisfied: tensorflow in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (2.7.2)
Requirement already satisfied: flatbuffers<3.0,>=1.12 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (2.0)
Requirement already satisfied: wheel<1.0,>=0.32.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (0.37.0)
Requirement already satisfied: tensorflow-estimator<2.8,==2.7.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (2.7.0)
Requirement already satisfied: typing-extensions>=3.6.6 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (4.1.1)
Requirement already satisfied: numpy>=1.14.5 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.20.3)
Requirement already satisfied: gast<0.5.0,>=0.2.1 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (0.4.0)
Requirement already satisfied: termcolor>=1.1.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.1.0)
Requirement already satisfied: tensorboard==2.7 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (2.7.0)
Requirement already satisfied: wrapt>=1.11.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.12.1)
Requirement already satisfied: grpcio<2.0,>=1.24.3 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.42.0)
Requirement already satisfied: six>=1.12.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.15.0)
Requirement already satisfied: astunparse>=1.6.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.6.3)
Requirement already satisfied: keras<2.8,>=2.7.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (2.7.0)
Requirement already satisfied: protobuf>=3.9.2 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (3.19.1)
Requirement already satisfied: h5py>=2.9.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (3.2.1)
Requirement already satisfied: tensorflow-io-gcs-filesystem==0.23.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (0.23.1)
Requirement already satisfied: google-pasta>=0.1.1 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (0.2.0)
Requirement already satisfied: absl-py>=0.4.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (0.12.0)
Requirement already satisfied: keras-preprocessing>=1.1.1 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.1.2)
Requirement already satisfied: opt-einsum>=2.3.2 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (3.3.0)
Requirement already satisfied: google-auth-oauthlib<0.5,>=0.4.1 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorboard==2.7->tensorflow) (0.4.4)
Requirement already satisfied: setuptools>=41.0.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorboard==2.7->tensorflow) (58.0.4)
Requirement already satisfied: tensorboard-data-server<0.7.0,>=0.6.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorboard==2.7->tensorflow) (0.6.1)
Requirement already satisfied: werkzeug>=0.11.15 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorboard==2.7->tensorflow) (2.0.2)
Requirement already satisfied: markdown>=2.6.8 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorboard==2.7->tensorflow) (3.3.3)
```

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In [171]: from keras.models import Sequential # api, se,
          from keras.layers import Dense # add Layers
          from keras.layers import Convolution2D # con
          from keras.layers import MaxPooling2D
          from keras.layers import Flatten
          import tensorflow as tf

In [172]: from keras.preprocessing.image import ImageDataGenerator

In [ ]:

In [173]: train_datagen=ImageDataGenerator(rescale=1./255, shear_range=0.2, zoom_range=0.2, horizontal_flip=True)
          test_datagen = ImageDataGenerator(rescale=1./255)

In [174]: import os, types
          import pandas as pd
          from boto3.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='IjN163hKXrLS9SV9360wVCja_HoW8Vv-fSImEF101Vh',
                                     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')
```

```
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In [175]: from io import BytesIO
          import zipfile
          unzip=zipfile.ZipFile(BytesIO(streaming_body_9.read()), 'r')
          file_paths = unzip.namelist()
          for path in file_paths:
              unzip.extract(path)

In [176]: pwd
          Out[176]: '/home/wsuser/work'

In [177]: import os
          filenames=os.listdir('/home/wsuser/work/Dataset/TRAIN_SET')

In [178]: x_train=train_datagen.flow_from_directory(
          "/home/wsuser/work/Dataset/TRAIN_SET",
          target_size=(64,64), batch_size=5,color_mode='rgb',class_mode='sparse')
          x_test=test_datagen.flow_from_directory(
          "/home/wsuser/work/Dataset/TEST_SET",
          target_size=(64,64),batch_size=5,color_mode='rgb',class_mode='sparse')

          Found 2626 images belonging to 5 classes.
          Found 1055 images belonging to 5 classes.

In [179]: print(x_train.class_indices)
          {'APPLES': 0, 'BANANA': 1, 'ORANGE': 2, 'PINEAPPLE': 3, 'WATERMELON': 4}

In [180]: print(x_test.class_indices)
          {'APPLES': 0, 'BANANA': 1, 'ORANGE': 2, 'PINEAPPLE': 3, 'WATERMELON': 4}

In [181]: from collections import Counter as c
```

```
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In [180]: print(x_test.class_indices)
{'APPLES': 0, 'BANANA': 1, 'ORANGE': 2, 'PINEAPPLE': 3, 'WATERMELON': 4}

In [181]: from collections import Counter as c
c(x_train.labels)
Out[181]: Counter({0: 606, 1: 445, 2: 479, 3: 621, 4: 475})

In [182]: import numpy as np
import tensorflow
from tensorflow.keras.models import Sequential
from tensorflow.keras.layers import layers
from tensorflow.keras.layers import Dense, Flatten
from tensorflow.keras.layers import Conv2D, MaxPooling2D, Dropout
from keras.preprocessing.image import ImageDataGenerator

In [183]: model=Sequential()

In [184]: classifier=Sequential()
classifier.add(Conv2D(32,(3,3),input_shape=(64,64,3),activation='relu'))
classifier.add(MaxPooling2D(pool_size=(2,2)))
classifier.add(Conv2D(32,(3,3),activation='relu'))
classifier.add(MaxPooling2D(pool_size=(2,2)))
classifier.add(Flatten())

In [185]: classifier.add(Dense(units=128, activation='relu'))
classifier.add(Dense(units=5, activation='softmax'))

In [186]: classifier.summary()
Model: "sequential_3"
```

```
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classifier.add(Flatten())

In [185]: classifier.add(Dense(units=128, activation='relu'))
classifier.add(Dense(units=5, activation='softmax'))

In [186]: classifier.summary()
Model: "sequential_3"
Layer (type) Output Shape Param #
-----
conv2d_2 (Conv2D) (None, 62, 62, 32) 896
max_pooling2d_2 (MaxPooling (None, 31, 31, 32) 0
2D)
conv2d_3 (Conv2D) (None, 29, 29, 32) 9248
max_pooling2d_3 (MaxPooling (None, 14, 14, 32) 0
2D)
flatten_1 (Flatten) (None, 6272) 0
dense_2 (Dense) (None, 128) 802944
dense_3 (Dense) (None, 5) 645
-----
Total params: 813,733
Trainable params: 813,733
Non-trainable params: 0

In [187]: classifier.compile(optimizer='adam',loss='sparse_categorical_crossentropy',metrics=['accuracy'])
```



```
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In [188]: classifier.fit_generator(
    generator=x_train, steps_per_epoch=len(x_train),
    epochs=20, validation_data=x_test, validation_steps=len(x_test))

/tmp/wsuser/ipykernel_472/2842017323.py:1: UserWarning: 'Model.fit_generator' is deprecated and will be removed in a future version. Please use 'Model.fit', which supports generators.
  classifier.fit_generator(

Epoch 1/20
526/526 [=====] - 28s 53ms/step - loss: 0.1826 - accuracy: 0.9322 - val_loss: 0.0428 - val_accuracy: 0.9858
Epoch 2/20
526/526 [=====] - 28s 53ms/step - loss: 0.0179 - accuracy: 0.9939 - val_loss: 0.0202 - val_accuracy: 0.9896
Epoch 3/20
526/526 [=====] - 28s 53ms/step - loss: 3.2540e-04 - accuracy: 1.0000 - val_loss: 0.0139 - val_accuracy: 0.9905
Epoch 4/20
526/526 [=====] - 28s 54ms/step - loss: 1.1100e-04 - accuracy: 1.0000 - val_loss: 0.0142 - val_accuracy: 0.9905
Epoch 5/20
526/526 [=====] - 28s 53ms/step - loss: 5.4567e-05 - accuracy: 1.0000 - val_loss: 0.0181 - val_accuracy: 0.9896
Epoch 6/20
526/526 [=====] - 28s 54ms/step - loss: 0.0968 - accuracy: 0.9775 - val_loss: 0.0774 - val_accuracy: 0.9678
Epoch 7/20
526/526 [=====] - 27s 51ms/step - loss: 0.0101 - accuracy: 0.9962 - val_loss: 0.1206 - val_accuracy: 0.9573
Epoch 8/20
526/526 [=====] - 27s 51ms/step - loss: 8.2041e-05 - accuracy: 1.0000 - val_loss: 0.0989 - val_accuracy: 0.9649
Epoch 9/20
526/526 [=====] - 27s 52ms/step - loss: 5.8627e-05 - accuracy: 1.0000 - val_loss: 0.0845 - val_accuracy: 0.9668
Epoch 10/20
526/526 [=====] - 28s 52ms/step - loss: 3.8069e-05 - accuracy: 1.0000 - val_loss: 0.0910 - val_accuracy: 0.9649
Epoch 11/20
526/526 [=====] - 30s 56ms/step - loss: 1.9055e-05 - accuracy: 1.0000 - val_loss: 0.0738 - val_accuracy: 0.9668
Epoch 12/20
526/526 [=====] - 28s 54ms/step - loss: 1.4978e-05 - accuracy: 1.0000 - val_loss: 0.0694 - val_accuracy: 0.9668
Epoch 13/20
526/526 [=====] - 27s 51ms/step - loss: 1.0957e-05 - accuracy: 1.0000 - val_loss: 0.0726 - val_accuracy: 0.9668
Epoch 14/20
526/526 [=====] - 28s 54ms/step - loss: 8.0734e-06 - accuracy: 1.0000 - val_loss: 0.0671 - val_accuracy: 0.9668
```

```
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Epoch 17/20
526/526 [=====] - 28s 54ms/step - loss: 3.9513e-06 - accuracy: 1.0000 - val_loss: 0.0507 - val_accuracy: 0.9791
Epoch 18/20
526/526 [=====] - 29s 55ms/step - loss: 3.7680e-06 - accuracy: 1.0000 - val_loss: 0.0306 - val_accuracy: 0.9924
Epoch 19/20
526/526 [=====] - 29s 55ms/step - loss: 3.0557e-06 - accuracy: 1.0000 - val_loss: 0.0449 - val_accuracy: 0.9877
Epoch 20/20
526/526 [=====] - 28s 52ms/step - loss: 1.7748e-06 - accuracy: 1.0000 - val_loss: 0.0450 - val_accuracy: 0.9886

Out[188]: <keras.callbacks.History at 0x7feef81f47f0>

In [189]: classifier.save('nutrition.h5')

In [190]: import tensorflow
from tensorflow.keras.models import load_model
from keras.preprocessing import image
from tensorflow.keras.utils import load_img, img_to_array
model = load_model("nutrition.h5")

In [ ]: import numpy as np
img = tensorflow.keras.utils.load_img('/home/wsuser/work/Dataset/TRAIN_SET/APPLES/r_8_100.jpg',
    grayscale=False, target_size=(64,64))
x = tensorflow.keras.utils.img_to_array(img)

x = np.expand_dims(x, axis = 0)
pred = model.predict_classes(x)
classes_x = np.argmax(pred, axis=-1)
classes_x

In [ ]: index=['APPLES', 'BANANA', 'ORANGE', 'PINEAPPLE', 'WATERMELON']
result = str(index[pred[0]])
result

In [ ]:
```

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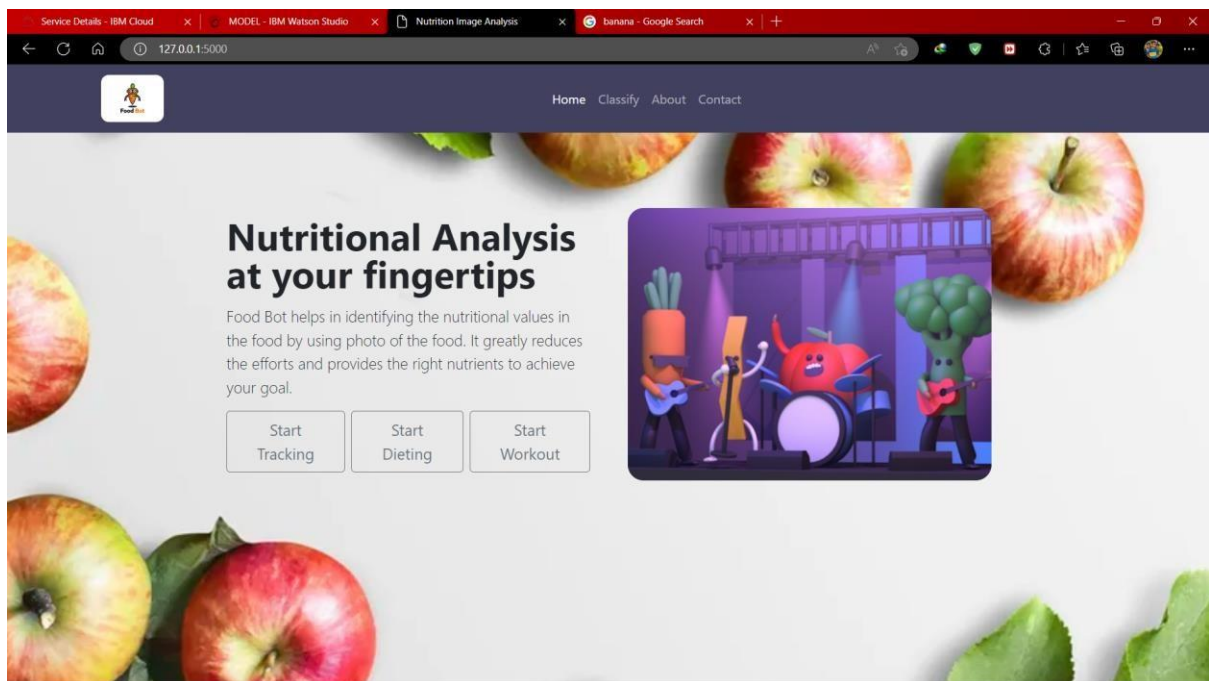
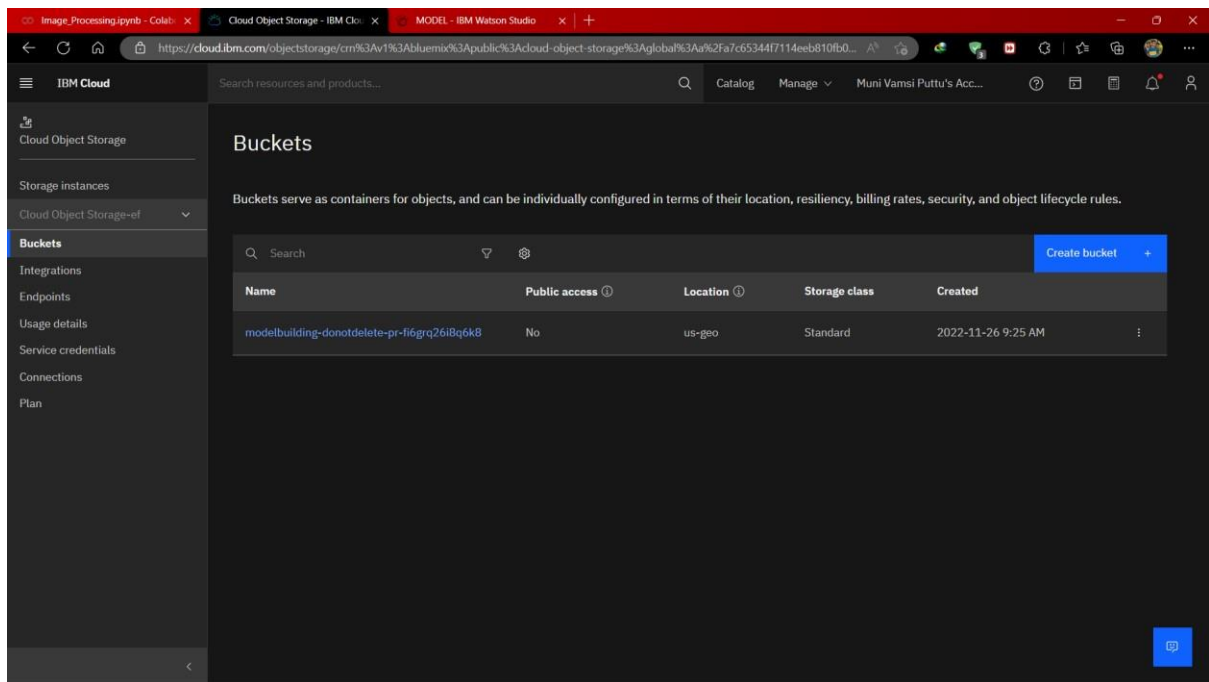
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Name	Group	Location	Product	Status	Tags
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Watson Studio-8x	Default	Dallas	Watson Studio	Active	
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DietPlan

banana - Google Search

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Follow this Diet plan to lose weight

Early Morning

- One fruit of choice + 3-4 mixed seeds
- 10ml wheatgrass juice + 5 to 6 almonds and walnuts
- 10ml Spiruline or green leafy veggie juice + 1 fruit of your choice
- 10ml Amla juice + 3-4 wainuts and almonds mix

Breakfast

- Open panner sandwich with maso chutney
- 2 idlis with sambhar
- 1 bowl vegetable sprout poha with chutney
- 3-4 dal paddu with sambhar
- 2 medium dal paranthas + 1 bowl low-fat curd

Mid-Morning

- 4 walnuts and 2 dates
- Fruit of your choice
- 1 glass Whey protein shake with milk/assorted fruit platter
- 1 fruit of your choice + 1 bowl of Assorted nuts
- 2 tbsp of trail mix
- Amaranth seeds chikki
- 3-4 dry fruits

Pre-Lunch

- 1 plate of preferred salad with vinegar dressing
- 1 bowl minestrone soup with more veggies and less of pasta
- 1 bowl sprout salad of choice
- 1 bowl mixed veggies chunky soup
- 1 bowl sprout salad
- 1 bowl grilled chicken or fish salad

Lunch

- 2 multigrain roti
- 1 Katori red or brown rice + 1 Dal + Veg
- 2 multigrain roti + 1 bowl vegetable subji
- non-veg subji + 1 bowl boiled pulse chaat
- 2 multigrain roti + 1 bowl veg or non-veg (seafood, fish, chicken) subji of choice + 1 bowl of thick da
- 1 bowl millet and dal khichdi + 1 bowl mixed vegetable kadhai

Snack

- 1 glass whey protein drink + Hummus with veggies
- 2 multigrain flour khakras
- 1 fruit of your choice + 1 cup green tea
- Til or peanut chikki with 1 cup spirulina and mixed veggie juice.
- 1 cup spiced boiled corn or 1 corn on the cob + 1 cup coffee, tea or green tea

