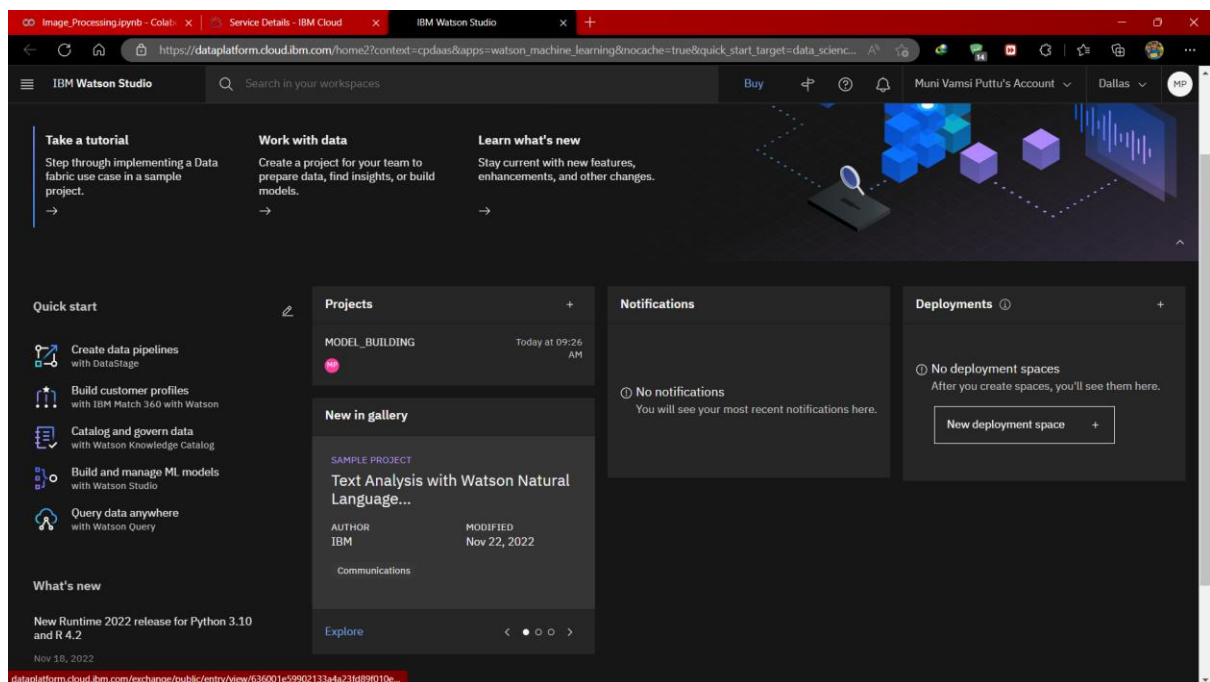
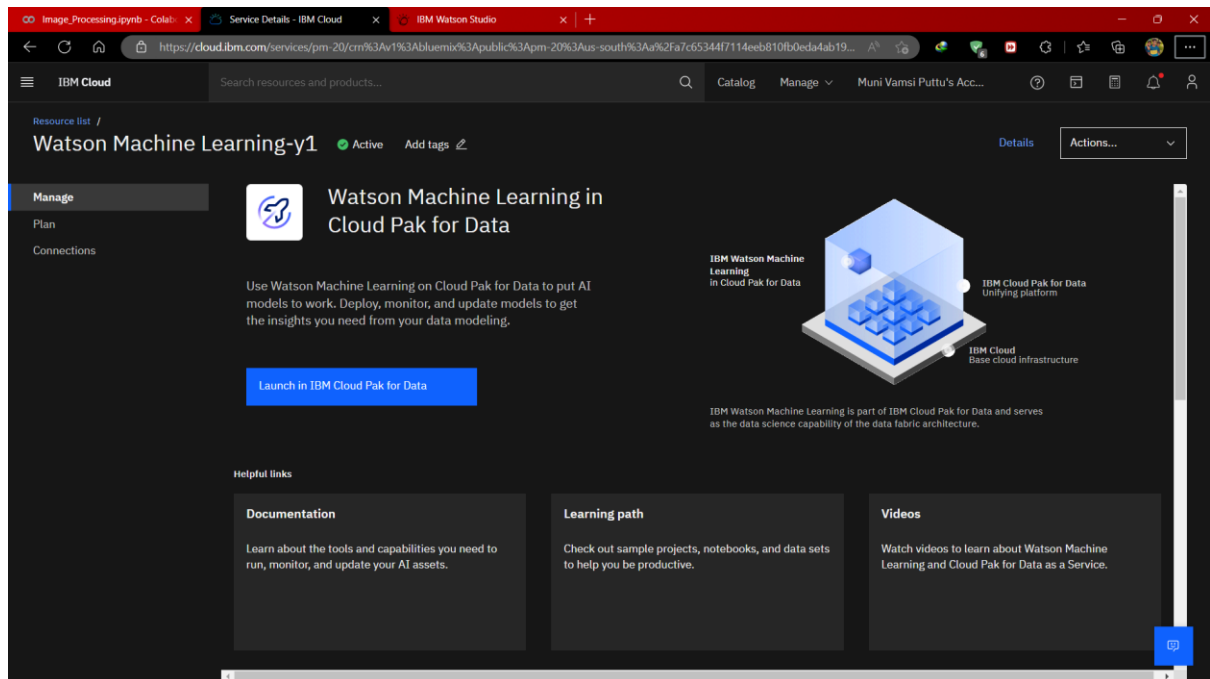


Train Model On IBM

TEAM ID: PNT2022TMID17050

PROJECT NAME: AI-powered Nutrition Analyzer for Fitness Enthusiasts



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https://dataplatform.cloud.ibm.com/projects/0f02bcd2-d98e-4a92-9f36-82b9428e6281/assets/context-cpdaas

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- Data assets 1
- Notebooks 1

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

Items per page: 20 1-2 of 2 items 1 of 1 pages

Data in this project

Drop data files here or browse for files to upload

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Run Format Code

```
In [169]: pwd
Out[169]: '/home/wsuser/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>=0.21.0 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 tensorflow) (0.4.4)
Requirement already satisfied: setuptools>=41.0.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from 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 tensorflow) (0.6.1)
Requirement already satisfied: werkzeug>=0.11.15 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (2.0.2)
Requirement already satisfied: markdown>=2.6.8 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from 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='lNv163hXxrLS9SV936QwVCjca_Hov8v-fSIwEF101vh',
          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/ksuser/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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Projects / MODEL_BUILDING / MODEL

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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/ksuser/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=tr(index[pred[0]])
        result

In f. 1:
```

Check this out - Untitled0.ipynb x Image_Processing.ipynb - Colab x Identity & Access Management x MODEL - IBM Watson Studio x git bash - Invalid requirement - x

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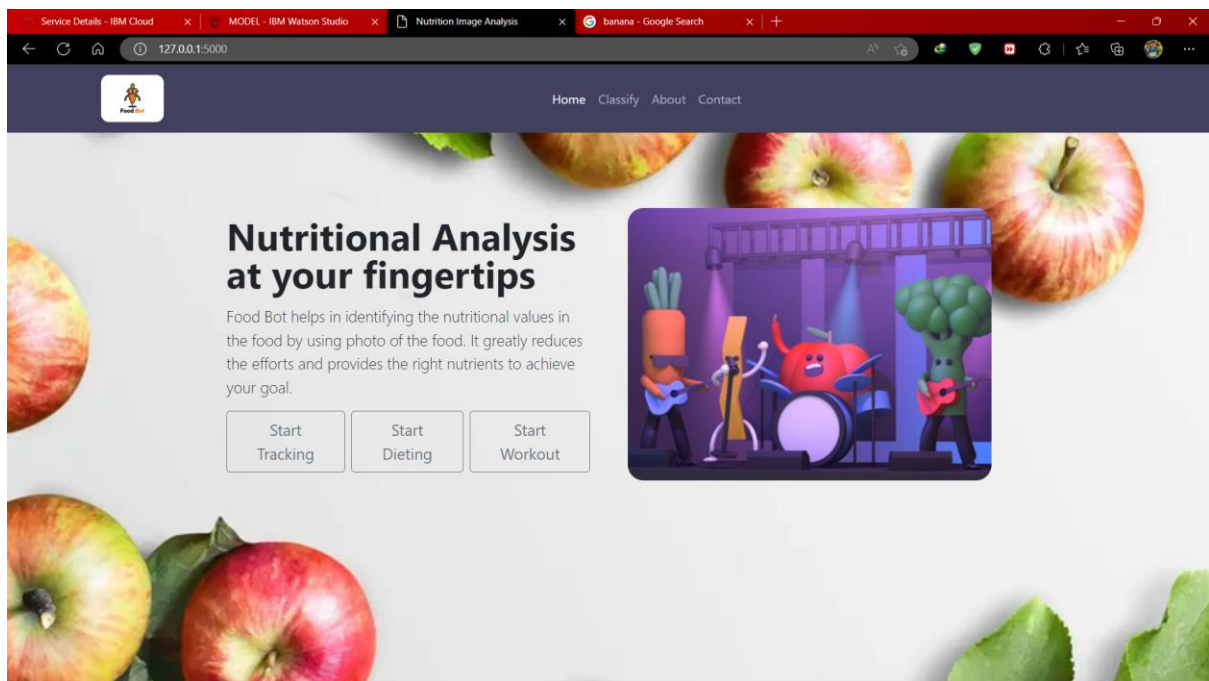
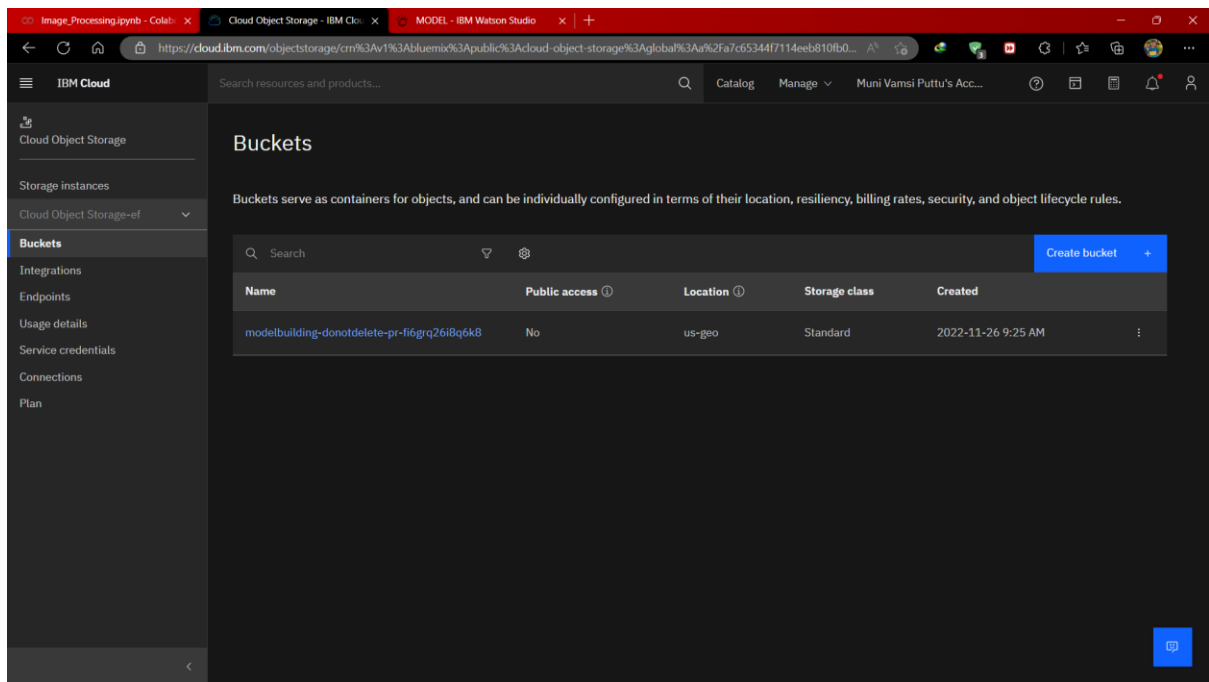
Launch Cloud Pak for Data

Group: Filter... Location: Filter... Search

Name	Group	Location	Product	Status	Tags
Cloud Object Storage-ef	Default	Global	Cloud Object Storage	Active	
Watson Studio-8x	Default	Dallas	Watson Studio	Active	
Watson Machine Learning-y1	Default	Dallas	Watson Machine Learning	Active	

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127.0.0.1:5000/diet

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 meat 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/half 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

Dinner

- 1 bowl chicken gravy + 2 multigrain rotis + salad + 1 bowl low-fat curd
- 1 veg paratha + Raita
- 1 bowl fruit and veggie mixed salad of choice + 2 bran rotis (wheat roti or oat bran)

Post-dinner

- 4-5 pieces of nuts/1 glass warm low-fat milkB
- 1 glass of whey protein shake if missed during snack
- 1 glass of whey protein shake

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127.0.0.1:5000/diet

Choose

- Try fruits beyond apples and bananas such as mango, pineapple or kiwi fruit

herb such as fenugreek

- You can also sauté (panfry) vegetables in a non-stick pan with a small amount of cooking spray

and fat-free yogurt without added sugars

- These come in a variety of flavors and can be a great dessert substitute.

Meats

- If your favorite recipe calls for frying fish or breaded chicken, try healthier variations by baking or grilling
- Maybe even try dry beans in place of meats.

Comfort Foods

- Healthy eating is all about balance.
- You can enjoy your favorite foods, even if they are high in calories, fat or added sugars

Healthy Ways to Gain Weight If You Are Underweight

Eat Nutrient- Rich Food

- Food is the most powerful factor that can make or break your health
- If you are trying to gain weight, the first thing you need to be conscious of is your choice of food.

Increase Protein Intake

- Protein is essential for gaining muscle mass and is a quintessential element for promoting healthy weight gain.
- Include natural sources of protein like egg, milk, soy, peas, lean chicken, fish, etc in your diet.

Get Adequate Sleep

- Whether you want to lose weight or gain it, getting an adequate amount of sleep is a key factor in maintaining a healthy body.
- While you sleep, your body's mechanism starts its healing and building process

Eat More Calories

- Eating surplus calories will help you gain weight.
- But be wise while consuming your calories. Steer clear of junk food and empty calories and choose more healthy foods like nuts, seeds, whole grains, and good fats

Eat Frequent Meals

- Make a habit of eating small but frequent meals.
- These meals should be nutrient-dense to fill your body's daily requirements to carry out daily bodily functions and form muscle mass.

Exercise

- Engage in physical activities that will help you build muscle mass.
- Strength training is one of the best exercises to promote healthy weight gain

