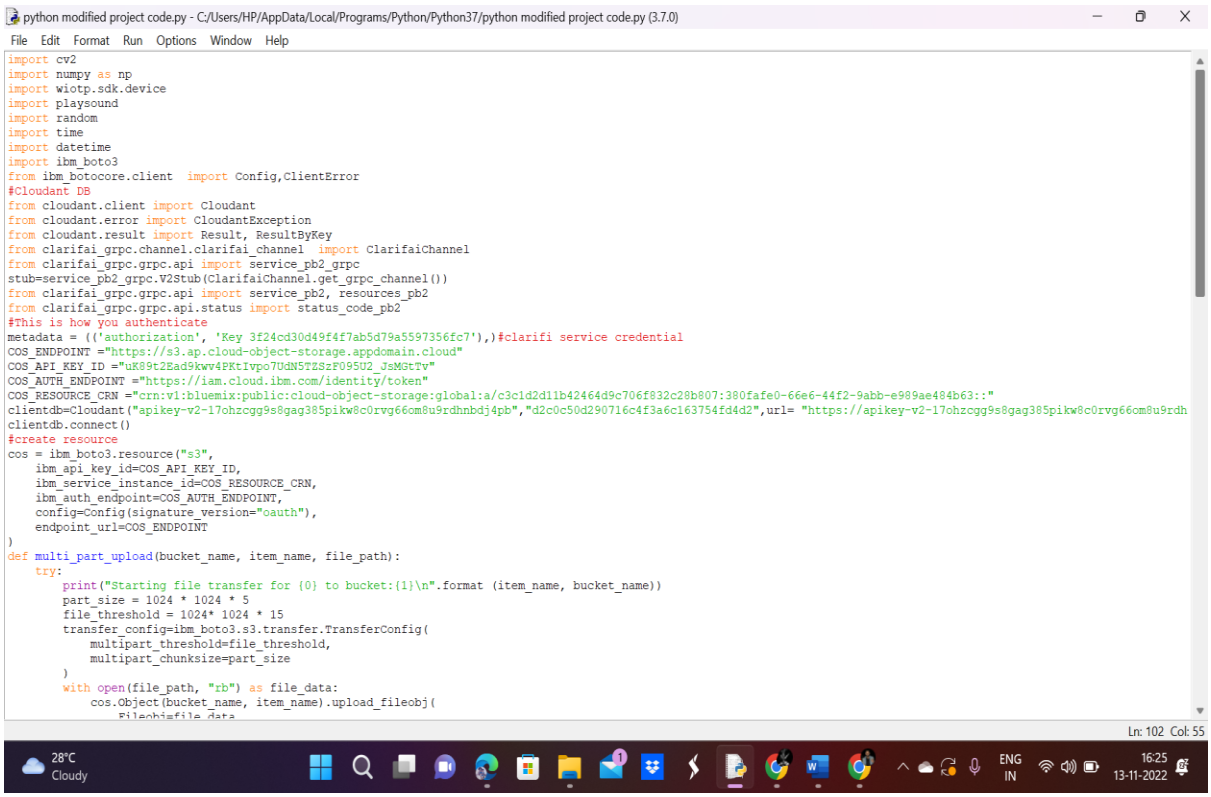
Sprint-4

TEAM ID	PNT2022TMID34531
PROJECT NAME	**IoT Based Smart Crop Protection System for Agriculture**

Code in the Python IDLE:



```
python modified project code.py - C:/Users/HP/AppData/Local/Programs/Python/Python37/python modified project code.py (3.7.0)
File  Edit  Format  Run  Options  Window  Help
import cv2
import numpy as np
import wiotp.sdk.device
import playsound
import random
import time
import datetime
import ibm_boto3
from ibm_botocore.client  import Config,ClientError
#Cloudant DB
from cloudant.client import Cloudant
from cloudant.error import CloudantException
from cloudant.result import Result, ResultByKey
from clarifai_grpc.channel.clarifai_channel  import ClarifaiChannel
from clarifai_grpc.grpc.api import service_pb2_grpc
stub=service_pb2_grpc.V2Stub(ClarifaiChannel.get_grpc_channel())
from clarifai_grpc.grpc.api import service_pb2, resources_pb2
from clarifai_grpc.grpc.api.status import status_code_pb2
#This is how you authenticate
metadata = (('authorization', 'Key 3f24cd30d49f4f7ab5d79a5597356fc7'),)#clarifi service credential
COS_ENDPOINT ="https://s3.ap.cloud-object-storage.appdomain.cloud"
COS_API_KEY_ID ="uK89t2Bad9kwv4PKtIvpo7UdN5TZSzF095U2_JsMGtTv"
COS_AUTH_ENDPOINT ="https://iam.cloud.ibm.com/identity/token"
COS_RESOURCE_CRN ="crn:v1:bluemix:public:cloud-object-storage:global:a/c3c1d2d11b42464d9c706f832c28b807:380fafe0-66e6-44f2-9abb-e989ae484b63::"
clientdb=Cloudant("apikey-v2-17ohzcgg9s8gag385pikw8c0rvg66om8u9rdhnbdj4pb","d2c0c50d290716c4f3a6c163754fd4d2",url= "https://apikey-v2-17ohzcgg9s8gag385pikw8c0rvg66om8u9rdh
clientdb.connect()
#create resource
cos = ibm_boto3.resource("s3",
    ibm_api_key_id=COS_API_KEY_ID,
    ibm_service_instance_id=COS_RESOURCE_CRN,
    ibm_auth_endpoint=COS_AUTH_ENDPOINT,
    config=Config(signature_version="oauth"),
    endpoint_url=COS_ENDPOINT
)
def multi_part_upload(bucket_name, item_name, file_path):
    try:
        print("Starting file transfer for {0} to bucket:{1}\n".format (item_name, bucket_name))
        part_size = 1024 * 1024 * 5
        file_threshold = 1024* 1024 * 15
        transfer_config=ibm_boto3.s3.transfer.TransferConfig(
            multipart_threshold=file_threshold,
            multipart_chunksize=part_size
        )
        with open(file_path, "rb") as file_data:
            cos.Object(bucket_name, item_name).upload_fileobj(
                Fileobj=file_data
Ln: 102  Col: 55
28°C
Cloudy
ENG
IN
16:25
13-11-2022
```

python modified project code.py - C:/Users/HP/AppData/Local/Programs/Python/Python37/python modified project code.py (3.7.0)

File Edit Format Run Options Window Help

```
            multipart_threshold=file_threshold,
            multipart_chunksize=part_size
        )
        with open(file_path, "rb") as file_data:
            cos.Object(bucket_name, item_name).upload_fileobj(
                Fileobj=file_data,
                Config=transfer_config
            )
        print ("Transfer for {0} Complete!\n".format(item_name))
    except ClientError as be:
        print ("CLIENT ERROR: {0}\n".format(be))
    except Exception as e:
        print("Unable to complete multi-part upload: {0}".format(e))

def  myCommandCallback(cmd):
    print("Command received: %s" % cmd.data)
    command=cmd.data['command']
    print(command)
    if(command=='lighton'):
        print('lighton')
    elif(command=='lightoff'):
        print('lightoff')
    elif(command=='motoron'):
        print('motoron')
    elif(command=='motoroff'):
        print('motoroff')
myConfig = {
    "identity": {
        "orgId":"kc06ni",
        "typeId": "abcd",
        "deviceId": "123"
    },
    "auth": {
        "token":"12345678"
    }
}
client= wiotp.sdk.device.DeviceClient(config=myConfig, logHandlers=None)
client.connect()

database_name="sample1"
my_database = clientdb.create_database(database_name)
if my_database.exists():
   print(f"'{database_name}' successfully created.")
   cap=cv2.VideoCapture("garden.mp4")
if(cap.isOpened()==True):
    print('File opened')
```

Ln: 102 Col: 55

python modified project code.py - C:/Users/HP/AppData/Local/Programs/Python/Python37/python modified project code.py (3.7.0)

File Edit Format Run Options Window Help

```
}
client= wiotp.sdk.device.DeviceClient(config=myConfig, logHandlers=None)
client.connect()

database_name="sample1"
my_database = clientdb.create_database(database_name)
if my_database.exists():
   print(f"'{database_name}' successfully created.")
   cap=cv2.VideoCapture("garden.mp4")
if(cap.isOpened()==True):
    print('File opened')
else:
    print ('File not found')

while(cap.isOpened()):
    ret, frame = cap.read()
    gray =cv2.cvtColor(frame ,cv2.COLOR_BGR2GRAY)
    imS=cv2.resize(frame,(960,540))
    cv2.imwrite('ex.jpg',imS)
    with open("ex.jpg","rb") as f:
        file_bytes = f.read()
    request = service_pb2.PostModelOutputsRequest(
        model_id='aaa03c23b3724a16a56b629203edc62c',#"e2eb7c86020f842148cd36bb3a11086a"
        inputs=[resources_pb2.Input(data=resources_pb2.Data(image=resources_pb2.Image(base64=file_bytes))
        )])
    response = stub.PostModelOutputs(request ,metadata=metadata)
    if response.status.code != status_code_pb2.SUCCESS:
        raise Exception("Request failed,status code :" + str (response.status.code))
    detect=False
    for concept in response.outputs[0].data.concepts:
        if(concept.value>0.98):
            if(concept.name=="animal"):
                print("Alert! Alert! animal detected")
                playsound.playsound('alert.mp3')
                picname=datetime.datetime.now().strftime("%y-%m-%d-%H-%M")
                cv2.imrite(picname+'.jpg',frame)
                multi_part_upload('adalin' ,picname+'.jpg',picname+'.jpg')
                json_document={"link":COS_ENDPOINT+'/'+'adalin'+'/'+picname+'.jpg'}
                new_document = my_database.create_document(json_document)
                if new_document.exists():
                   print (f"Document successfully created.")
                time.sleep(5)
                detect =True
    moist=random.randint(0,100)
    temp=random.randint(0,100)
    humidity =random.randint(0,100)
```

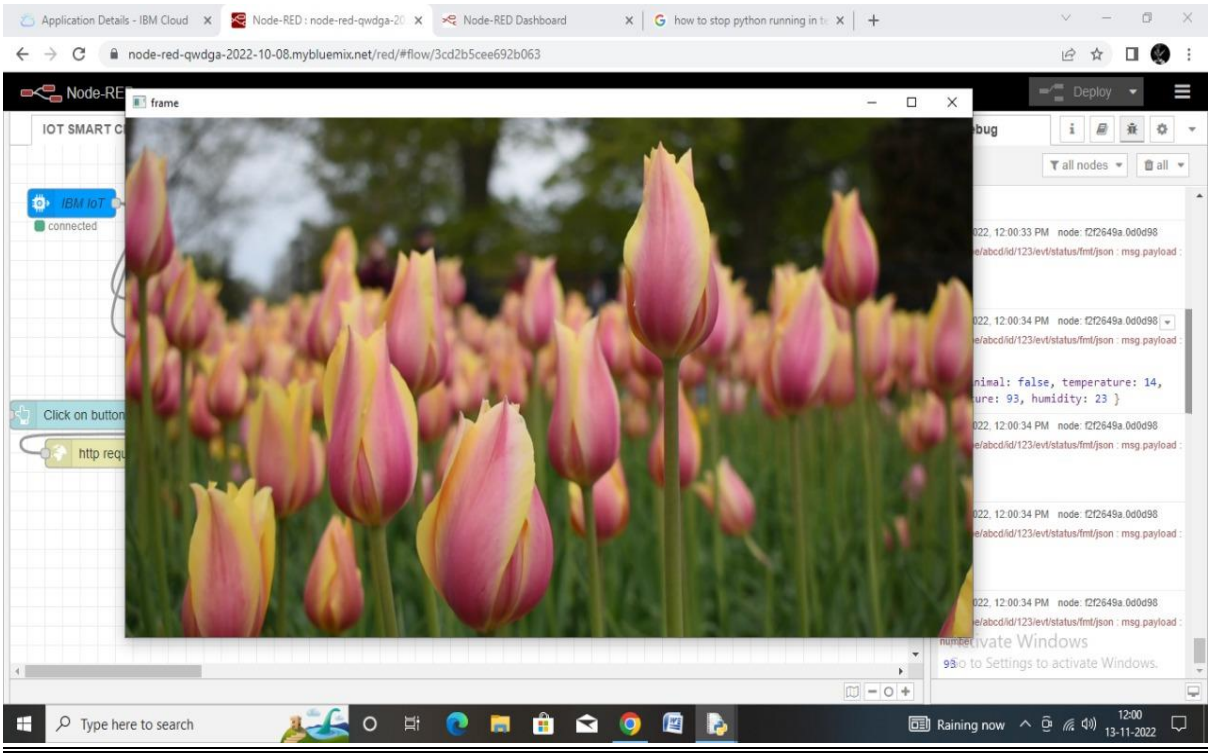
Ln: 122 Col: 50

```
while(cap.isOpened()):
    ret, frame = cap.read()
    gray =cv2.cvtColor(frame ,cv2.COLOR_BGR2GRAY)
    imS=cv2.resize(frame,(960,540))
    cv2.imwrite('ex.jpg',imS)
    with open("ex.jpg","rb") as f:
        file_bytes = f.read()
    request = service_pb2.PostModelOutputsRequest(
        model_id='aaa03c23b3724a16a56b629203edc62c',#"e2eb7c86020f842148cd36bb3a11086a"
        inputs=[resources_pb2.Input(data=resources_pb2.Data(image=resources_pb2.Image(base64=file_bytes))
        )])
    response = stub.PostModelOutputs(request ,metadata=metadata)
    if response.status.code != status_code_pb2.SUCCESS:
        raise Exception("Request failed,status code :" + str (response.status.code))
    detect=False
    for concept in response.outputs[0].data.concepts:
        if(concept.value>0.98):
            if(concept.name=="animal"):
                print("Alert! Alert! animal detected")
                playsound.playsound('alert.mp3')
                picname=datetime.datetime.now().strftime("%y-%m-%d-%H-%M")
                cv2.imrite(picname+'.jpg',frame)
                multi_part_upload('adalin' ,picname+'.jpg',picname+'.jpg')
                json_document={"link":COS_ENDPOINT+'/'+'adalin'+'/'+picname+'.jpg'}
                new_document = my_database.create_document(json_document)
                if new_document.exists():
                   print (f"Document successfully created.")
                time.sleep(5)
                detect =True
    moist=random.randint(0,100)
    temp=random.randint(0,100)
    humidity =random.randint(0,100)
    myData={'Animal': detect,'temperature': temp,'moisture':moist,'humidity':humidity}
    print(myData)
    if(humidity!=None):
        client.publishEvent(eventId="status",msgFormat="json", data=myData, qos=0, onPublish=None)
        print("Publish Ok..")
    client.commandCallback = myCommandCallback
    cv2.imshow('frame',imS)
    if cv2.waitKey(1) & 0xFF == ord('q'):
        break
client.disconnect()
cap.release()
cv2.destroyAllWindows()
```

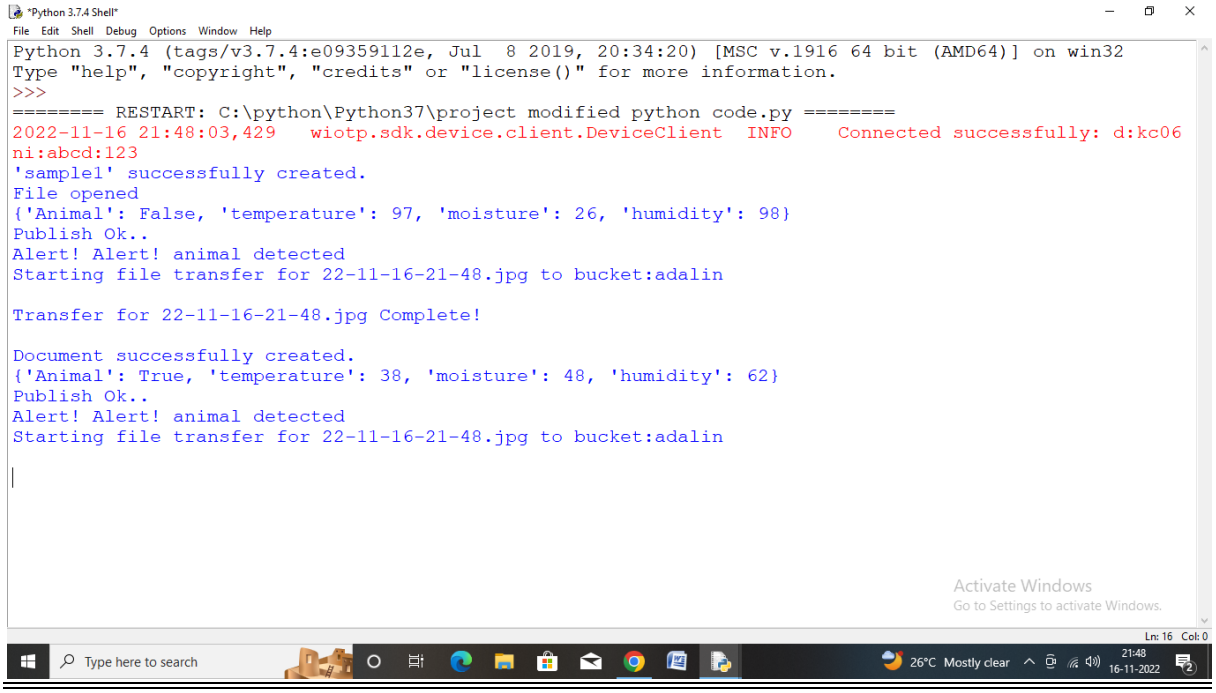
Output from python:

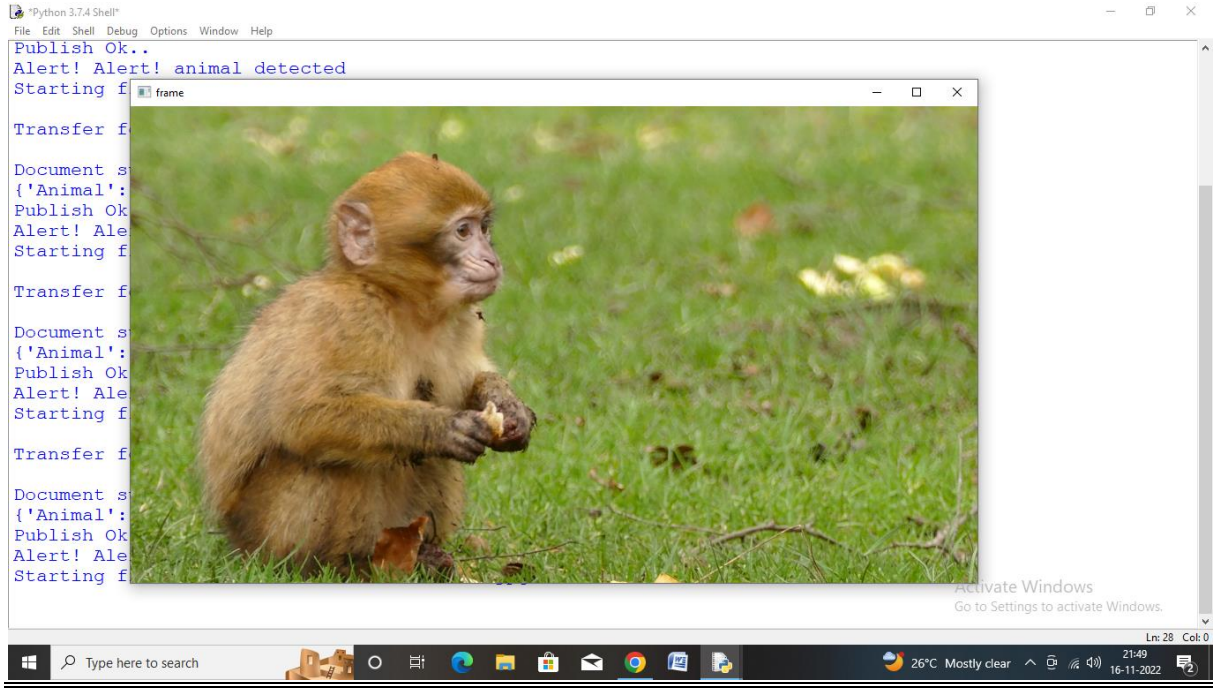
- When Animal is not detected:

```
Python 3.7.4 (tags/v3.7.4:e09359112e, Jul  8 2019, 20:34:20) [MSC v.1916 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>>
======== RESTART: C:\python\Python37\python modified project code.py ========
2022-11-13 12:00:04,390   wiotp.sdk.device.client.DeviceClient  INFO    Connected successfully: d:kc06
ni:abcd:123
'sample1' successfully created.
File opened
{'Animal': False, 'temperature': 29, 'moisture': 63, 'humidity': 21}
Publish Ok..
{'Animal': False, 'temperature': 80, 'moisture': 24, 'humidity': 9}
Publish Ok..
{'Animal': False, 'temperature': 45, 'moisture': 100, 'humidity': 13}
Publish Ok..
{'Animal': False, 'temperature': 3, 'moisture': 97, 'humidity': 38}
Publish Ok..
{'Animal': False, 'temperature': 5, 'moisture': 80, 'humidity': 4}
Publish Ok..
{'Animal': False, 'temperature': 75, 'moisture': 7, 'humidity': 38}
Publish Ok..
{'Animal': False, 'temperature': 48, 'moisture': 56, 'humidity': 4}
Publish Ok..
{'Animal': False, 'temperature': 86, 'moisture': 15, 'humidity': 46}
Publish Ok..
{'Animal': False, 'temperature': 10, 'moisture': 26, 'humidity': 51}
Publish Ok..
{'Animal': False, 'temperature': 3, 'moisture': 69, 'humidity': 27}
Publish Ok..
{'Animal': False, 'temperature': 19, 'moisture': 46, 'humidity': 85}
```

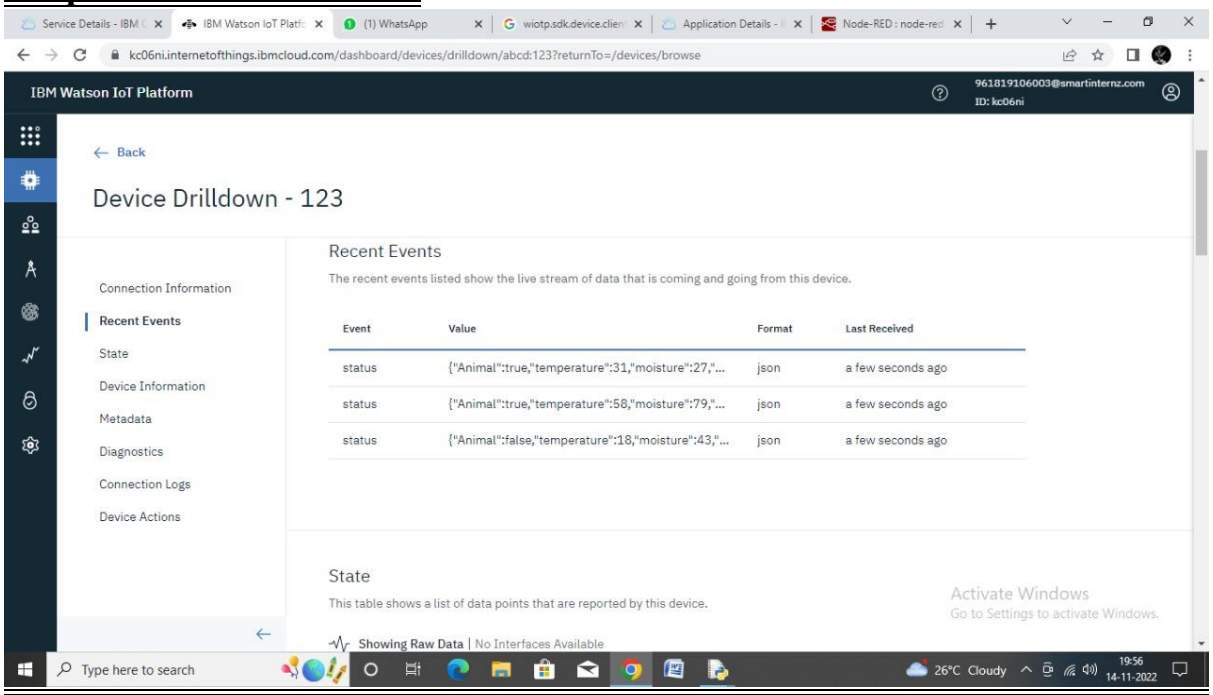


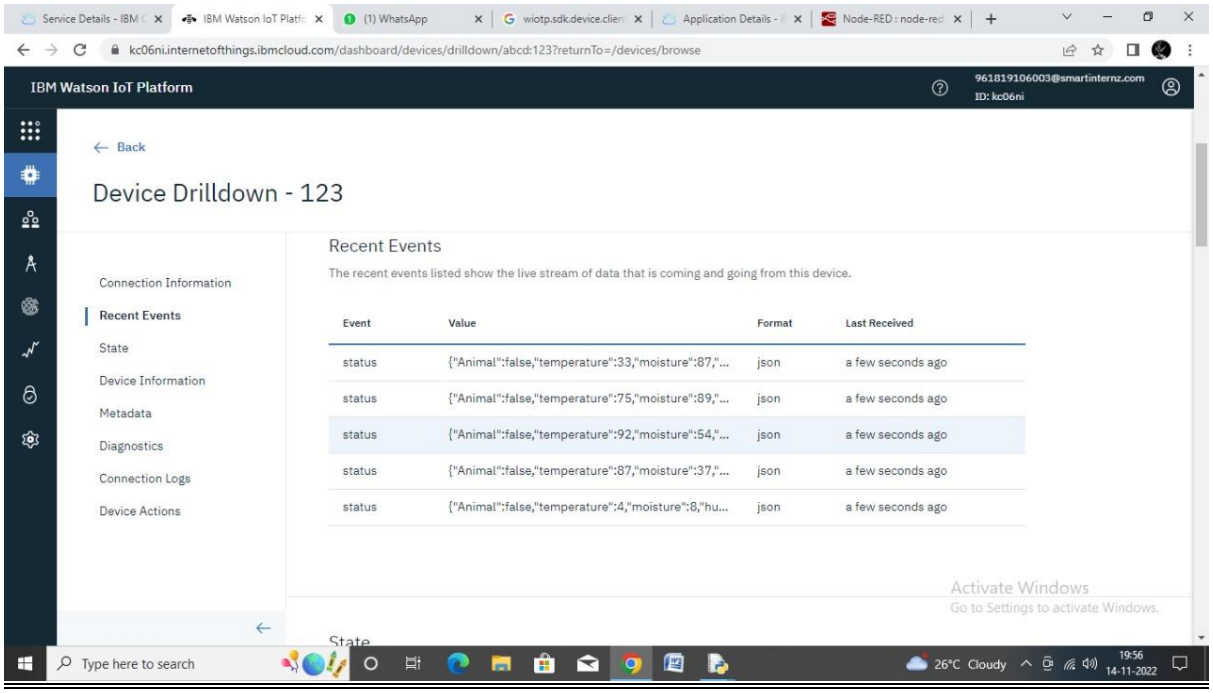
- When Animal is Detected:



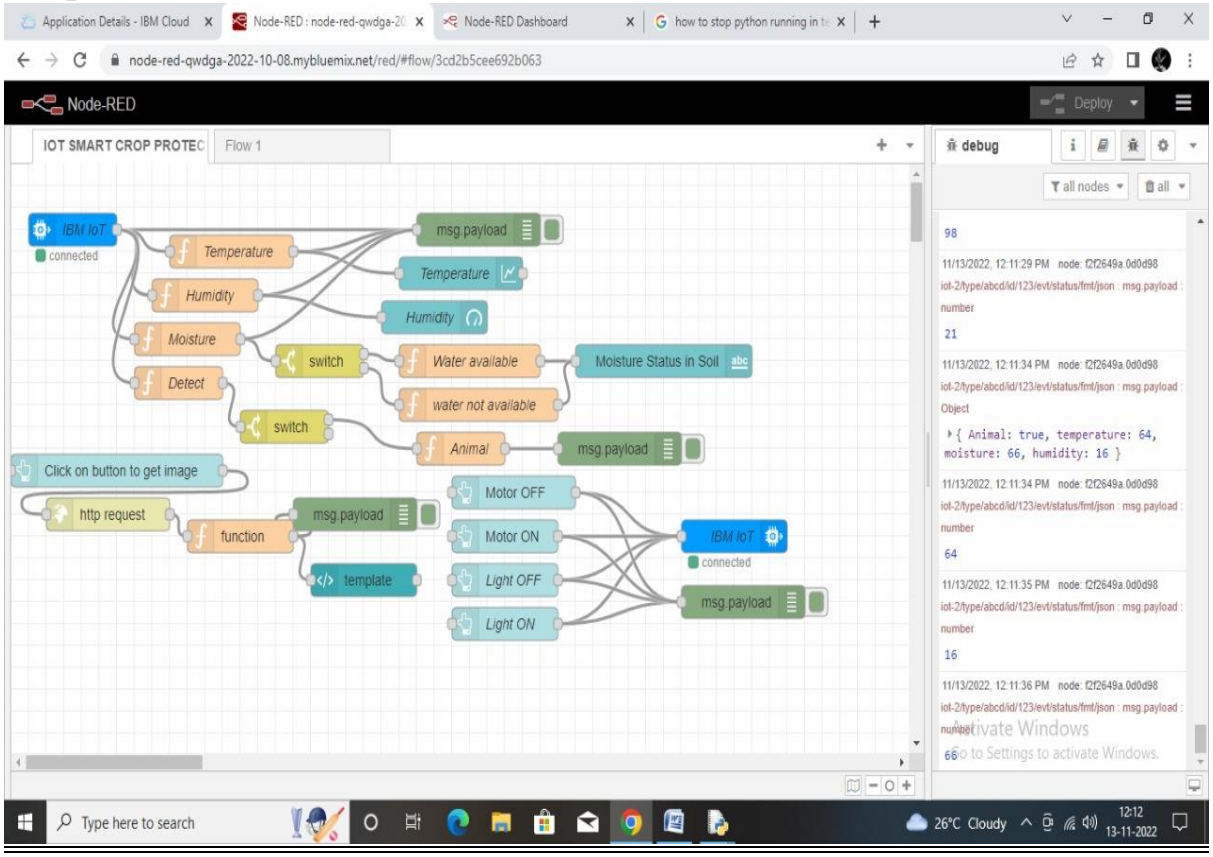


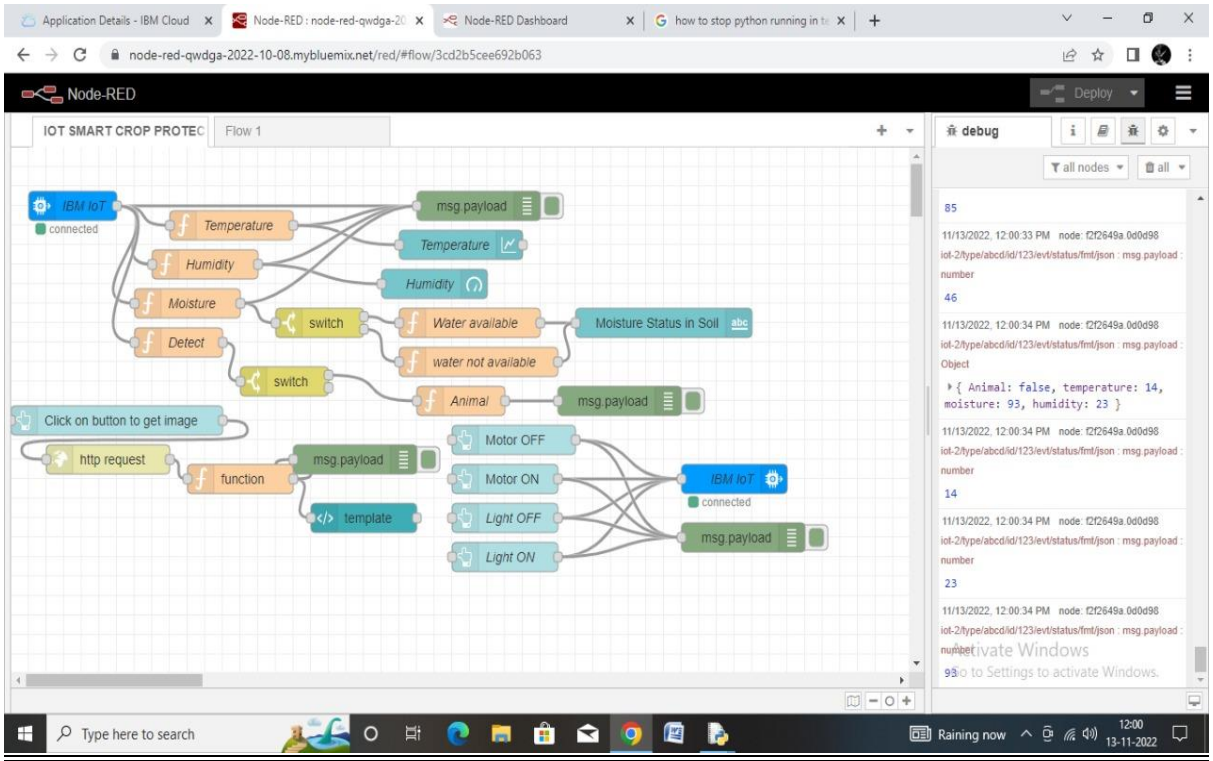
Output from IoT Watson:



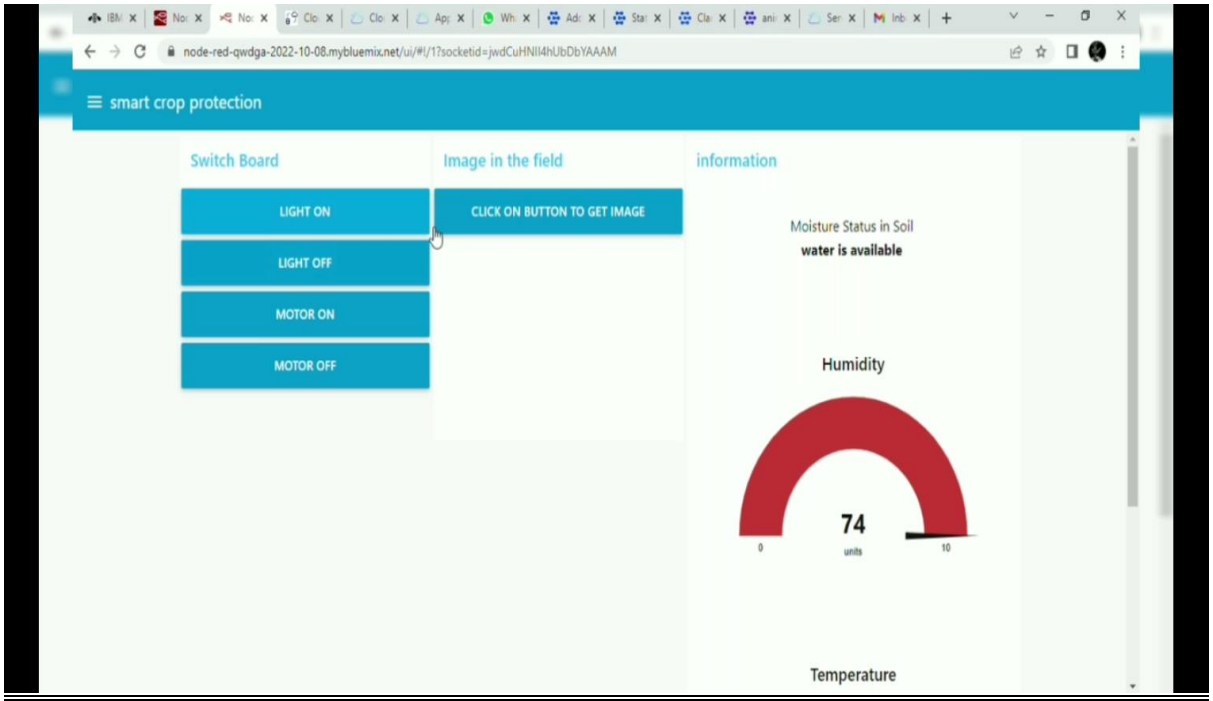


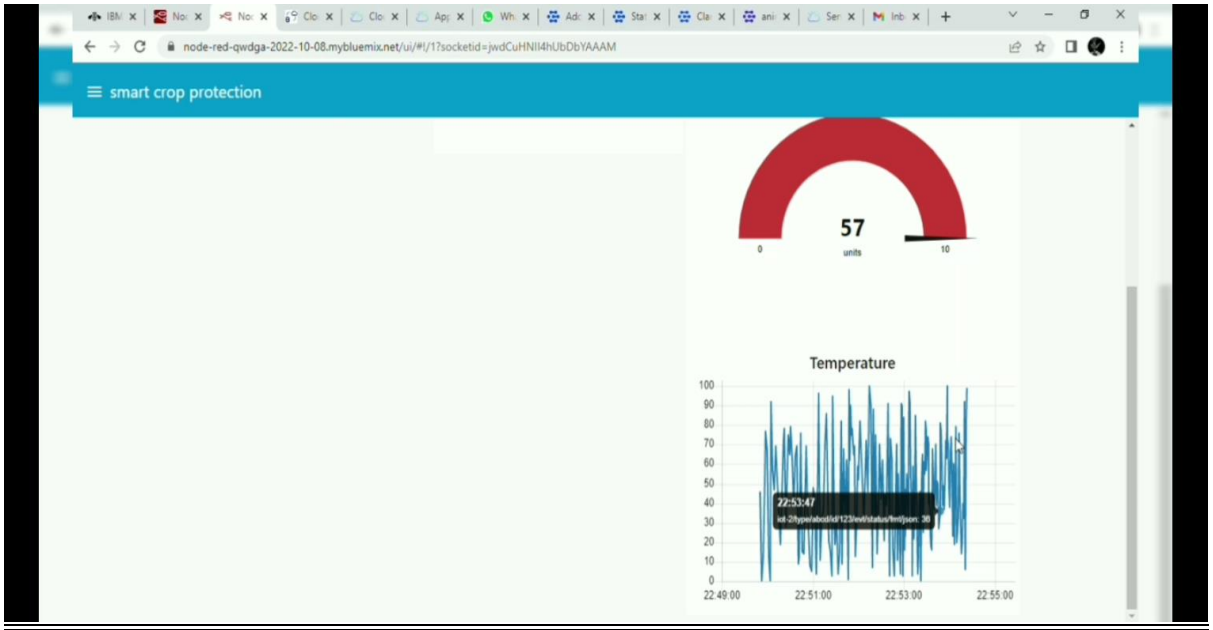
Output from Node-RED:





Output from Node-RED Dashboard:



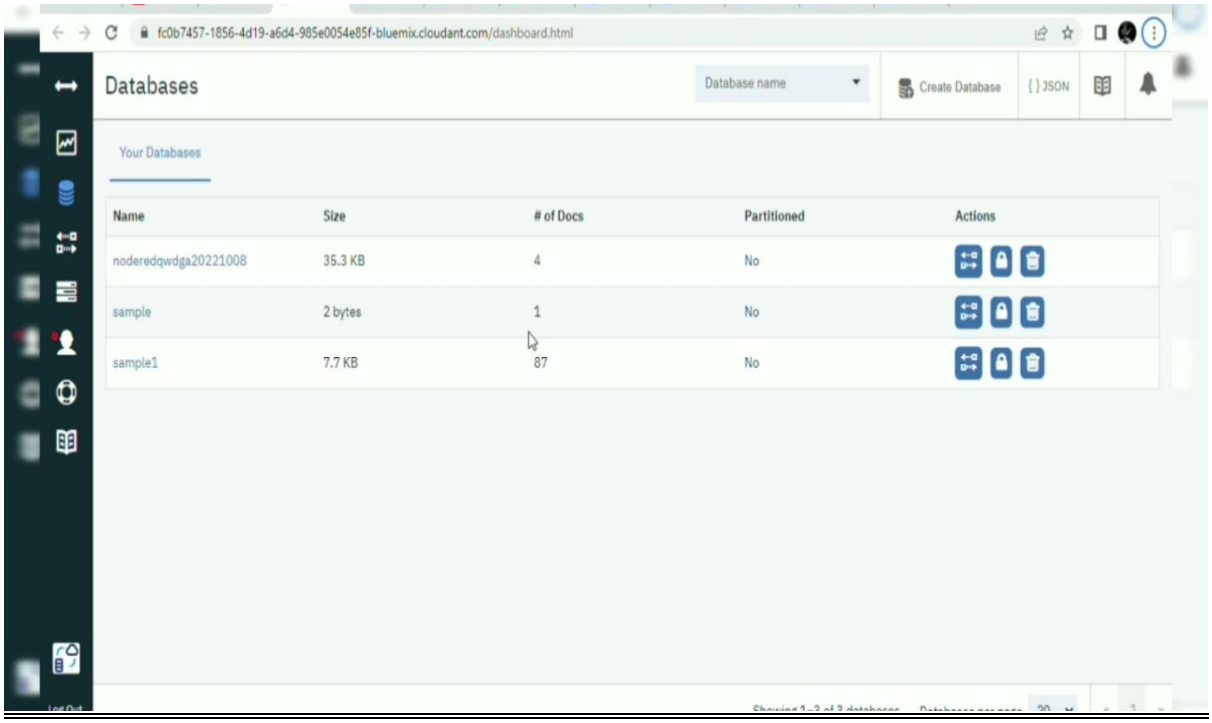


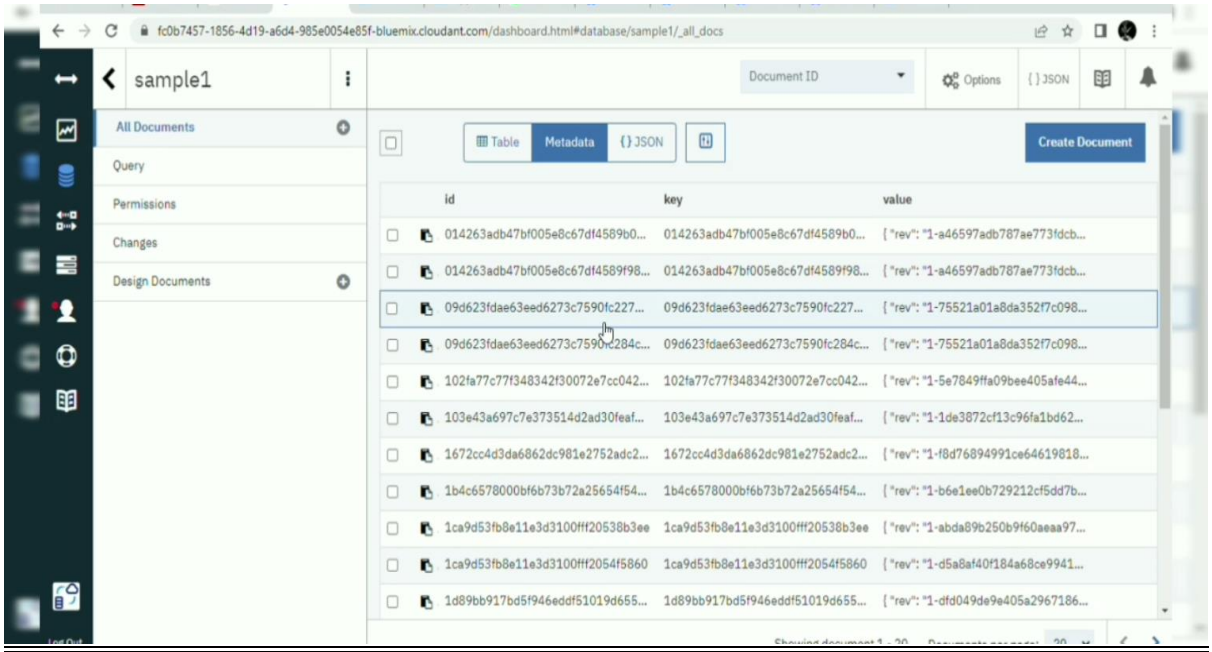
Output for Commands from Node-RED to Python:

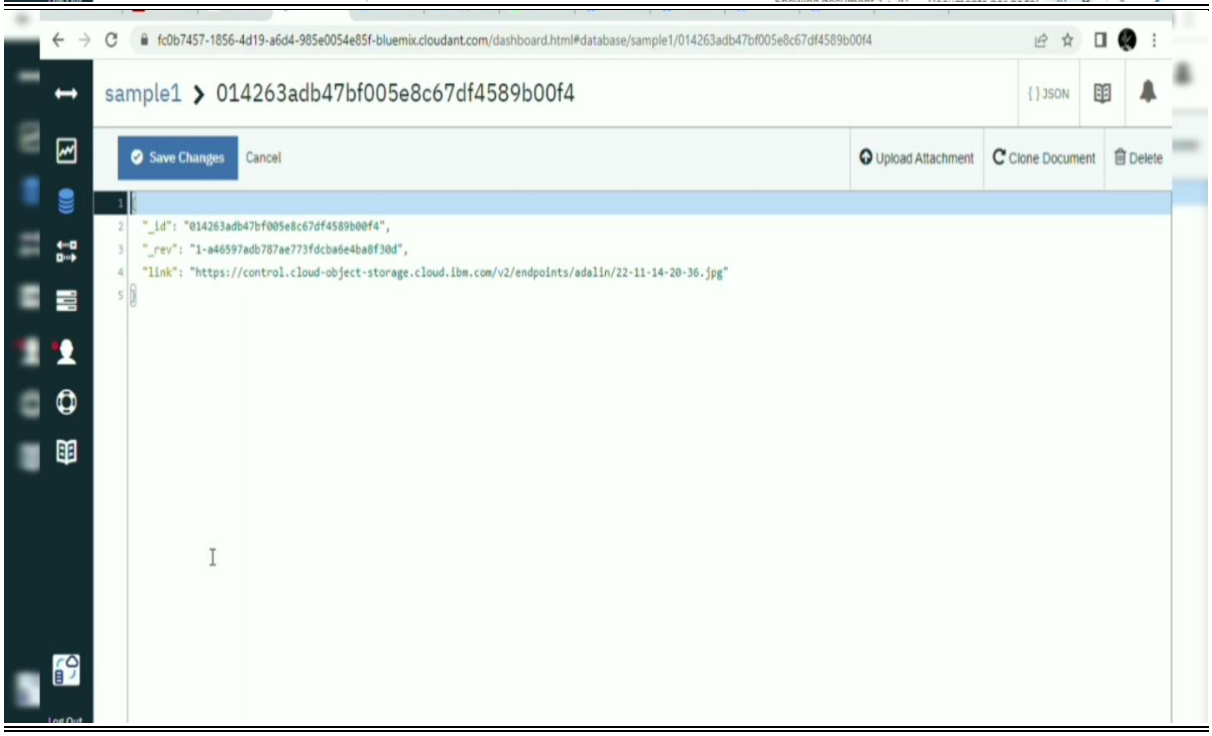
```
Command received: {'command': 'lightoff'}
lightoff
lightoff
{'Animal': True, 'temperature': 45, 'moisture': 48, 'humidity': 30}
Publish Ok..
Alert! Alert! animal detected
Starting file transfer for 22-11-15-22-27.jpg to bucket:adalin

Transfer for 22-11-15-22-27.jpg Complete!

Document successfully created.
{'Animal': True, 'temperature': 5, 'moisture': 48, 'humidity': 38}
Publish Ok..
Alert! Alert! animal detected
Starting file transfer for 22-11-15-22-28.jpg to bucket:adalin

Transfer for 22-11-15-22-28.jpg Complete!

Document successfully created.
Command received: {'command': 'motor on'}
motor on
Command received: {'command': 'motor on'}
motor on
{'Animal': True, 'temperature': 44, 'moisture': 52, 'humidity': 1}
Publish Ok..
Alert! Alert! animal detected
Starting file transfer for 22-11-15-22-28.jpg to bucket:adalin
```

```
Transfer for 22-11-15-22-27.jpg Complete!

Document successfully created.
{'Animal': True, 'temperature': 65, 'moisture': 74, 'humidity': 67}
Publish Ok..
Alert! Alert! animal detected
Starting file transfer for 22-11-15-22-27.jpg to bucket:adalin

Command received: {'command': 'lighton'}
lighton
lighton
Transfer for 22-11-15-22-27.jpg Complete!

Command received: {'command': 'lighton'}
lighton
lighton
Command received: {'command': 'lightoff'}Document successfully created.

lightoff
lightoff
Command received: {'command': 'lightoff'}
lightoff
lightoff
{'Animal': True, 'temperature': 45, 'moisture': 48, 'humidity': 30}
Publish Ok..
Alert! Alert! animal detected
Starting file transfer for 22-11-15-22-27.jpg to bucket:adalin
```

Output from Cloudant Database:




fc0b7457-1856-4d19-a6d4-985e0054e85f-bluemix.cloudant.com/dashboard.html#database/sample1/_all_docs
sample1
Document ID
Options
{ } JSON
All Documents
Query
Permissions
Changes
Design Documents
Table
Metadata
{ } JSON
Create Document
id
key
value
014263adb47bf005e8c67df4589b0...
014263adb47bf005e8c67df4589b0...
{ "rev": "1-a46597adb787ae773fdcb...
014263adb47bf005e8c67df4589f98...
014263adb47bf005e8c67df4589f98...
{ "rev": "1-a46597adb787ae773fdcb...
09d623fdae63eed6273c7590fc227...
09d623fdae63eed6273c7590fc227...
{ "rev": "1-75521a01a8da352f7c098...
09d623fdae63eed6273c7590fc284c...
09d623fdae63eed6273c7590fc284c...
{ "rev": "1-75521a01a8da352f7c098...
102fa77c77f348342f30072e7cc042...
102fa77c77f348342f30072e7cc042...
{ "rev": "1-5e7849ffa09bee405afe44...
103e43a697c7e373514d2ad30feaf...
103e43a697c7e373514d2ad30feaf...
{ "rev": "1-1de3872cf13c96fa1bd62...
1672cc4d3da6862dc981e2752adc2...
1672cc4d3da6862dc981e2752adc2...
{ "rev": "1-f8d76894991ce64619818...
1b4c6578000bf6b73b72a25654f54...
1b4c6578000bf6b73b72a25654f54...
{ "rev": "1-b6e1ee0b729212cf5dd7b...
1ca9d53fb8e11e3d3100fff20538b3ee
1ca9d53fb8e11e3d3100fff20538b3ee
{ "rev": "1-abda89b250b9f60aeaa97...
1ca9d53fb8e11e3d3100fff2054f5860
1ca9d53fb8e11e3d3100fff2054f5860
{ "rev": "1-d5a8af40f184a68ce9941...
1d89bb917bd5f946eddf51019d655...
1d89bb917bd5f946eddf51019d655...
{ "rev": "1-dfd049de9e405a2967186...


fc0b7457-1856-4d19-a6d4-985e0054e85f-bluemix.cloudant.com/dashboard.html#database/sample1/014263adb47bf005e8c67df4589b00f4
sample1 › 014263adb47bf005e8c67df4589b00f4
{ } JSON
Save Changes
Cancel
Upload Attachment
Clone Document
Delete
{
"_id": "014263adb47bf005e8c67df4589b00f4",
"_rev": "1-a46597adb787ae773fdcba6e4ba8f30d",
"link": "https://control.cloud-object-storage.cloud.ibm.com/v2/endpoints/adalin/22-11-14-20-36.jpg"
}

Output from Cloud Object Storage: