SPRINT 2

IOT BASED SMART CROP POTECTION SYSTEM FOR AGRICULTURE

PYTHON CODE:

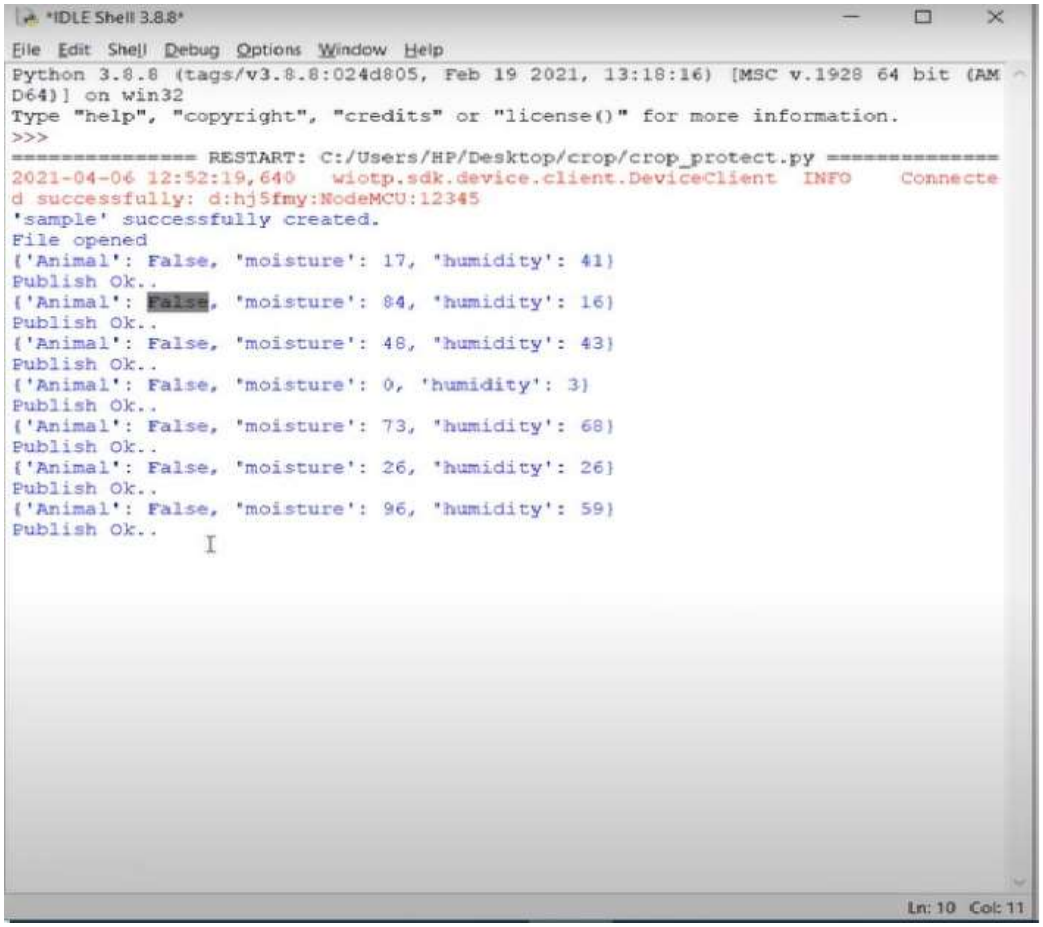
```
import cv2
import numpy as np
import wiot.sdk.device
import playsound
import random
import time
import datetime
import ibm_boto3
from ibm_botocore.client import Config, ClientError

#CloudantDB
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, resource_pb2
from clarifai_grpc.grpc.api.status import status_code_pb2

#This is how you authenticate
metadata = (('authorization', 'key 5797d941-433e-436a-a480-680d9080a990'),)
COS_ENDPOINT = "https://s3.tok.ap.cloud-object-storage.appdomain.cloud"
COS_API_KEY_ID = "v9n8Zn4r5VpcMVz_HyRY0DrS13jSzph2IEFioVj4-vmT"
COS_AUTH_ENDPOINT = "https://iam.cloud.ibm.com/identity/token"
COS_RESOURCE_CRN = "crn:v1:bluemix:public:cloud-object-
storage:global:a/3f060ee770d94e20a88f49f3da641d6d:f301cab2-2e94-48a1-a8a0-
5b4968527c54::"
clientdb = cloudant("apikey-_pIeLXPoaPpnOZ7SMoVKd6tZdsjf54X9LwkFEWB1a0T6",
"0165dca6-1176-4aa5-b0fe-81473e50e35d", url="https://47643860-3553-4211-ba2a-
d8e26dd17c08-bluemix.cloudantnosqldb.appdomain.cloud")
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))
        #set 5 MB chunks
        part_size = 1024 * 1024 * 5
        #set threadhold to 15 MB
        file_threshold = 1024 * 1024 * 15
        #set the transfer threshold and chunk size
        transfer_config = ibm_boto3.s3.transfer.TransferConfig(
            multipart_threshold=file_threshold,
            multipart_chunksize=part_size
            )
        #the upload_fileobj method will automatically execute a multi-part upload
        #in 5 MB chunks 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(commamd=="lighton"):
        print('lighton')
    elif(command=="lightoff"):
        print('lightoff')
    elif(command=="motoron"):
        print('motoron')
    elif(command=="motoroff"):
        print('motoroff')
myConfig = {
    "identity": {
        "orgId": "chytun",
        "typeId": "NodeMCU",
        "deviceId": "12345"
        },
    "auth": {
        "token": "12345678"
        }
    }
client = wiot.sdk.device.DeviceClient(config=myConfig, logHandlers=None)
client.connect()

database_name = "sample"
```

```
my_database = clientdb.create_database(database_name)
if my_dtabase.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 = cv3.cvtColor(frame, cv2.COLOR_BGR@GRAY)
   imS= cv2.resize(frame, (960,540))
   cv2.inwrite('ex.jpg',imS)
   with open("ex.jpg", "rb") as f:
      file_bytes = f.read()
   #This is the model ID of a publicly available General model. You may use any other public
or custom model ID.
   request = service_pb2.PostModeloutputsRequest(
      model_id='82eaf1c767a74869964531e4d9de5237',

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:
      #print('%12s: %.f' % (concept.name, concept.value))
      if(concept.value>0.98):
         #print(concept.name)
         if(concept.name=="animal"):
            print("Alert! Alert! animal detected")
            playsound.playsound('alert.mp3')
            picname=datetime.datetime.now().strftime("%y-%m-%d-%H-%M")
            cv2.inwrite(picname+'.jpg',frame)
            multi_part_upload('Umamaheswari', picname+'.jpg', picname+'.jpg')

json_document={"link":COS_ENDPOINT+'/'+'Umamaheswari'+'/'+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)
   humidity=random.randint(0,100)
   myData={'Animal':detect,'moisture':moist,'humidity':humidity}
   print(myData)
   if(humidity!=None):
```

```
        client.publishEvent(eventId="status",msgFormat="json", daya=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:



Text to speech:

```
rom ibm_watson
import
TextToSpeechV
1
                    from ibm_cloud_sdk_core.authenticators import IAMAuthenticator
                    import playsound

                    authenticator =
                    IAMAuthenticator('v9n8Zn4r5VpcMVz_HyRY0DrS13jSzph2IEFioV
                    j4-vmT')
                    text_to_speech = TextToSpeechV1(
                       authenticator=authenticator
                       )

                    text_to_speech.set_service_url('https://api.eu-gb.text-to-
                    speech.watson.cloud.ibm')

                    with open('alert.mp3', 'wb') as audio_file:
                       audio_file.write(
                          text_to_speech.synthesize(
                             'Alert! Alert! Animal Detected.',
                             voice='en-US_ALLisonV3Voice',
                             accept='audio/mp3'
                             ).get_result().content)
                    playsound.playsound('alert.mp3')
```