

## **FINAL PYTHON CODE**

TEAM ID	PNT2022TMID34531
PROJECT NAME	<b>IoT Based Smart Crop Protection System for Agriculture</b>

### **Python Code:**

```
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"
```

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COS_API_KEY_ID
="uK89t2Ead9kwv4PKtIvpo7UdN5TZSzF095U2_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-
17ohzcg9s8gag385pikw8c0rv66om8u9rdhnb4pb","d2c0c50d290
716c4f3a6c163754fd4d2",url= "https://apikey-v2-
17ohzcg9s8gag385pikw8c0rv66om8u9rdhnb4pb:d2c0c50d29071
6c4f3a6c163754fd4d2@fc0b7457-1856-4d19-a6d4-985e0054e85f-
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))
        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,
            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')
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',#"e2eb7c86020f84
2148cd36bb3a11086a"

inputs=[resources_pb2.Input(data=resources_pb2.Data(image=resour
ces_pb2.Image(base64=file_bytes))

```

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    ))
    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.imwrite(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,'moisture':moist,'humidity':humidity}
    print(myData)
    if(humidity!=None):

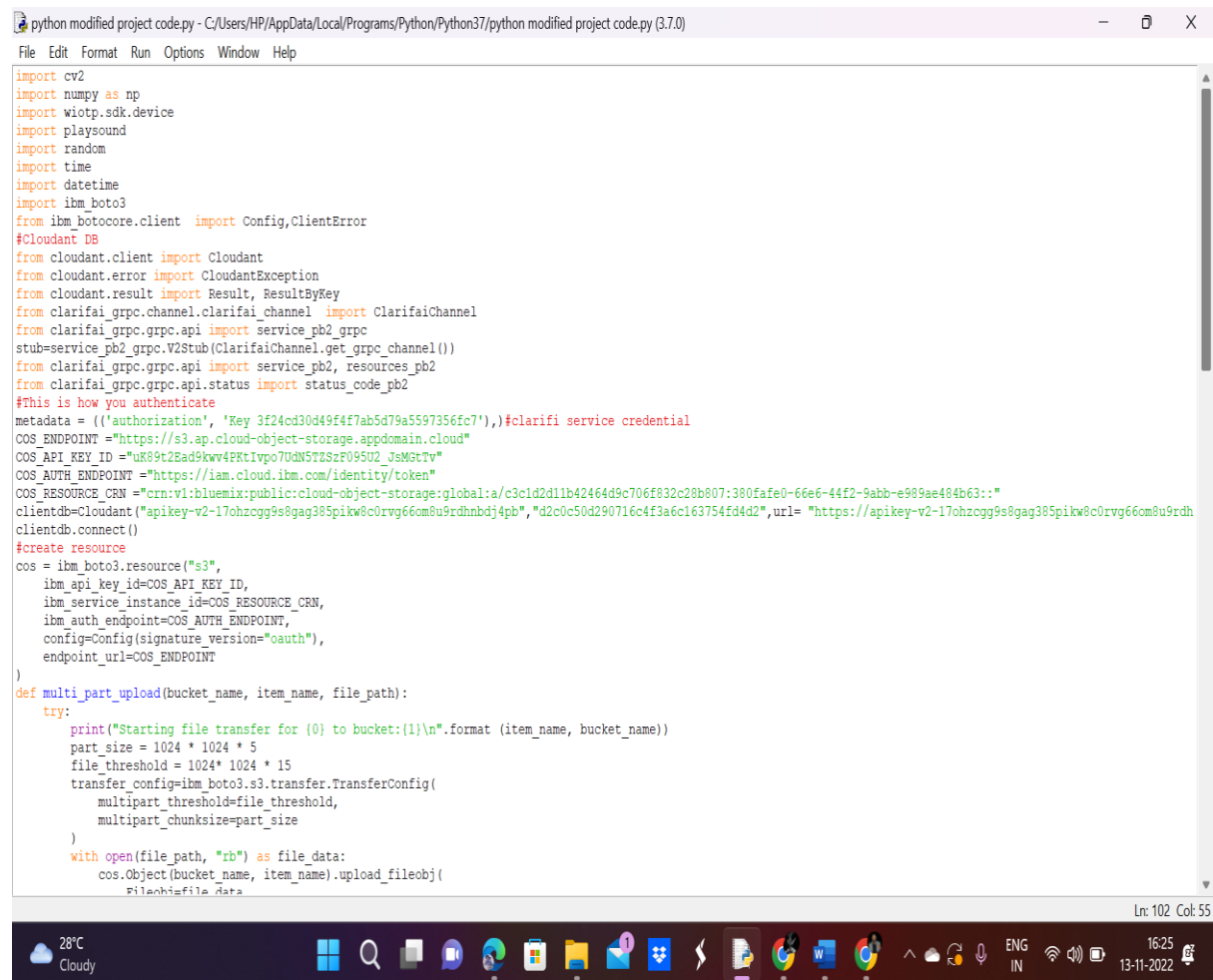
```

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        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()

```

## Python in 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 ="uR89t28ad9kwv4PKtIvpo7UdN57ZSzF095U2 JsMgTtv"
COS_AUTH_ENDPOINT ="https://iam.cloud.ibm.com/identity/token"
COS_RESOURCE_CRN ="crn:vl:bluemix:public:cloud-object-storage:global:a/c3c1d2d11b42464d9c706f832c28b807:380fafe0-66e6-44f2-9abb-e989ae484b63::"
clientdb=Cloudant("apikey-v2-17ohzcgg9s8gag385pikw8c0rvvg66cm8u9rdhnbj4pb","d2c0c50d290716c4f3a6c163754fd4d2",url= "https://apikey-v2-17ohzcgg9s8gag385pikw8c0rvvg66cm8u9rdh
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 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 {} Complete!\n".format(item_name))
except ClientError as be:
    print ("CLIENT ERROR: {}{}\n".format(be))
except Exception as e:
    print("Unable to complete multi-part upload: {}".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": "ko06ni",
        "typeId": "abod",
        "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

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```
*python modified project code.py - C:/Users/HP/AppData/Local/Programs/Python/Python37/python modified project code.py (3.7.0)*
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}
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="aaa03c3b3724a16a56b629203edc62c", # "e2eb7c96020f942148cd36bb3a11086a"
        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.imwrite(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

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```
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

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.imwrite(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 ("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()

Ln: 122 Col: 50
```

28°C Humid

## OUTPUT FOR PYTHON:

No Animal detected :

```
Python 3.7.4 Shell
File Edit Shell Debug Options Window Help
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}

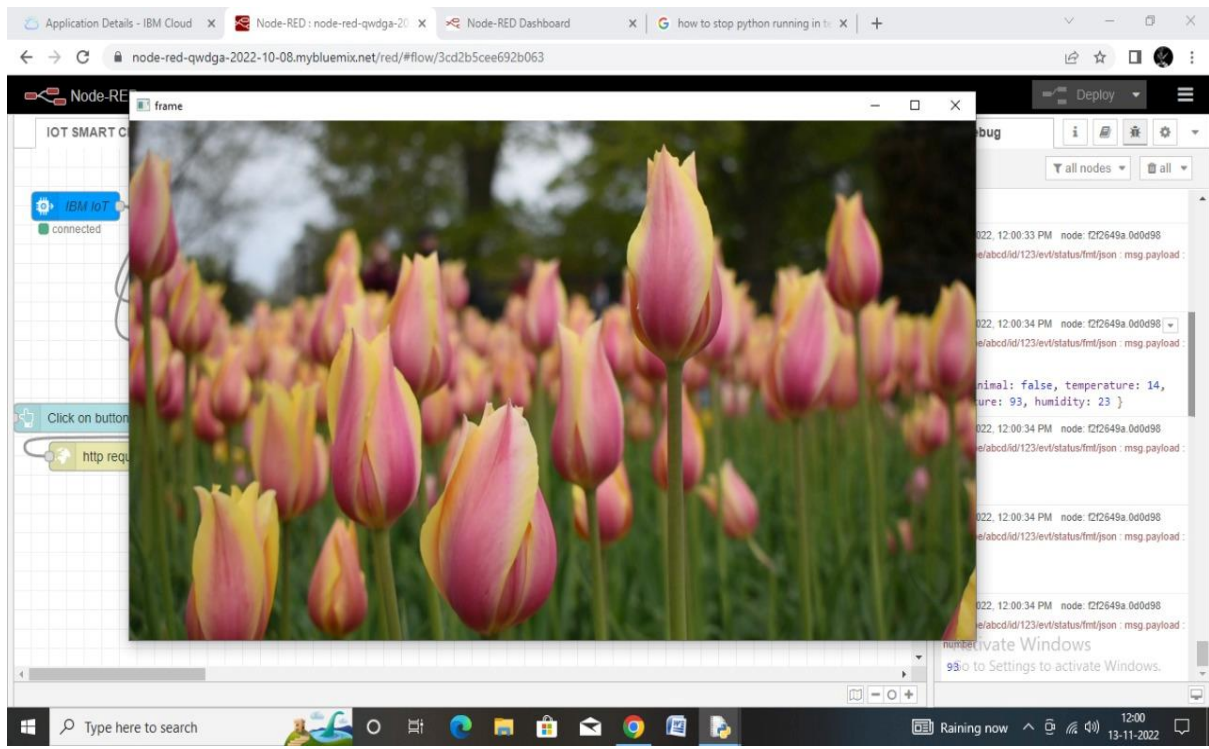
Activate Windows
Go to Settings to activate Windows.

Ln: 43 Col: 4
```

Type here to search

Raining now 12:00 13-11-2022





## Animal Detected:

```

Python 3.7.4 Shell
File Edit Shell Debug Options Window Help
===== RESTART: C:\python\Python37\python modified project code.py =====
2022-11-13 12:10:45,393 wiotp.sdk.device.client.DeviceClient INFO Connected successfully: d:kc06
ni:abcd:123
'sample1' successfully created.
File opened
{'Animal': False, 'temperature': 24, 'moisture': 17, 'humidity': 87}
Publish Ok..
Alert! Alert! animal detected
Starting file transfer for 22-11-13-12-11.jpg to bucket:adalin

CLIENT ERROR: An error occurred (NoSuchBucket) when calling the PutObject operation: The specified buc
ket does not exist.

Document successfully created.
{'Animal': True, 'temperature': 88, 'moisture': 21, 'humidity': 98}
Publish Ok..
Alert! Alert! animal detected
Starting file transfer for 22-11-13-12-11.jpg to bucket:adalin

CLIENT ERROR: An error occurred (NoSuchBucket) when calling the PutObject operation: The specified buc
ket does not exist.

Document successfully created.
{'Animal': True, 'temperature': 64, 'moisture': 66, 'humidity': 16}
Publish Ok..
Alert! Alert! animal detected
Starting file transfer for 22-11-13-12-11.jpg to bucket:adalin

Activate Windows
Go to Settings to activate Windows.
Ln: 22 Col: 0

```

