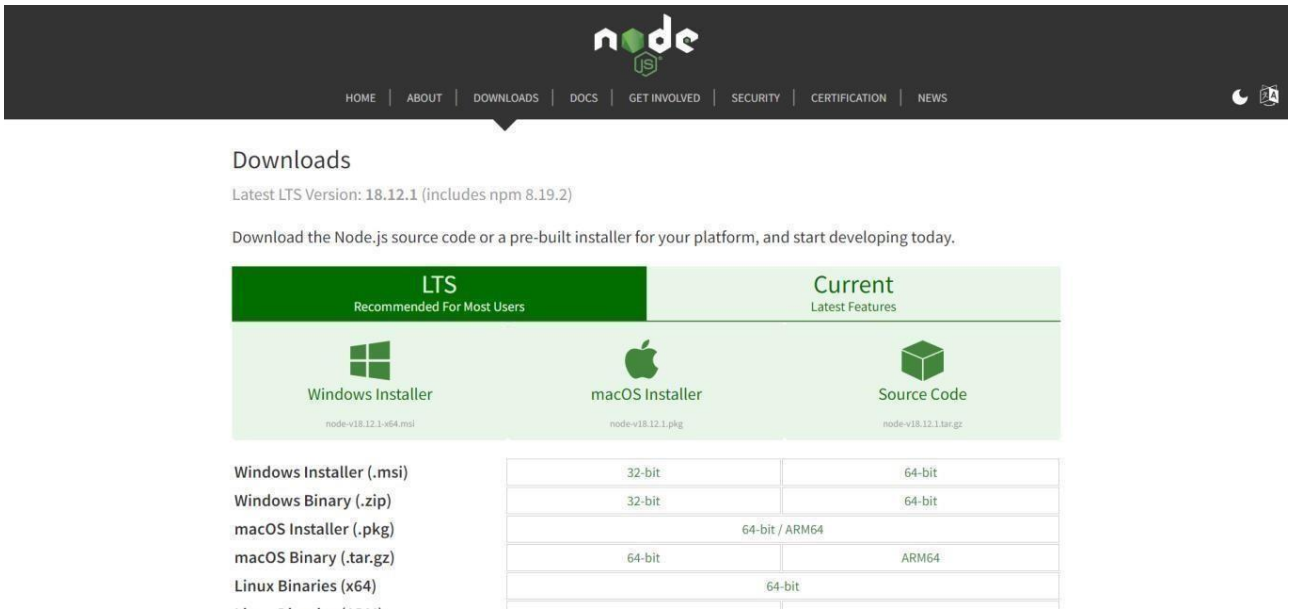
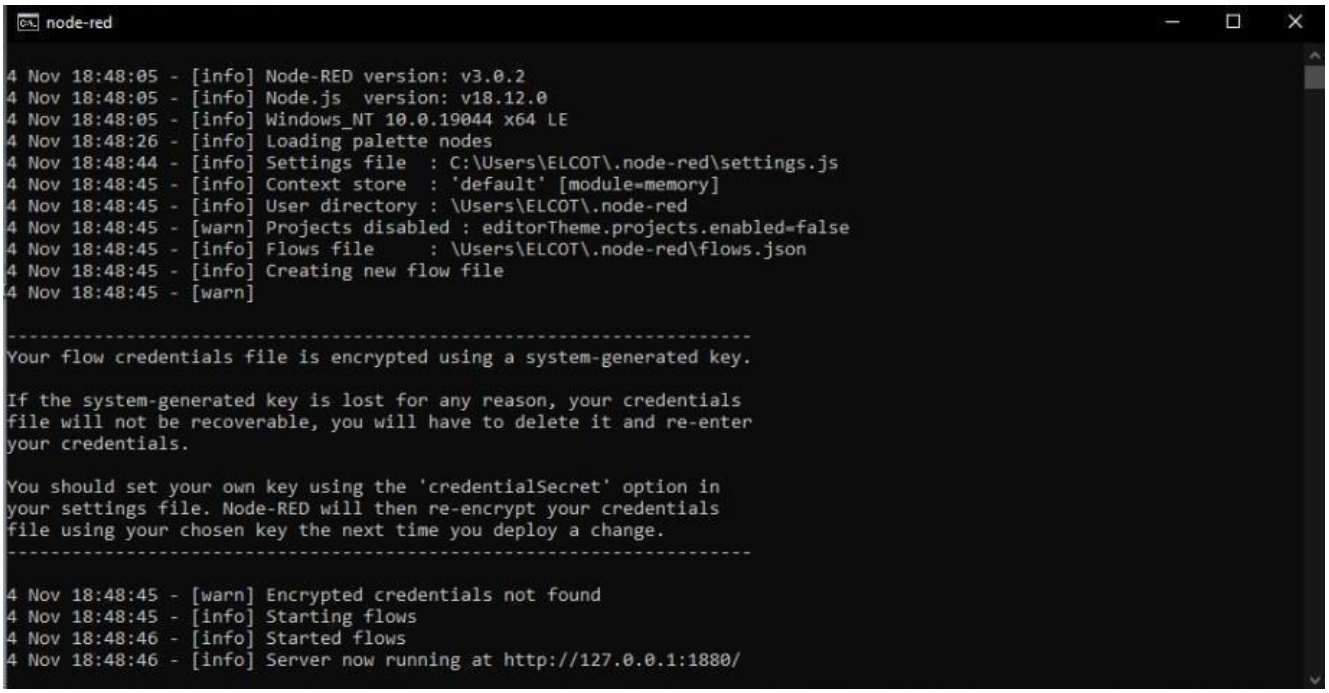
TEAM ID	PNT2022TMID04647
Project Name	IoT Based Smart Crop Protection System for Agriculture

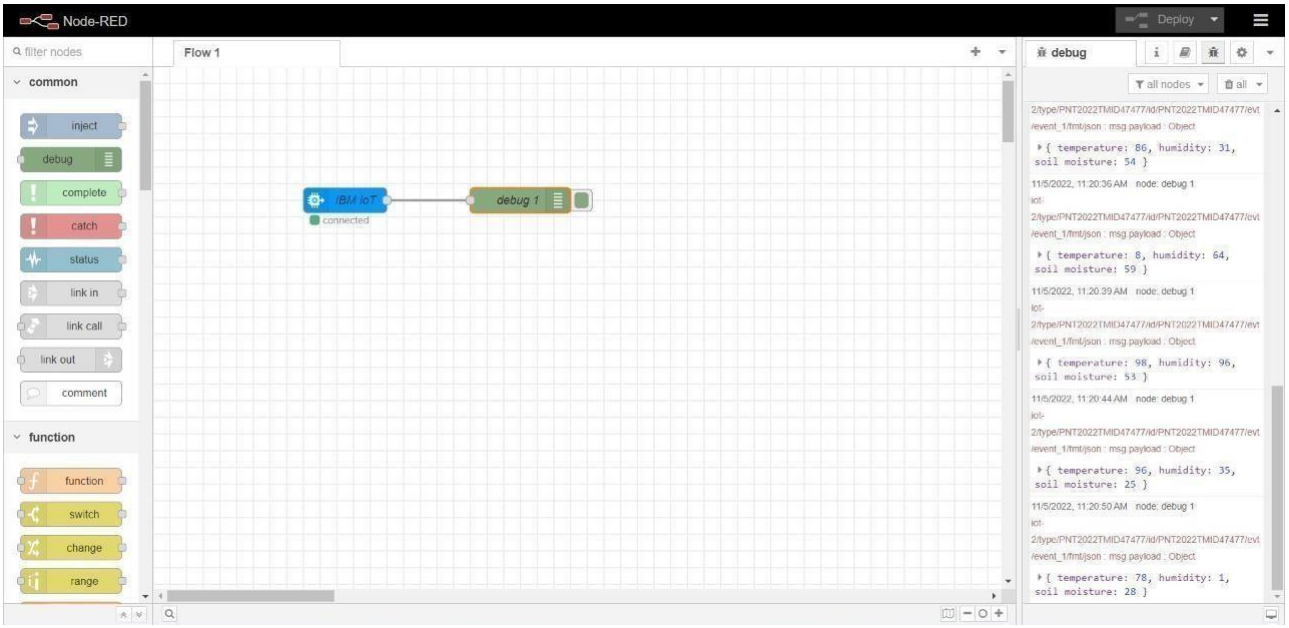
STEP 1: Download and Install NODE JS.



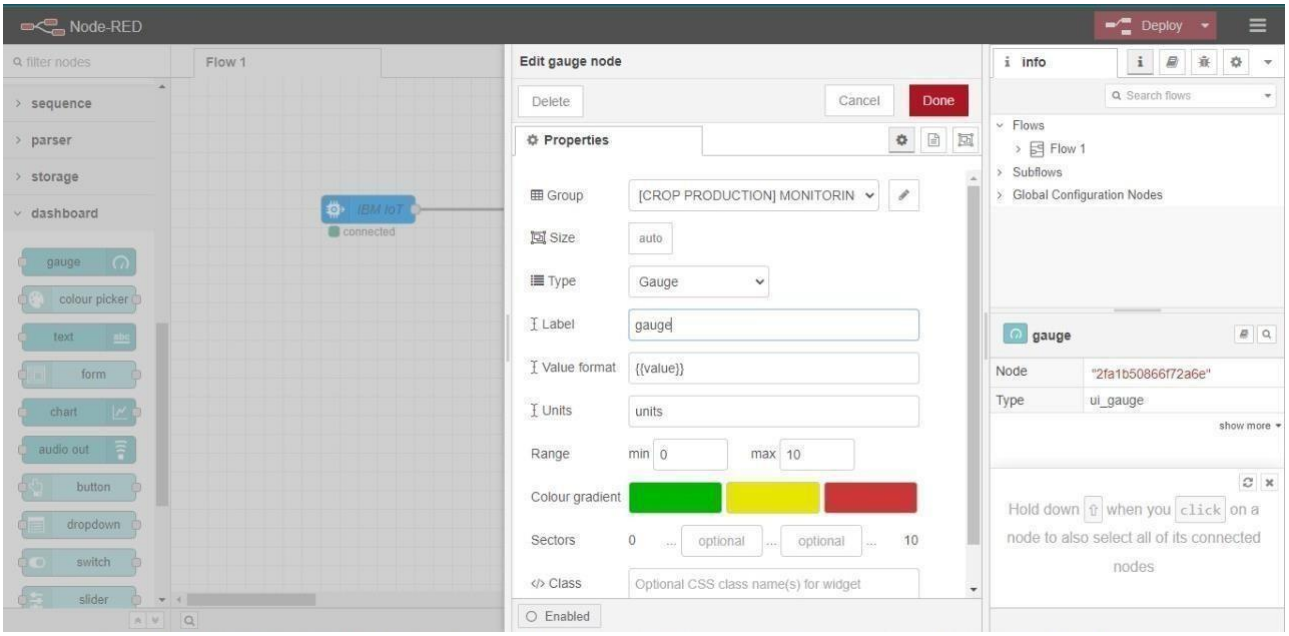
STEP 2: Setup node.js and configure command prompt for error check. open node-red fromthe generated link.



STEP 3: Connect IBM IOT in and Debug 1 and Deploy.



STEP 4: Edit gauge node (Here the gauge nodes are named as Temperature, Humidity and Soilmoisture).



STEP 5: **PYTHON CODE**

```
Python 3.10.7 (tags/v3.10.7:6cc6b13, Sep  5 2022, 14:08:36) [MSC v.1933 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
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 0620e202302b4508b90eab7efe7475e4'),)
COS_ENDPOINT = "https://s3.jp-tok.cloud-object-storage.appdomain.cloud"
COS_API_KEY_ID = "g5d4qO8EIgv4TWUCJj4hfEzgalqEjrDbE82AJDWlAOHo"
COS_AUTH_ENDPOINT = "https://iam.cloud.ibm.com/identity/token"
COS_RESOURCE_CRN = "crn:v1:bluemix:public:cloud-object-storage:global:a/c2fa2836eaf3434bbc8b5b58fefff3f0:62e450fd-4c82-4153-ba41-ccb53adb8111::"
clientdb = cloudant("apikey-W2nj1dnwtjO16V53LAVUCqPwc2aHTLmlj1xXvtdGKJBn", "88cc5f47c1a28afbfb8ad16161583f5a", url="https://d6c89f97-cf91-48b7-b14b-c99b2fe27c2f-bluemix.clouda
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"),
                     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')
```

```
        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='e9359dbe6ee44dbc8842ebe97247b201',
...         inputs=[resources_pb2.Input(data=resources_pb2.Data(image=resources_pb2.Image(base64=file_bytes))
```

```
...         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('Dhakshesh', picname+'.jpg', picname+'.jpg')
...                 json_document={"link":COS_ENDPOINT+'/'+'Dhakshesh'+'/'+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()
```

STEP 6: **OUTPUT**