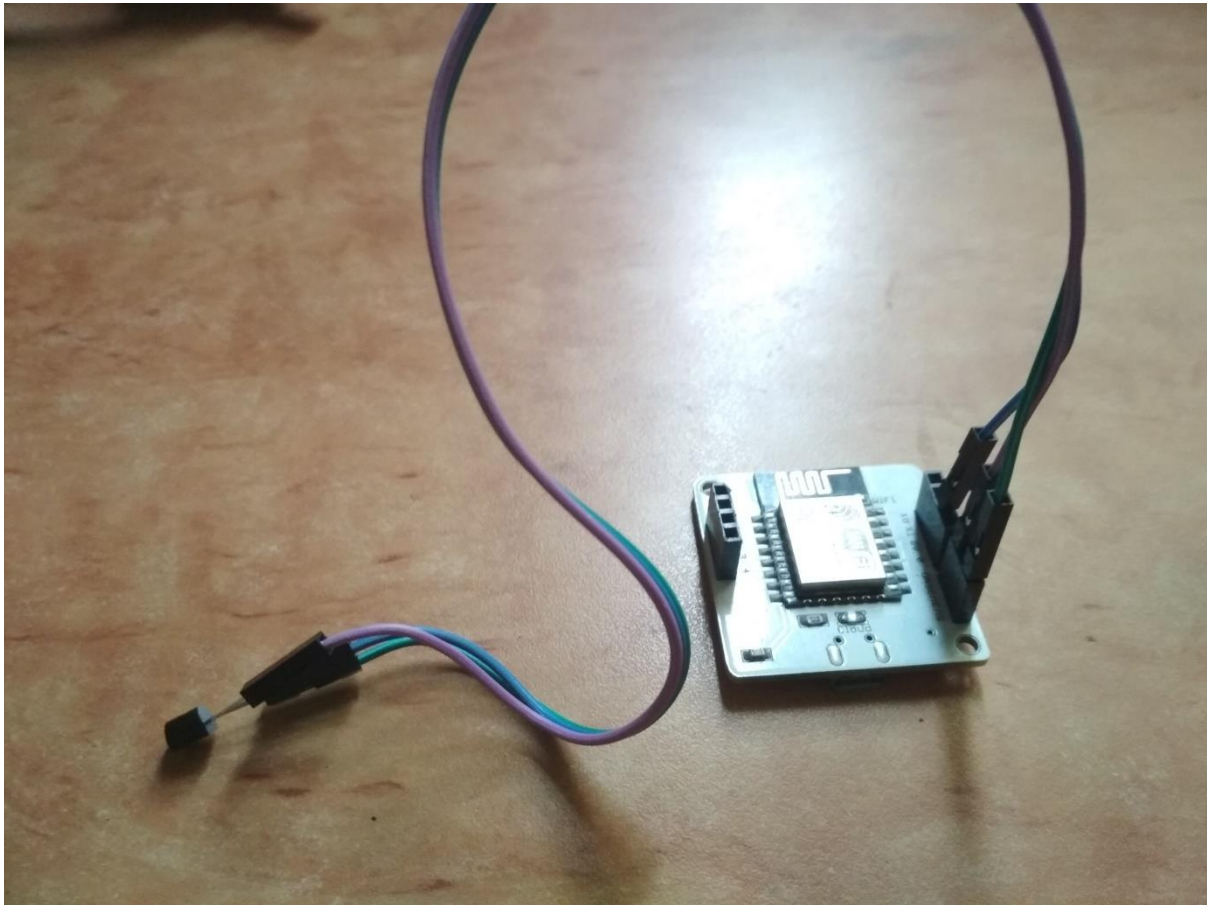
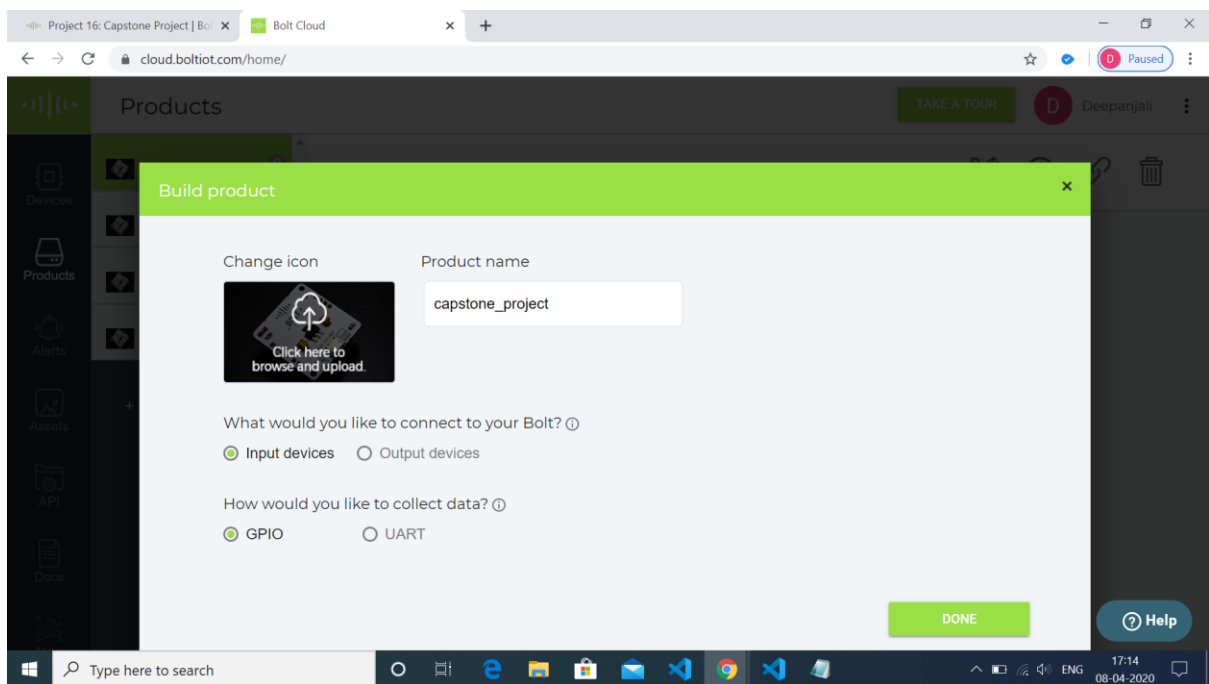


Capstone project

OBJECTIVE A:



OBJECTIVE B



Project 16: Capstone Project | Bolt Cloud

cloud.boltiot.com/home/?p_name=capstone_project

Products

light_monitor 0

led 0

tempmonitoringd... 0

tempmonitoring... 0

capstone_project 1

+ Add Product

API

Docs

ID: BOLT4627937 STATUS: ONLINE PRODUCT: capstone_project ACTIONS

TAKE A TOUR

Deepanjali

Help

Type here to search

OBJECTIVE C

Project 16: Capstone Project | Bolt Cloud

cloud.boltiot.com/configure/capstone_project

Products: Setup

capstone_project

Hardware Code

Step 1: Assemble the circuit using Bolt hardware module as per your requirement.
 Step 2: Select the pins as per circuit designed and assign a unique variable name to them.
 Step 3: Data collection rate: 5 Minutes

Note: Variable name can only contain lowercase alphanumeric characters and underscore and should start with an alphabet.

Pin	Variable Name
A0 Analog	temp

Feedback

Help

Type here to search

Project 13: Predicting Temperature Bolt Cloud

cloud.boltiot.com/configure/capstone_project

Products: Setup

capstone_project Hardware Code

Write your code in the code window below.

capstone_project js

Start typing your code below.

```
1 setChartLibrary('google-chart');
2 setChartTitle('Capstone Project');
3 setChartType('predictiongraph');
4 setAxisName('time_stamp','temp');
5 mul(0.0977);
6 plotChart('time_stamp','temp');
```

Note: Variable name can only contain lowercase alphanumeric characters and underscore and should start with an alphabet.

Pin	Variable Name
A0 Analog	temp

Feedback

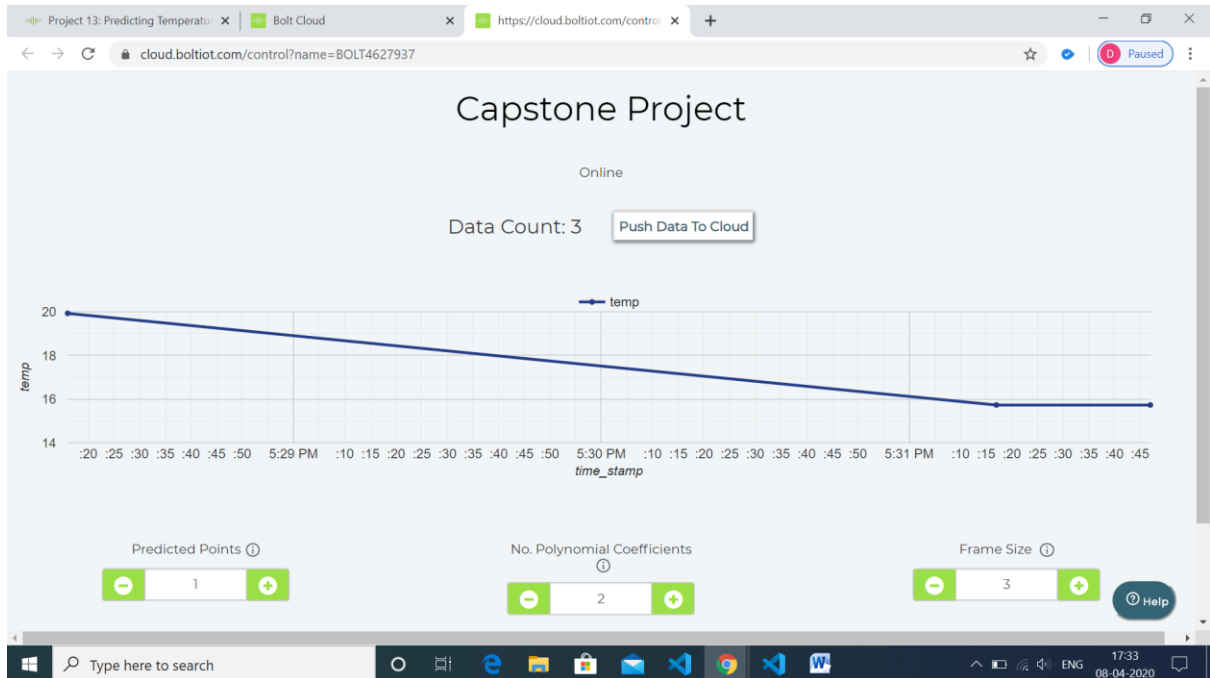
Help

Type here to search

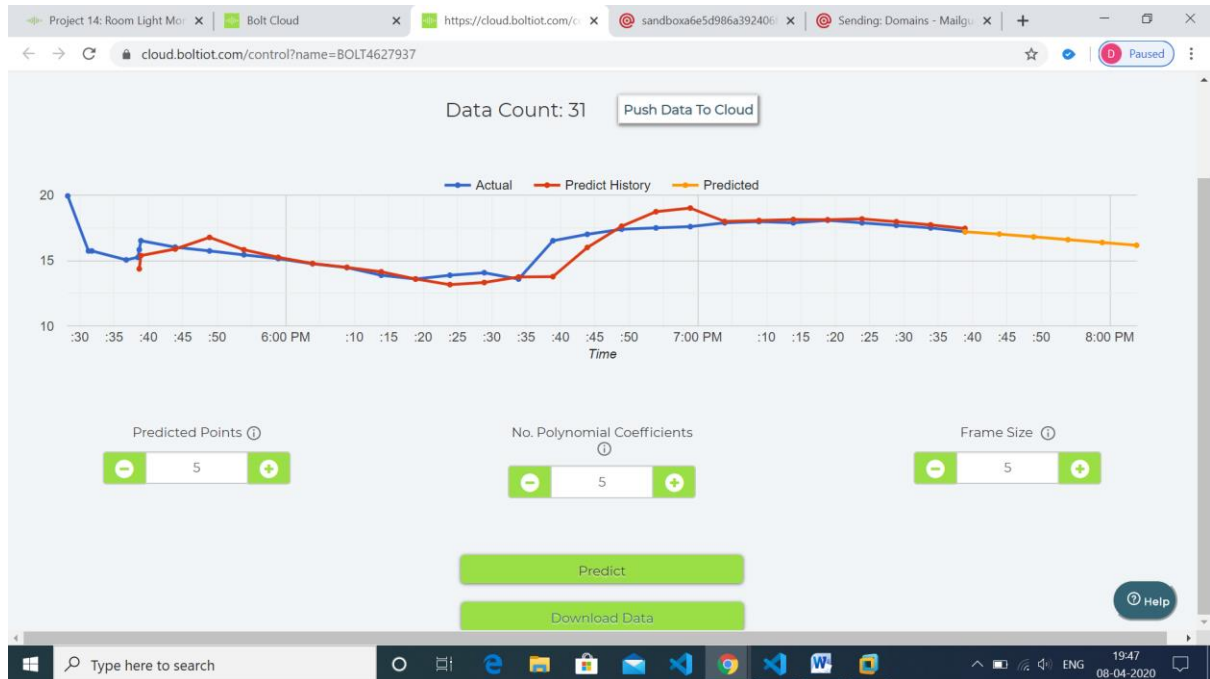
17:32 08-04-2020

OBJECTIVE D





OBJECTIVE E



OBJECTIVE F

```
GNU nano 2.9.3 configure.py
MAILGUN_API_KEY='9965fd0acb132ac037e70101fa3dd099-ed4dc7c4-24f7266a'
MAILGUN_URL='sandbox65d986a392406f9e579710cbc248a8.mailgun.org'
SENDER_EMAIL='test@sandbox65d986a392406f9e579710cbc248a8.mailgun.org'
RECIPIENT_EMAIL='deepanjali.pandit60@gmail.com'
API_KEY='cfa0b010-bfc5-4217-bca2-33005bec169c'
DEVICE_ID='BOLT4627937'
```


Activities Terminal Wed 08:09 hp@hp-virtual-machine: -

GNU nano 2.9.3 temp_monitor.py

```
import configure
from boltiot import Email,Bolt
import json,time
maximum_limit=175
minimum_limit=130
mybolt=Bolt(configure.API_KEY,configure.DEVICE_ID)
mailer=Email(configure.MAILGUN_API_KEY,configure.SANDBOX_URL,configure.SENDER_EMAIL,configure.RECIPIENT_EMAIL)
while True:
    print('Reading fridge temperature')
    response=mybolt.analogRead('A0')
    data=json.loads(response)
    print('sensor value'+str(data['value']))
    try:
        sensor_value=int(data['value'])
        if sensor_value>maximum_limit or sensor_value<minimum_limit:
            print('sending email')
            response=mailer.send_email("alert","temperature in freezer has crossed threshold.Sensor value is"+str(sensor_value))
            response_text=json.loads(response.text)
            print("response for mailgun:"+str(response_text['message']))
    except Exception as e:
        print("error")
        print(e)
    time.sleep(60)
```

Get Help Write Out Where Is Cut Text Justify Cur Pos Undo Mark Text To Bracket
Exit Read File Replace Uncut Text To Linter Go To Line Redo Copy Text WhereIs Next

```
^Z
[5]+ Stopped python3 temp_monitor.py
hp@hp-virtual-machine:~$ sudo nano temp_monitor.py
hp@hp-virtual-machine:~$ python3 temp_monitor.py
Reading fridge temperature
sensor value171
Reading fridge temperature
sensor value174
Reading fridge temperature
sensor value176
sending email
response for mailgun:Queued. Thank you.
^Z
[6]+ Stopped python3 temp_monitor.py
hp@hp-virtual-machine:~$
```

The screenshot shows a Gmail interface on a Windows desktop. The left sidebar displays the 'Inbox' with 432 emails. The main area shows a list of emails from 'test@sandboxa6e5d986a3' with the subject 'temperature in freezer has'. The right pane shows a detailed view of an email with the subject 'alert' and the body text: 'temperature in freezer has crossed threshold.Sensor value is176'. The desktop taskbar at the bottom shows various application icons and the system clock indicating 20:13 on 08-04-2020.

OBJECTIVE G


```
Activities Terminal
Wed 08:26
hp@hp-virtual-machine: -
GNU nano 2.9.3 anomoly.py
import conf, json, time, math, statistics
from boltiot import Sns, Bolt
def compute_bounds(history_data, frame_size, factor):
    if len(history_data) < frame_size :
        return None

    if len(history_data) > frame_size :
        del history_data[0:len(history_data)-frame_size]
        Mn = statistics.mean(history_data)
        Variance = 0
        for data in history_data :
            Variance += math.pow((data-Mn),2)
        Zn = factor * math.sqrt(Variance / frame_size)
        High_bound = history_data[frame_size-1]+Zn
        Low_bound = history_data[frame_size-1]-Zn
        return [High_bound, Low_bound]

mybolt = Bolt(conf.API_KEY, conf.DEVICE_ID)
sns = Sns(conf.SID, conf.AUTH_TOKEN, conf.TO_NUMBER, conf.FROM_NUMBER)
history_data=[]

while True:
    response = mybolt.analogRead('A0')
    data = json.loads(response)
    if data['success'] != 1:
        print("There was an error while retriving the data.")
        print("This is the error: "+data['value'])
        time.sleep(10)
        continue
    print("This is the value "+data['value'])
    sensor_value=0
    try:
        sensor_value = int(data['value'])
    except e:
        print("There was an error while parsing the response: ",e)
        continue

    bound = compute_bounds(history_data, conf.FRAME_SIZE, conf.MUL_FACTOR)
    if not bound:
        required_data_count = conf.FRAME_SIZE - len(history_data)
        print("Not enough data to compute Z-score. Need ", required_data_count, " more data points")
        history_data.append(int(data['value']))
        time.sleep(10)
        continue

    try:
        if sensor_value > bound[0]:
            print("Door open. Sending an SMS.")
            response = sns.send_sms("Fridge door is open")
            print("This is the response ", response)
        elif sensor_value < bound[1]:
            print("Fridge door open. Sending an SMS.")
            response = sns.send_sms("Fridge door open")
            print("This is the response ", response)
        history_data.append(sensor_value);
    except Exception as e:
        print("Error", e)
        time.sleep(10)
```

```
Activities Terminal
Wed 08:26
hp@hp-virtual-machine: -
GNU nano 2.9.3 anomoly.py
        continue
    print("This is the value "+data['value'])
    sensor_value=0
    try:
        sensor_value = int(data['value'])
    except e:
        print("There was an error while parsing the response: ",e)
        continue

    bound = compute_bounds(history_data, conf.FRAME_SIZE, conf.MUL_FACTOR)
    if not bound:
        required_data_count = conf.FRAME_SIZE - len(history_data)
        print("Not enough data to compute Z-score. Need ", required_data_count, " more data points")
        history_data.append(int(data['value']))
        time.sleep(10)
        continue

    try:
        if sensor_value > bound[0]:
            print("Door open. Sending an SMS.")
            response = sns.send_sms("Fridge door is open")
            print("This is the response ", response)
        elif sensor_value < bound[1]:
            print("Fridge door open. Sending an SMS.")
            response = sns.send_sms("Fridge door open")
            print("This is the response ", response)
        history_data.append(sensor_value);
    except Exception as e:
        print("Error", e)
        time.sleep(10)
```

OBJECTIVE H

```
Activities Terminal * Wed 08:26 * hp@hp-virtual-machine: ~
File Edit View Search Terminal Help
This is the value 169
This is the value 171
This is the value 171
This is the value 172
This is the value 172
This is the value 173
This is the value 174
This is the value 173
This is the value 175
This is the value 172
This is the value 171
This is the value 172
This is the value 172
This is the value 172
This is the value 176
This is the value 174
This is the value 173
This is the value 174
This is the value 175
This is the value 174
This is the value 173
This is the value 172
^Z
[14]+ Stopped python3 anomoly.py
hp@hp-virtual-machine:~$ python3 anomoly.py
This is the value 169
Not enough data to compute Z-score. Need 10 more data points
This is the value 169
Not enough data to compute Z-score. Need 9 more data points
This is the value 159
Not enough data to compute Z-score. Need 8 more data points
This is the value 158
Not enough data to compute Z-score. Need 7 more data points
This is the value 158
Not enough data to compute Z-score. Need 6 more data points
This is the value 157
Not enough data to compute Z-score. Need 5 more data points
This is the value 157
Not enough data to compute Z-score. Need 4 more data points
This is the value 158
Not enough data to compute Z-score. Need 3 more data points
This is the value 157
Not enough data to compute Z-score. Need 2 more data points
This is the value 157
Not enough data to compute Z-score. Need 1 more data points
This is the value 157
This is the value 168
Door open. Sending an SMS.
This is the response <Twilio.Api.V2010.MessageInstance account_sid=AC1998b67ebe2649d548df460233b42cf0 sid=SM15a78e2754664fdcade851b12a1c0695>
This is the value 166
This is the value 170
This is the value 173
This is the value 173
This is the value 174
This is the value 171
^Z
[15]+ Stopped python3 anomoly.py
hp@hp-virtual-machine:~$ sudo nano anomoly.py
[sudo] password for hp:
hp@hp-virtual-machine:~$
```

8:55



← 57575566



New contact?



Save 57575566 to your contacts

[Add contact](#)

[Report spam](#)

Wednesday, Mar 25 • 5:14 PM



Your Twilio verification code is:
885010



Your Twilio verification code is:
303352

Sent from your Twilio trial
account - The Current
temperature sensor value is 310



Sent from your Twilio trial
account - The Current
temperature sensor value is 310

8:54 PM



Sent from your Twilio trial
account - Fridge door is open

Now • via [Vodafone IN](#)



Text message
from Vodafone IN



