Firebase

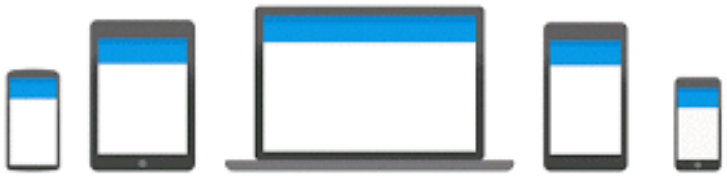
Firebase-Cloud Functions

adding timestamp to sensor data upload to Firebase

Cloud Functions
for Firebase

Dr. Sarwan Singh

NIELIT Chandigarh

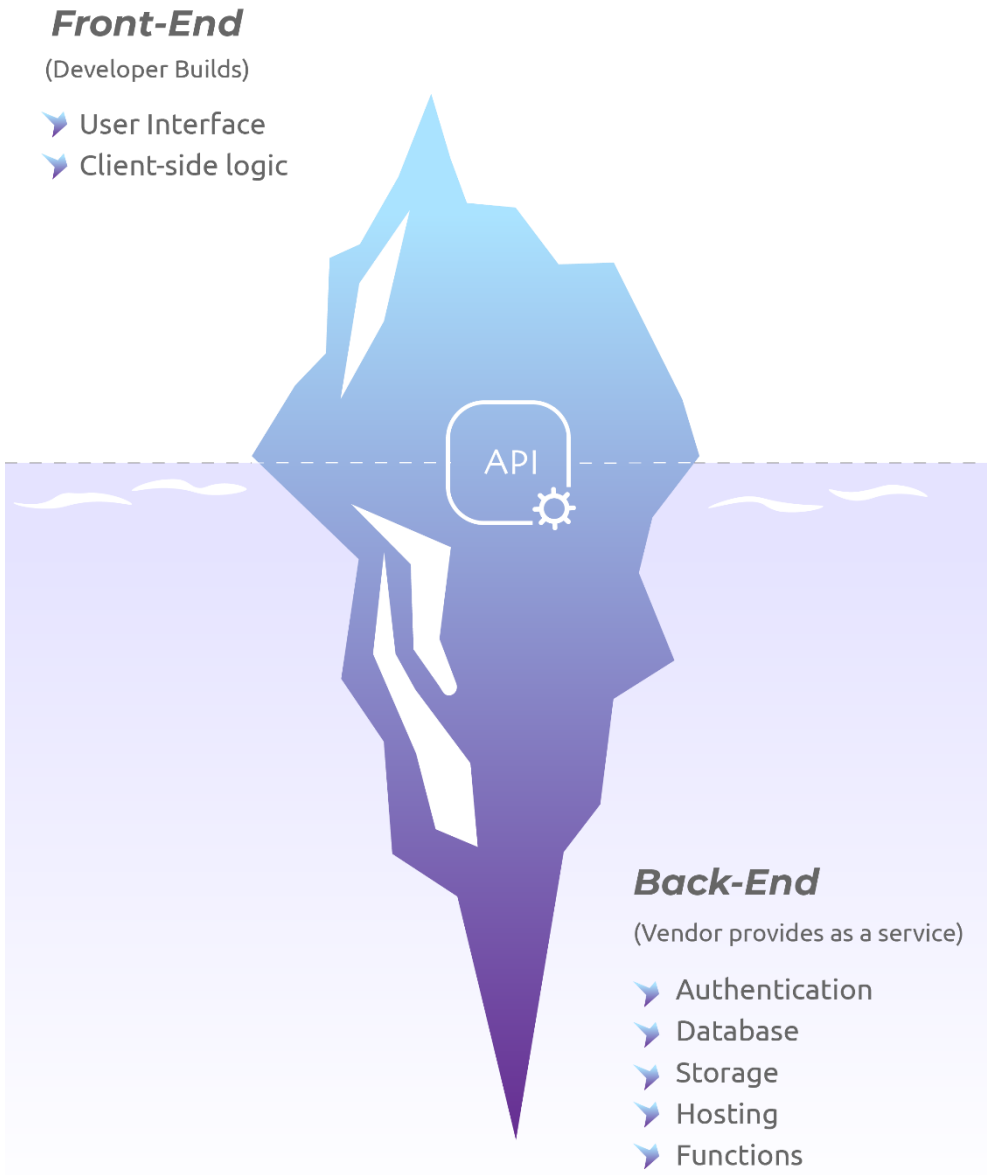


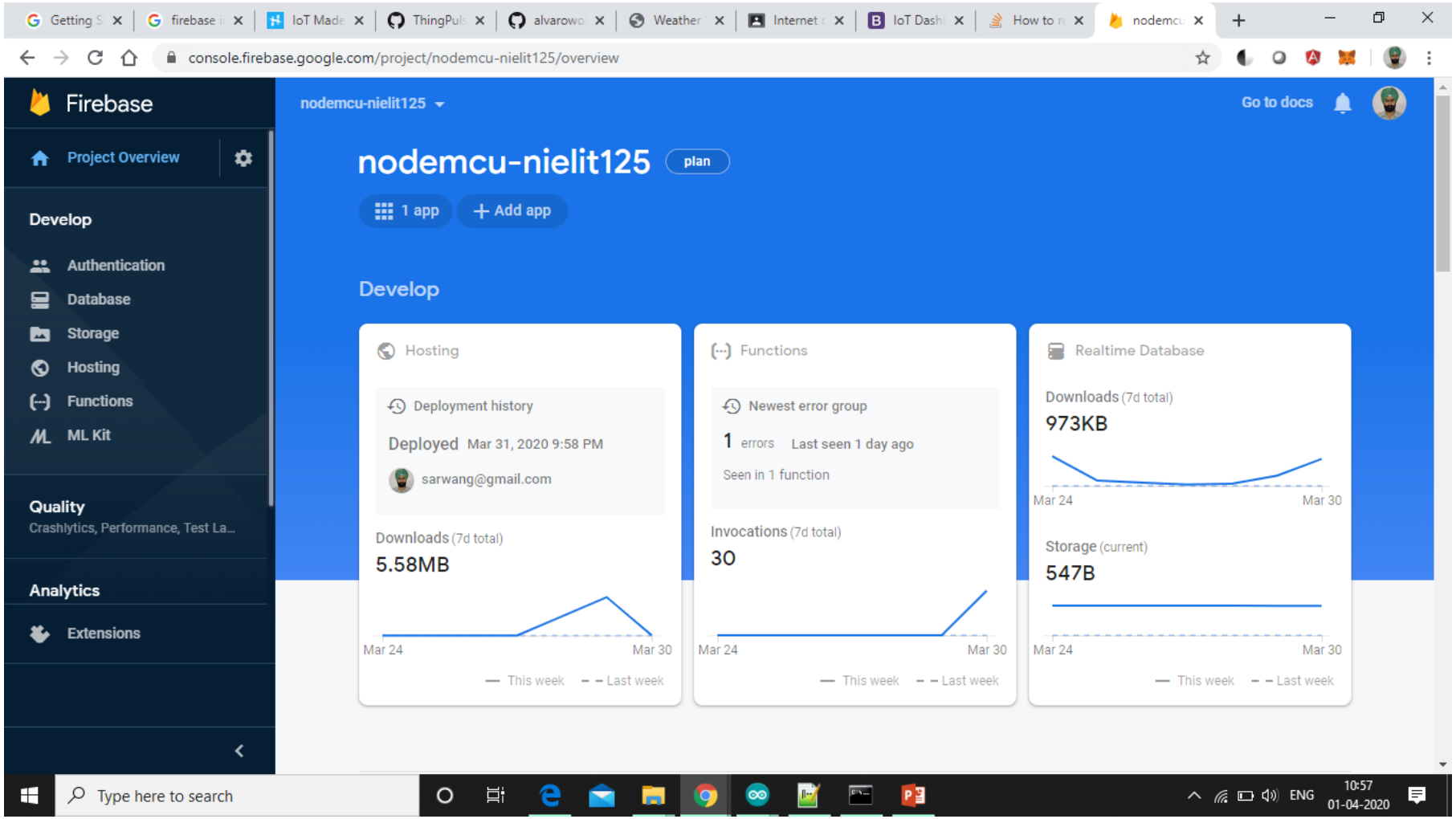
Agenda

- Firebase – NodeMCU

References

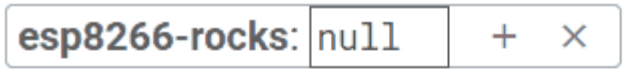
- google
- firebase.google.com




console.firebase.google.com/project/nodemcu-nielit125/overview
Firebase
nodemcu-nielit125
Go to docs
Project Overview
Develop
Authentication
Database
Storage
Hosting
Functions
ML Kit
Quality
Crashlytics, Performance, Test La...
Analytics
Extensions
nodemcu-nielit125
plan
1 app
Add app
Develop
Hosting
Deployment history
Deployed Mar 31, 2020 9:58 PM
sarwang@gmail.com
Downloads (7d total)
5.58MB
Mar 24
Mar 30
This week
Last week
Functions
Newest error group
1 errors Last seen 1 day ago
Seen in 1 function
Invocations (7d total)
30
Realtime Database
Downloads (7d total)
973KB
Storage (current)
547B
Type here to search
ENG
10:57
01-04-2020

Timestamping data


```
{
"timestamped_measures" : {
"-LHmx0njlsZ3hkCFzjSC" : {
"timestamp" : 1532010700350,
"value" : 910
},
"-LHmx1PcieyEm04aOo2a" : {
"timestamp" : 1532010702641,
"value" : 907
},
"-LHmx1leagyrTQxa9zii" : {
"timestamp" : 1532010703986,
"value" : 840
},
...
}
```

Timestamping data


```
{
"timestamped_measures" : {
"-LHmx0njIsZ3hkCFzjSC" : {
"timestamp" : 1532010700350,
"value" : 910
},
"-LHmx1PcieyEm04aOo2a" : {
"timestamp" : 1532010702641,
"value" : 907
},
"-LHmx1leagyrTQxa9zii" : {
"timestamp" : 1532010703986,
"value" : 840
},
...
}
```


Each measure should now be an object (described in JSON) having two key/val. pairs, the keys being "timestamp" and "value". And, at an upper level, this object is the value associated with the key called a “Firebase push ID”, for instance

"-LHmx0njIsZ3hkCFzjSC"

for the first record in the above example

Unix Epoch time

- The Epoch time is the number of **seconds** that have elapsed since 00:00:00 Coordinated Universal Time (UTC), Thursday, 1 January 1970
- Epoch time expressed in **milliseconds**

First option: ESP8266 generates a timestamp

- With this option, ESP8266 should be aware of time, *i.e.* have a **Real Time Clock** (RTC, hardware or software recreated). It should loop over the following actions:
- get the 10-bit luminosity measure.
- get Epoch time.
- Create an object with "value" and "timestamp" populated with the measure and the Epoch time.
- push this object to our Firebase Realtime Database using the function:

String push(*const* String &*path*, *const* JsonVariant &*value*)

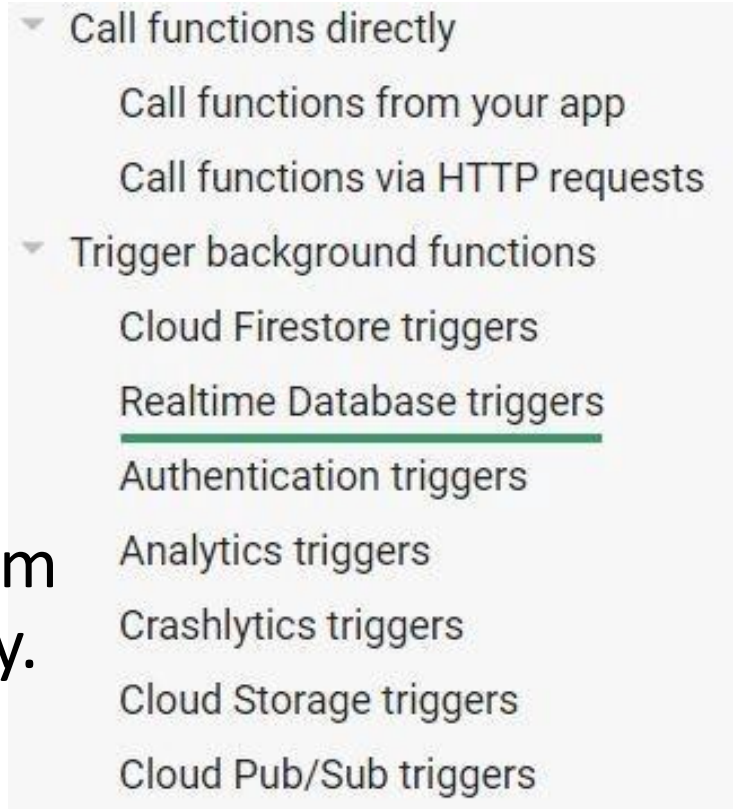
Second option: Firebase Cloud Function issues timestamp

- A Firebase Cloud Function issues the timestamp when a value is pushed to the Firebase Realtime Database.
- **Firebase Cloud Functions** (or “Cloud Functions for Firebase”) are part of **Google Cloud Platform** and are **functions executed in a Node environment** on Google servers. A Firebase Cloud Function can be:
- called from an app involving Firebase (directly or via a HTTP request),
- automatically triggered upon an event on Firebase products:

Cloud Functions
for Firebase

Second option: Firebase Cloud Function issues timestamp

- automatically triggered upon an event on Firebase products:



- The **small drawback** of this option is that we will timestamp the push to Firebase Realtime Database, not the measure. But the temporal gap between them is only about seconds, depending on network latency.

Cloud functions for Firebase

- Firebase Cloud Functions are part of what is sometimes called **Functions as a Service** (FaaS) and are one aspect of the famous **serverless architecture**, *i.e.* we don't need to provide our own servers to host and run them.

Writing cloud functions

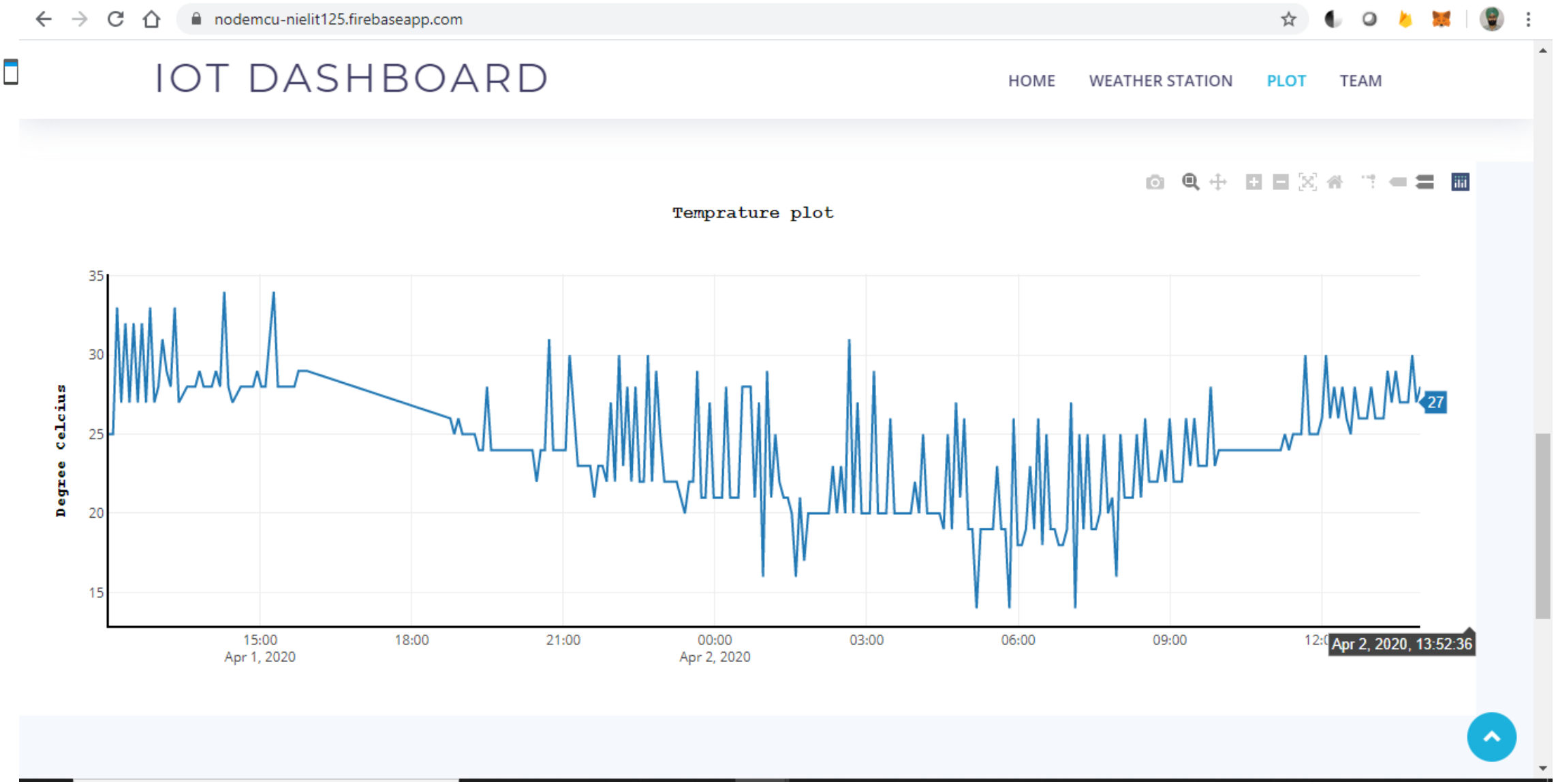
- https://firebase.google.com/docs/functions/

1	Set up Cloud Functions	Install the Firebase CLI and initialize Cloud Functions in your Firebase project.
2	Write functions	Write JavaScript code (or TypeScript code to transpile at deployment) to handle events from Firebase services, Google Cloud services, or other event providers.
3	Deploy and monitor	Deploy your functions using the Firebase CLI. You can use the Firebase console to view and search through your logs.

firebase deploy --only functions

C:\Windows\System32\cmd.exe

```
operable program or batch file.

f:\IoT WKP\firebase\firebaseweb\functions\src>firebase deploy --only functions

=== Deploying to 'nodemcu-nielit125'...

i  deploying functions
Running command: npm --prefix "$RESOURCE_DIR" run lint

> functions@ lint f:\IoT WKP\firebase\firebaseweb\functions
> tslint --project tsconfig.json

Running command: npm --prefix "$RESOURCE_DIR" run build

> functions@ build f:\IoT WKP\firebase\firebaseweb\functions
> tsc

+  functions: Finished running predeploy script.
i  functions: ensuring necessary APIs are enabled...
+  functions: all necessary APIs are enabled
i  functions: preparing functions directory for uploading...
i  functions: packaged functions (36.13 KB) for uploading
+  functions: functions folder uploaded successfully
i  functions: creating Node.js 8 function formatData(us-central1)...
+  functions[formatData(us-central1)]: Successful create operation.

+  Deploy complete!

Project Console: https://console.firebase.google.com/project/nodemcu-nielit125/overview

f:\IoT WKP\firebase\firebaseweb\functions\src>
f:\IoT WKP\firebase\firebaseweb\functions\src>
```


nodemcu-nielit125.firebaseapp.com
IOT DASHBOARD
HOME
WEATHER STATION
PLOT
TEAM
Temprature plot
Degree Celcius
35
30
25
20
15
15:00
Apr 1, 2020
18:00
21:00
00:00
Apr 2, 2020
03:00
06:00
09:00
27
Apr 2, 2020, 13:52:36

nodemcu-nielit125.firebaseapp.com

IOT DASHBOARD

HOME WEATHER STATION PLOT TEAM