**Signs With Smart Connectivity For Better Road Safety**

**Batch no: B11-5A1E**

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**PROBLEM-SOLUTION FIT**

Software Required:

Python IDLE

System Required:

RAM-Minimum 4GB Processor-Min. Configuration OS-Windows/Linux/MAC

* To replace the static signboards, smart connected sign boards are used.
* These smart connected sign boards get the speed limitations from a web app using weather API and update automatically.
* Based on the weather changes the speed may increase or decrease.
* Based on the traffic and fatal situations the diversion signs are displayed.
* Guide(Schools), Warning and Service(Hospitals, Restaurant) signs are also displayed accordingly.
* Different modes of operations can be selected with the help of buttons.

**Prerequisites**

Basic knowledge of the following cloud services:

* IBM Watson IoT Platform
* Node-RED Service
* Cloudant DB
* Create an IBM Cloud Account

IBM Cloud Services

* Basic knowledge of the following cloud services:
* IBM Watson IoT Platform
* Node-RED Service
* Software

Install the Python IDE.

* Create An Account In OpenweatherMap Website
* Using Openweathermap we can get current weather details of a location and integrate this with our project

### Project Objectives

* Gain knowledge of Watson IoT Platform.
* Connecting IoT devices to the Watson IoT platform and exchanging the data and to display values.
* Gain knowledge of OpenWeatherMap API Service
* Creating a Web Application through which the user interacts with the device.

**Project Flow:**

* Receiving road sign values to the IBM IoT platform from Node-RED Web UI
* Weather conditions can be viewed in the Web Application

To accomplish this, we have to complete all the activities and tasks listed below:

* Create and configure IBM Cloud Services
  + Create IBM Watson IoT Platform
  + Create a device & configure the IBM IoT Platform
  + Create Node-RED service
  + Create a database in Cloudant DB to store location data
* Develop a web Application using Node-RED Service.
  + Develop the web application using Node-RED
* Develop a python script to publish the location details to the IBM IoT platform

### Create And Configure IBM Cloud Services

Create and configure the IBM Cloud services which are being used in completing this project.

**Create IBM Watson IoT Platform And Device**

* IBM Watson IoT platform acts as the mediator to connect the web application to IoT device, so create the IBM Watson IoT platform.
* In order to connect the IoT device to the IBM cloud, create a device in the IBM Watson IoT platform and get the device credentials.
* Configure the connection security and create API keys that are used in the Node-RED service for accessing the IBM IoT Platform.

### Create Node-RED Service

To create a web application create a Node-RED service.

### Develop The Python Script

##### Create a code snippet using python to

##### Extract weather data from OpenWeatherMap using APIs

##### Send the extracted data to the cloud

##### Receive data from the cloud and view it in the python compiler

**Publish Data To The IBM Cloud**

* Python code is used to send random sensor data to the cloud and also to receive commands from the cloud.  
  Below is the reference link provided for the python program to publish and subscribe from the IBM Watson IoT Platform.
* When the commands are received just print the statements which represent the control of the devices.

**Develop A Web Application Using Node-RED Service.**

* A Web UI should be created in Node-RED using dashboard nodes available in it.

**Develop The Web Application Using Node-RED**

Configure the Node-RED flow to send data to the IBM IoT platform.

### Use Dashboard Nodes For Creating UI(Web App)