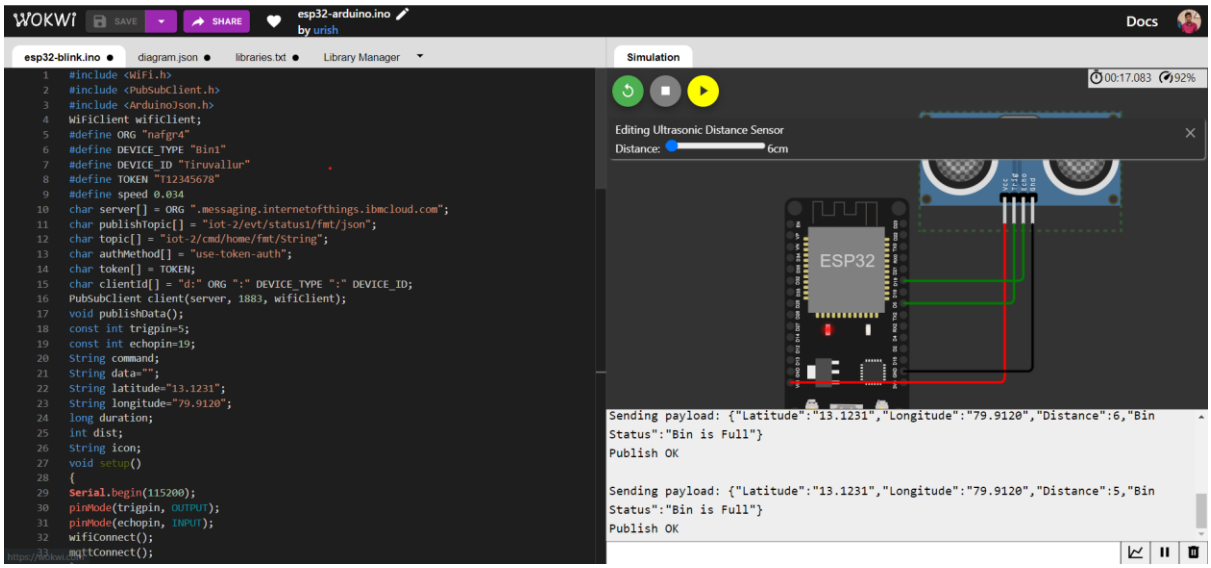
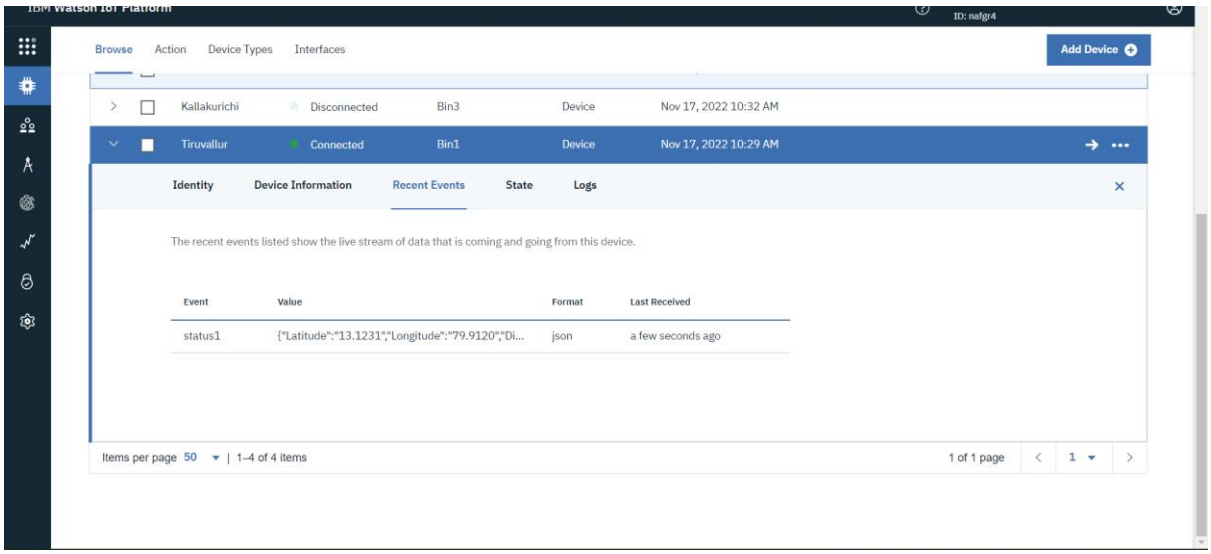
```
#include<WiFi.h>
#include<PubSubClient.h>
#include<ArduinoJson.h>
WiFiClient wifiClient;
#define ORG "nafgr4"
#define DEVICE_TYPE "Bin1"
#define DEVICE_ID "Tiruvallur"
#define TOKEN "T12345678"
#define speed 0.034
char server[]= ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[]="iot-2/evt/status1/fmt/json";
char topic[]="iot-2/cmd/home/fmt/String";
char authMethod[]="use-token-auth";
char token[]= TOKEN;
char clientId[]="d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server,1883, wifiClient);
void publishData();
constint trigpin=5;
constint echopin=19;
String command;
String data="";
String latitude="13.1231";
String longitude="79.9120";
long duration;
int dist;
String icon;
voidsetup()
{
Serial.begin(115200);
pinMode(trigpin,OUTPUT);
pinMode(echopin,INPUT);
wifiConnect();
mqttConnect();
}
voidloop(){
publishData();
delay(500);
if(!client.loop()){
mqttConnect();
}
}
void wifiConnect(){
Serial.print("Connecting to ");
Serial.print("Wifi");
WiFi.begin("Wokwi-GUEST","",6);
while(WiFi.status()!= WL_CONNECTED){
delay(500);
Serial.print(".");
```

```
}
Serial.print("WiFi connected, IP address: ");Serial.println(WiFi.localIP());
}
void mqttConnect(){
if(!client.connected()){
Serial.print("Reconnecting MQTT client to ");Serial.println(server);
while(!client.connect(clientId, authMethod, token)){
Serial.print(".");
Serial.print("*");
delay(1000);
}
initManagedDevice();
Serial.println();
}
}
void initManagedDevice(){
if(client.subscribe(topic)){
Serial.println(client.subscribe(topic));
Serial.println("subscribe to cmd OK");
}
else{
Serial.println("subscribe to cmd FAILED");
}
}
void publishData()
{
digitalWrite(trigpin,LOW);
digitalWrite(trigpin,HIGH);
delayMicroseconds(10);
digitalWrite(trigpin,LOW);
duration=pulseIn(echopin,HIGH);
dist=duration*speed/2;
if(dist<20){
icon="Bin is Full";
}
else{
icon="Bin is not Full";
}
DynamicJsonDocument doc(1024);
String payload;
doc["Latitude"]=latitude;
doc["Longitude"]=longitude;
doc["Distance"]=dist;
doc["Bin Status"]=icon;
serializeJson(doc, payload);
delay(3000);
Serial.print("\n");
Serial.print("Sending payload: ");
```

```
Serial.println(payload);
if(client.publish(publishTopic,(char*) payload.c_str())){
Serial.println("Publish OK");
}
else{
Serial.println("Publish FAILED");
}
}
```



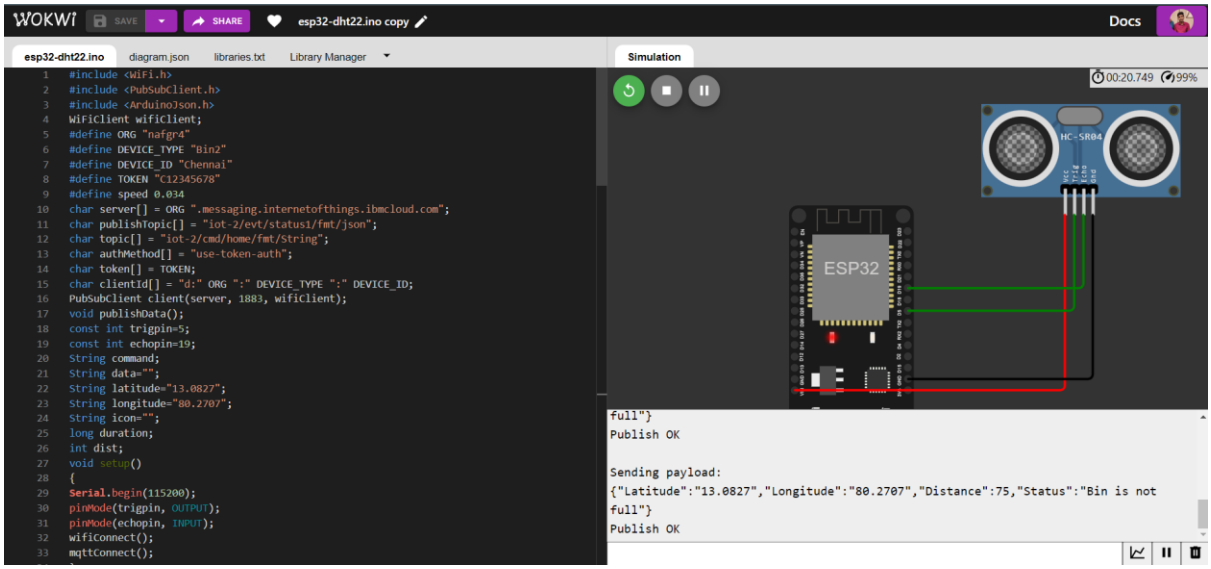


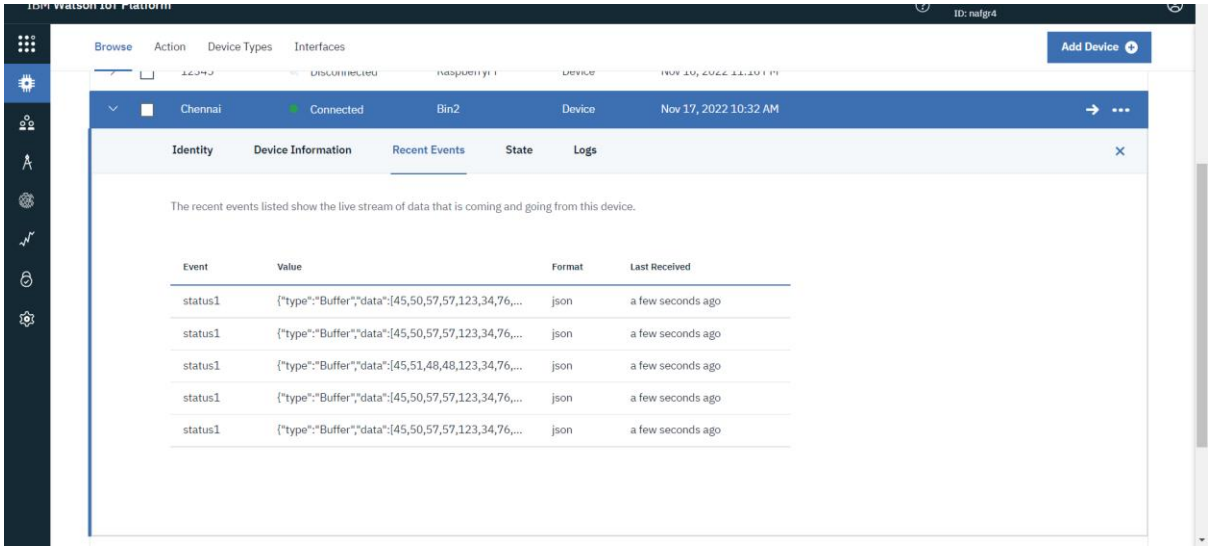
Bin2

```
#include<WiFi.h>
#include<PubSubClient.h>
#include<ArduinoJson.h>
WiFiClient wifiClient;
#define ORG "nafgr4"
#define DEVICE_TYPE "Bin2"
#define DEVICE_ID "Chennai"
#define TOKEN "C12345678"
#define speed 0.034
char server[]= ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[]="iot-2/evt/status1/fmt/json";
char topic[]="iot-2/cmd/home/fmt/String";
char authMethod[]="use-token-auth";
char token[]= TOKEN;
char clientId[]="d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server,1883, wifiClient);
void publishData();
constint trigpin=5;
constint echopin=19;
String command;
String data="";
String latitude="13.0827";
String longitude="80.2707";
long duration;
int dist;
String icon;
voidsetup()
{
Serial.begin(115200);
pinMode(trigpin,OUTPUT);
pinMode(echopin,INPUT);
wifiConnect();
mqttConnect();
}
voidloop(){
publishData();
delay(500);
if(!client.loop()){
mqttConnect();
}
}
void wifiConnect(){
Serial.print("Connecting to ");
Serial.print("Wifi");
WiFi.begin("Wokwi-GUEST","",6);
while(WiFi.status()!= WL_CONNECTED){
delay(500);
Serial.print(".");
```

```
}
Serial.print("WiFi connected, IP address: ");Serial.println(WiFi.localIP());
}
void mqttConnect(){
if(!client.connected()){
Serial.print("Reconnecting MQTT client to ");Serial.println(server);
while(!client.connect(clientId, authMethod, token)){
Serial.print(".");
Serial.print("*");
delay(1000);
}
initManagedDevice();
Serial.println();
}
}
void initManagedDevice(){
if(client.subscribe(topic)){
Serial.println(client.subscribe(topic));
Serial.println("subscribe to cmd OK");
}
else{
Serial.println("subscribe to cmd FAILED");
}
}
void publishData()
{
digitalWrite(trigpin,LOW);
digitalWrite(trigpin,HIGH);
delayMicroseconds(10);
digitalWrite(trigpin,LOW);
duration=pulseIn(echopin,HIGH);
dist=duration*speed/2;
if(dist<20){
icon="Bin is Full";
}
else{
icon="Bin is not Full";
}
DynamicJsonDocument doc(1024);
String payload;
doc["Latitude"]=latitude;
doc["Longitude"]=longitude;
doc["Distance"]=dist;
doc["Bin Status"]=icon;
serializeJson(doc, payload);
delay(3000);
Serial.print("\n");
Serial.print("Sending payload: ");
```

```
Serial.println(payload);
if(client.publish(publishTopic,(char*) payload.c_str())){
Serial.println("Publish OK");
}
else{
Serial.println("Publish FAILED");
}
}
```





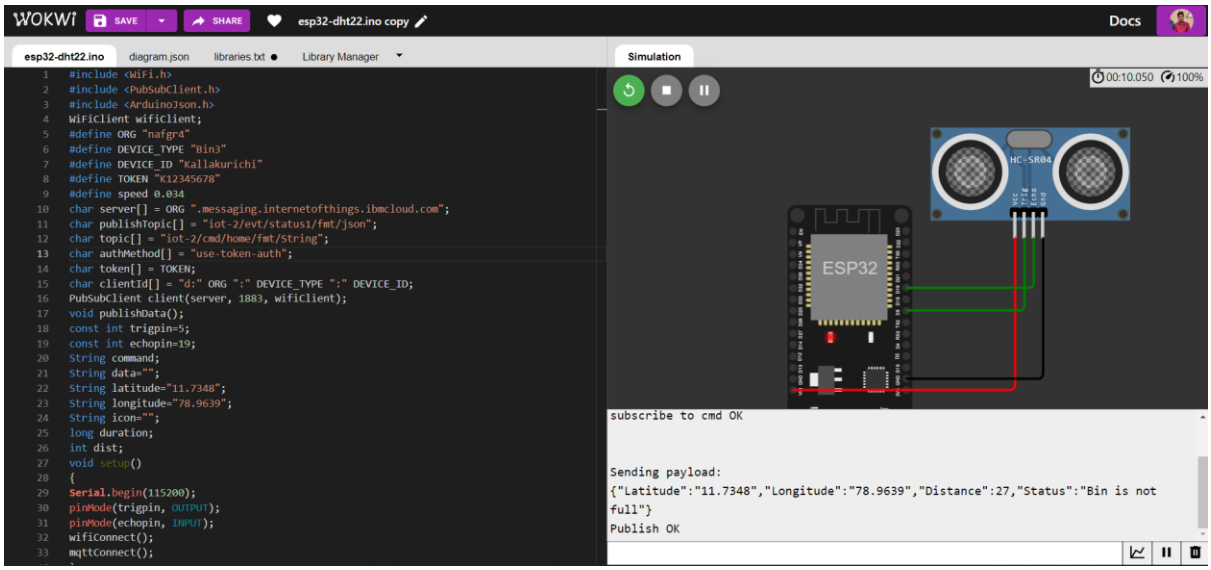
Bin3

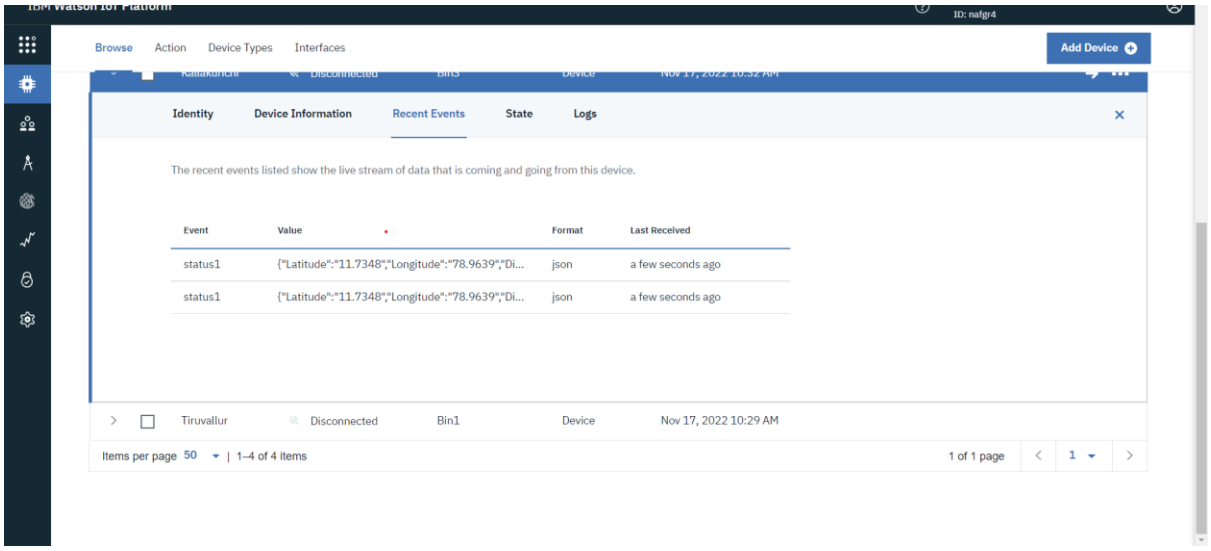
```
#include<WiFi.h>
#include<PubSubClient.h>
#include<ArduinoJson.h>
WiFiClient wifiClient;
```

```
#define ORG "nafgr4"
#define DEVICE_TYPE "Bin3"
#define DEVICE_ID "Kallakurichi"
#define TOKEN "K12345678"
#define speed 0.034
char server[]= ORG ".messaging.internetofthings.ibmcloud.com";
char publishTopic[]="iot-2/evt/status1/fmt/json";
char topic[]="iot-2/cmd/home/fmt/String";
char authMethod[]="use-token-auth";
char token[]= TOKEN;
char clientId[]="d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
PubSubClient client(server,1883, wifiClient);
void publishData();
constint trigpin=5;
constint echopin=19;
String command;
String data="";
String latitude="11.7348";
String longitude="78.9639";
String icon="";
long duration;
int dist;
voidsetup()
{
Serial.begin(115200);
pinMode(trigpin,OUTPUT);
pinMode(echopin,INPUT);
wifiConnect();
mqttConnect();
}
voidloop(){
publishData();
delay(500);
if(!client.loop()){
mqttConnect();
}
}
void wifiConnect(){
Serial.print("Connecting to ");
Serial.print("Wifi");
WiFi.begin("Wokwi-GUEST","",6);
while(WiFi.status()!= WL_CONNECTED){
delay(500);
Serial.print(".");
}
Serial.print("WiFi connected, IP address: ");Serial.println(WiFi.localIP());
}
void mqttConnect(){
```

```
if(!client.connected()){
Serial.print("Reconnecting MQTT client to ");Serial.println(server);
while(!client.connect(clientId, authMethod, token)){
Serial.print(".");
Serial.print("*");
delay(1000);
}
initManagedDevice();
Serial.println();
}
}
void initManagedDevice(){
if(client.subscribe(topic)){
Serial.println(client.subscribe(topic));
Serial.println("subscribe to cmd OK");
}
else{
Serial.println("subscribe to cmd FAILED");
}
}
void publishData()
{
digitalWrite(trigpin,LOW);
digitalWrite(trigpin,HIGH);
delayMicroseconds(10);
digitalWrite(trigpin,LOW);
duration=pulseIn(echopin,HIGH);
dist=duration*speed/2;
if(dist<20){
icon="Bin is full";
}
else{
icon="Bin is not full";
}
DynamicJsonDocument doc(1024);
String payload;
doc["Latitude"]=latitude;
doc["Longitude"]=longitude;
doc["Distance"]=dist;
doc["Status"]=icon;
serializeJson(doc, payload);
delay(3000);
Serial.print("\n");
Serial.print("Sending payload: ");
Serial.println(payload);
if(client.publish(publishTopic,(char*) payload.c_str())){
Serial.println("Publish OK");
}
```

```
else{
Serial.println("Publish FAILED");
}
}
```





Final Output