

SMART WASTE MANAGEMENT SYSTEM FOR METEROPOLITAN CITIES

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WOKWI SIMULATION

The screenshot displays the Wokwi web-based simulation environment. The left pane shows the Arduino sketch code for an ESP32 microcontroller. The code includes libraries for Wi-Fi, MQTT, and an LCD display. It defines IBM Watson IoT credentials and configures the device to publish sensor data to a specific topic in the cloud. The right pane shows a 3D simulation of the hardware, including an ESP32 board, a DHT11 temperature and humidity sensor, an ultrasonic sensor, and an LCD display. The simulation status bar at the top right indicates a runtime of 00:32.692 and 93% completion. The bottom right pane shows the MQTT publish logs, confirming successful data transmission.

```
1 #include <WiFi.h> // library for wifi
2 #include <PubSubClient.h> // library for MQTT
3 #include <LiquidCrystal_I2C.h>
4 #include <Json.h>
5 LiquidCrystal_I2C lcd(0x27, 20, 4);
6
7 //----- credentials of IBM Accounts -----
8
9 #define ORG "lyot2m" // IBM organisation id
10 #define DEVICE_TYPE "ESP" // Device type mentioned in ibm watson
11 #define DEVICE_ID "12345" // Device ID mentioned in ibm watson
12 #define TOKEN "87654321" // Token
13
14 //----- customise above values -----
15
16 char server[] = ORG ".messaging.internetofthings.ibmcloud.com";
17 char publishTopic[] = "iot-2/evt/data/fmt/json";
18 char topic[] = "iot-2/cmd/led/fmt/String";
19 char authMethod[] = "use-token-auth";
20 char token[] = TOKEN;
21 char clientId[] = "d:" ORG ":" DEVICE_TYPE ":" DEVICE_ID;
22
23 //-----
24
25 WiFiClient wificlient;
26 PubSubClient client(server, 1883, wificlient);
27
```

Simulation

00:32.692 93%

Publish OK

Sending payload: {400.01 }

Publish OK

Sending payload: {400.01 }

Publish OK