

Naan Mudhalvan – IoT Project



Project Name: Traffic Management

Project Description: Use IoT devices and data analytics to monitor traffic flow and congestion in real-time. This information can be accessible on a platform or through mobile apps, aiding commuters in choosing optimal routes.

Team Name: Proj_224783_Team_2

Idea Name: GPS manager

Team Member Details

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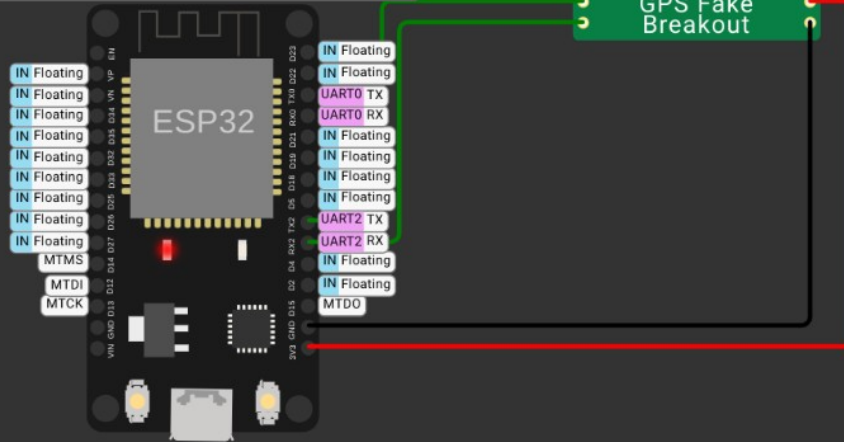
Evaluator Name: Jeba Sundar

Simulation

Code



WiFi: Connected to Wokwi-GUEST (Public IoT Gateway)



SERIAL MONITOR

CHIPS CONSOLE

Latitude: -23.46621704
Longitude: -51.84006500
Speed: 17.96 Km/h
X: 3610.82
Y: -4595.14



Simulation:

ESP32 is connected with a GPS chip through uart pins

The device is sends data with the help of wokwi's wifi

Sample output data is logged in the serial monitor

```
1 #include "NMEA.h"
2 #include "WiFi.h"
3 #include <FirebaseESP32.h>
4 #define LEN(arr) ((int)(sizeof(arr) / sizeof(arr)[0]))
5
6 union {
7     char bytes[4];
8     float valor;
9 } velocidadeGPS;
10
11 float latitude;
12 float longitude;
13
14 NMEA gps(GPRMC);
15
16
17 void setup() {
18     Serial.begin(115200);
19     Serial2.begin(9600);
20
21     Serial.println("Initializing WiFi...");
22     WiFi.mode(WIFI_STA); Serial.println("Connecting to WiFi ");
23     WiFi.begin("Wokwi-GUEST", "");
24     while (WiFi.status() != WL_CONNECTED) {
```

Main driver code for the esp32 board

```
89
90 typedef struct {
91     uart_dev_t uart0;
92     uint32_t gps_tx_index;
93 } chip_state_t;
94
95
96 static void chip_timer_event (void *user_data);
97
98
99 void chip_init(void) {
100     setvbuf(stdout, NULL, _IOLBF, 1024);
101     chip_state_t *chip = malloc(sizeof(chip_state_t));
102
103     const uart_config_t uart_config = {
104         .tx          = pin_init("TX", INPUT_PULLUP),
105         .rx          = pin_init("RX", INPUT),
106         .baud_rate   = 9600,
107         .user_data   = chip,
108     };
109
110     chip->uart0      = uart_init(&uart_config);
111     chip->gps_tx_index = 0;
112
```

Custom code that simulates the functioning of a gps