Chittagong University of Engineering and Technology

Department of Electrical and Electronic Engineering

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Course Title: Electronic Shop Practice

Project Title: Geolocation tracker using SIM 808 GPS GSM Module and Arduino.

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Problem Statement: To make a Geolocation tracker using SIM 808 GPS GSM Module and Arduino.

Introduction:

Geolocation refers to any type of technology that can identify a geographic location and a core feature of web & mobile apps across every industry-detect and stream location data to a live –updating map to smoothly watch location updates. In geolocation tracker SIM808 module contains both GPS & GPRS technologies, where a GPS tracking unit is a device normally carried by a moving vehicle or person that uses the global positioning system to determine & track its precise location. The global positioning system is a satellite based navigation system which contains a GPS module to receive the GPS signal & calculates the coordinate system.

Equipment:

- SIM808 (Tk 3500)
- Cable (Tk 200)
- Arduino (Tk 250)
- Power Adaptor (Tk 180)

Working principle:

SIM808 is all in one module with GSM, GPRS, GPS & Bluetooth. It has two antenna sockets one for GSM & other for GPS. A stub antenna is used for GSM. And magnetic external patch is used for GPS. Sent massage is received by the GSM module which is connected to the system & sends massage data to the arduino. Then arduino reads it and extract main massage from the whole massage. And then compare it with predefined massage in arduino code. After that arduino reads coordinates by extracting data from GPS module that gets the location information from satellites in the form of latitude & longitude and send it to the user by using GSM module.

Connection Diagram:
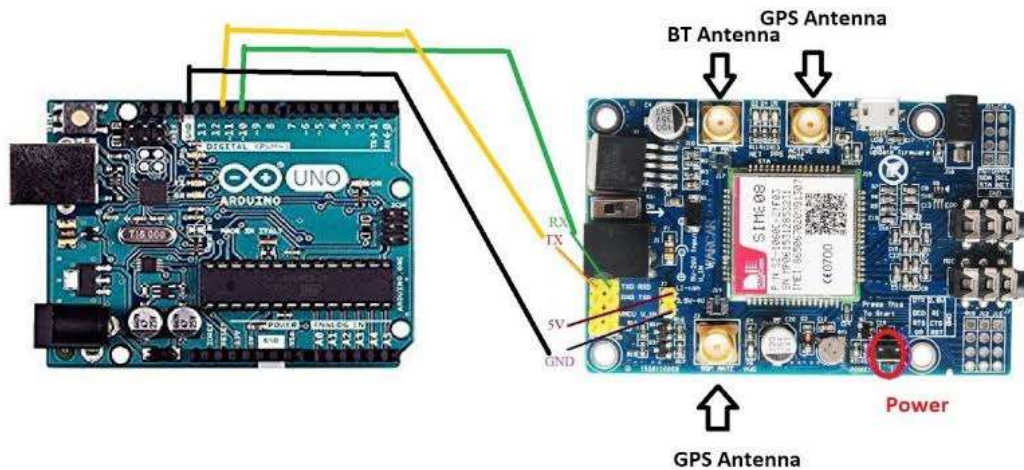
Working Procedure:

- ❖ At first the sim card was inserted to the GSM module.
- ❖ Connecting the GSM module to the adapter, it was turned on.
- ❖ Then waiting some time, the blinking rate of status LED or network LED was found.(GSM module takes some time to establish connection with mobile network)
- ❖ After established the connection successfully the network LED was blinking continuously.
- ❖ After that the ground pin of arduino & GSM was shorted.
- ❖ Then the code was uploaded.
- ❖ After that the serial pin of arduino (Rx,Tx) is used as the communication between GSM & Arduino is serial . So the connection GSM Tx ->Arduino Rx and GSM Rx -> Arduino Tx was provided.

Code: For SIM808 we used the following code:

```
#include <SoftwareSerial.h>
SoftwareSerial sim808(7,8);
char phone_no[] = "xxxxxxx"; // replace with your phone no.
String data[5];
#define DEBUG true
String state,timegps,latitude,longitude;
void setup() {
 sim808.begin(9600);
 Serial.begin(9600);
 delay(50);
 sim808.print("AT+CSMP=17,167,0,0");  // set this parameter if empty SMS received
 delay(100);
 sim808.print("AT+CMGF=1\r");
 delay(400);
sendData("AT+CGNSPWR=1",1000,DEBUG);
 delay(50);
 sendData("AT+CGNSSEQ=RMC",1000,DEBUG);
 delay(150);
 }
void loop() {
 sendTabData("AT+CGNSINF",1000,DEBUG);
 if (state !=0) {
   Serial.println("State  :"+state);
   Serial.println("Time  :"+timegps);
   Serial.println("Latitude  :"+latitude);
   Serial.println("Longitude  :"+longitude);

   sim808.print("AT+CMGS=\"");
   sim808.print(phone_no);
```

```
    sim808.println("\"");
    delay(300);
 sim808.print("http://maps.google.com/maps?q=loc:");
    sim808.print(latitude);
    sim808.print(",");
    sim808.print (longitude);
    delay(200);
    sim808.println((char)26); // End AT ommand with a ^Z, ASCII code 26
    delay(200);
    sim808.println();
    delay(20000);
    sim808.flush();
     } else {
    Serial.println("GPS Initialising...");
  }
}
void sendTabData(String command , const int timeout , boolean debug){
sim808.println(command);
 long int time = millis();
 int i = 0;
 while((time+timeout) > millis()){
   while(sim808.available()){
     char c = sim808.read();
     if (c != ',') {
       data[i] +=c;
       delay(100);
     } else {
       i++;
     }
     if (i == 5) {
```

```
          delay(100);

          goto exitL;

        }

      }

    }exitL:

    if (debug) {

      state = data[1];

      timegps = data[2];

      latitude = data[3];

      longitude =data[4];

    }

  }

  String sendData (String command , const int timeout ,boolean debug){

    String response = "";

    sim808.println(command);

    long int time = millis();

    int i = 0;


    while ( (time+timeout ) > millis()){

      while (sim808.available()){

        char c = sim808.read();

        response +=c;

      }

    }

    if (debug) {

      Serial.print(response);

      }

      return response;

  }
```

For GPS Info:

```
#include <SoftwareSerial.h>
#define DEBUG true


SoftwareSerial sim808(7,8);


void setup()
{
 Serial.begin(9600);
 sim808.begin(9600);
}


void loop()
{
  getgps();
  while(1)
  {
     sendData( "AT+CGNSINF",1000,DEBUG);
     delay(1000);


  }


}
void getgps(void)
{
  sendData( "AT+CGNSPWR=1",1000,DEBUG);
  sendData( "AT+CGNSSEQ=RMC",1000,DEBUG);
}
```

```
String sendData(String command, const int timeout, boolean debug)
{
    String response = "";
    sim808.println(command);
    long int time = millis();
    while( (time+timeout) > millis())
    {
      while(sim808.available())
      {
        char c = sim808.read();
        response+=c;
      }
    }
    if(debug)
    {
      Serial.print(response);
    }
    return response;
}
```

Conclusion: The use of geo location tracker has many different functions. It can be used for presenting ads, relevant content, promotion or coupons. The best thing about this geo location data for mobile marketing is that it creates more tailored and relevant marketing for potential customers. This features can be used in cars to track them and trace their location.

Sources:

1.Wikipedia

2. https://www.youtube.com/watch?v=qQnjlwf-8yQ