**IoT Course Project**

**Vehicle Tracking Device**

*By ET-B, Batch 3, Group 5*

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**Introduction:**

As we are heading towards modern technology in daily use, IoT has been playing a major vital role in it. Vehicle Tracking Device is such a device that tracks gps location of a vehicle in which it is mounted in. It has 2 main hardware components are NodeMCU ESP8266 and NEO 6M GPS module. Nodemcu acts as the brain of the device and must have wifi connectivity in order to display results on phone. Neo 6M gps is a sensor module that detects its own location. Another major component of device is blynk android app wherein we will get results.

The project is an attempt at providing one more advantage to humanity with help of Internet of Things.

**Components Used:**

1. NodeMCU ESP8266
2. Neo 6M GPS
3. Jumper wires
4. Blynk android app
5. Arduino IDE
6. 5V power supply for NodeMCU

**Connections:**

GPS Module ESP8266

VCC - 3.3V

GND - GND

RX - D1

TX - D2

**Working:**

Vehicle Tracking Device is a simple device. Some important libraries are imported in the code for esp8266 to process data from gps module. The gps module sends encoded data to esp8266 through RX and TX pins. The data provided by the gps module is then processed and decoded in the nodemcu. A project is created in blynk app using labels. Then the data is transferred from nodemcu to the blynk app project using wifi connectivity to nodemcu. The data then is displayed on blynk app project in labels.

When the connections are not correct then a message is displayed on serial monitor as well as on blynk project that says, “No GPS detected. Check wiring.”. This is checked via charsProcessed function of one of the libraries included.

**Libraries used:**

1. **TinyGPS++**

Used to get functions that can easily decode the data provided by gps module. Object is created and then functions are used to get details such as latitude, longitude and speed of the gps module is detected.

1. **ESP8266WiFi**

Used to provide and get functions needed to ensure wifi connectivity to the nodemcu. Wifi hotspot name and password to it is provided in code. It is then given to a function from this library, if in range of that hotspot the nodemcu gets connected to it.

1. **BlynkSimpleEsp8266**

This library is used to ensure connectivity and ease of handling between the device and the blynk project. With the use of this library functions we can display values on blynk project on phone. virtualWrite function is used for that.

For project authorisation important details such as template ID, device name, authorisation token are provided in code.

1. **SoftwareSerial**

It is used to ensure serial connection to the gps module using RXPin and TXPin. Object constructor of this class accepts these pin numbers as its parameters. “.available” and “.read” are some functions used to check and read encoded data.

**Output:**

Serial Monitor:-

Graphical user interface, application

Description automatically generated

Blynk app project:-

Background pattern

Description automatically generated with low confidence

Background pattern

Description automatically generated with low confidence

**Results and Discussions:**

The NEO 6M GPS module is used to detect the location of the device. And with the help of libraries latitude, longitude and speed of the device is detected and then is displayed in blynk app project. The results obtained met the expectations as the vehicle in which the device was installed could be tracked remotely with blynk app. Many different readings were taken after changing location and speed, and then verified the readings and location in order to calculate error. The error calculated was minimal.

**Conclusion:**

The device can be used for tracking a vehicle for keeping record of travel. One can also use it for surveillance of the vehicle. The device can prove to be very useful at a time of emergency wherein it could be stolen. With help of this device the vehicle can be tracked to whatever location the thief takes it to.