**4.1 Introduction**

**4.2 Implementaion**

When the hardware is ready according to the given circuit diagram and after programming it, it can be installed in vehicle and power it up. The user just need to send a SMS, “Track Vehicle”, to the system that is placed in vehicle. Sent message is received by GSM module which is connected to the system and sends message data to Arduino. Arduino reads it and extract main message from the whole message. And then compare it with predefined message in Arduino. If any match occurs then Arduino reads coordinates by extracting $GPGGA String from GPS module data and send it to user by using GSM module. This message contains the coordinates of vehicle location.

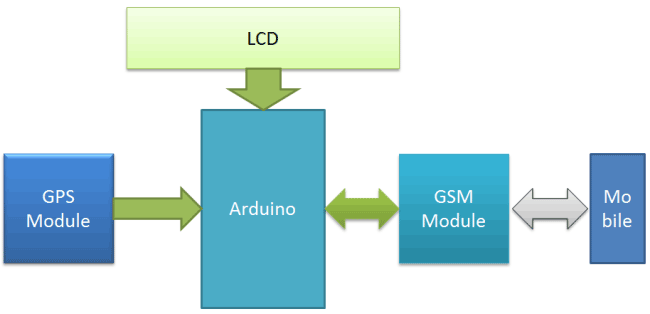


Fig 4.1: System Flow

As soon as the Arduino is powered up, a message will be sent to user using the GSM module regarding the starting of vehicle and to track the vehicle or not. According to user choice further decision will be made by Arduino. If the user chooses to track the vehicle GPS module will track the vehicle and will send the live coordinates of vehicle to the user with a message to stop the car at that coordinate. If the user chooses to stop the car then the Arduino will cut-off the power supply to engine and thus the car will stop there.

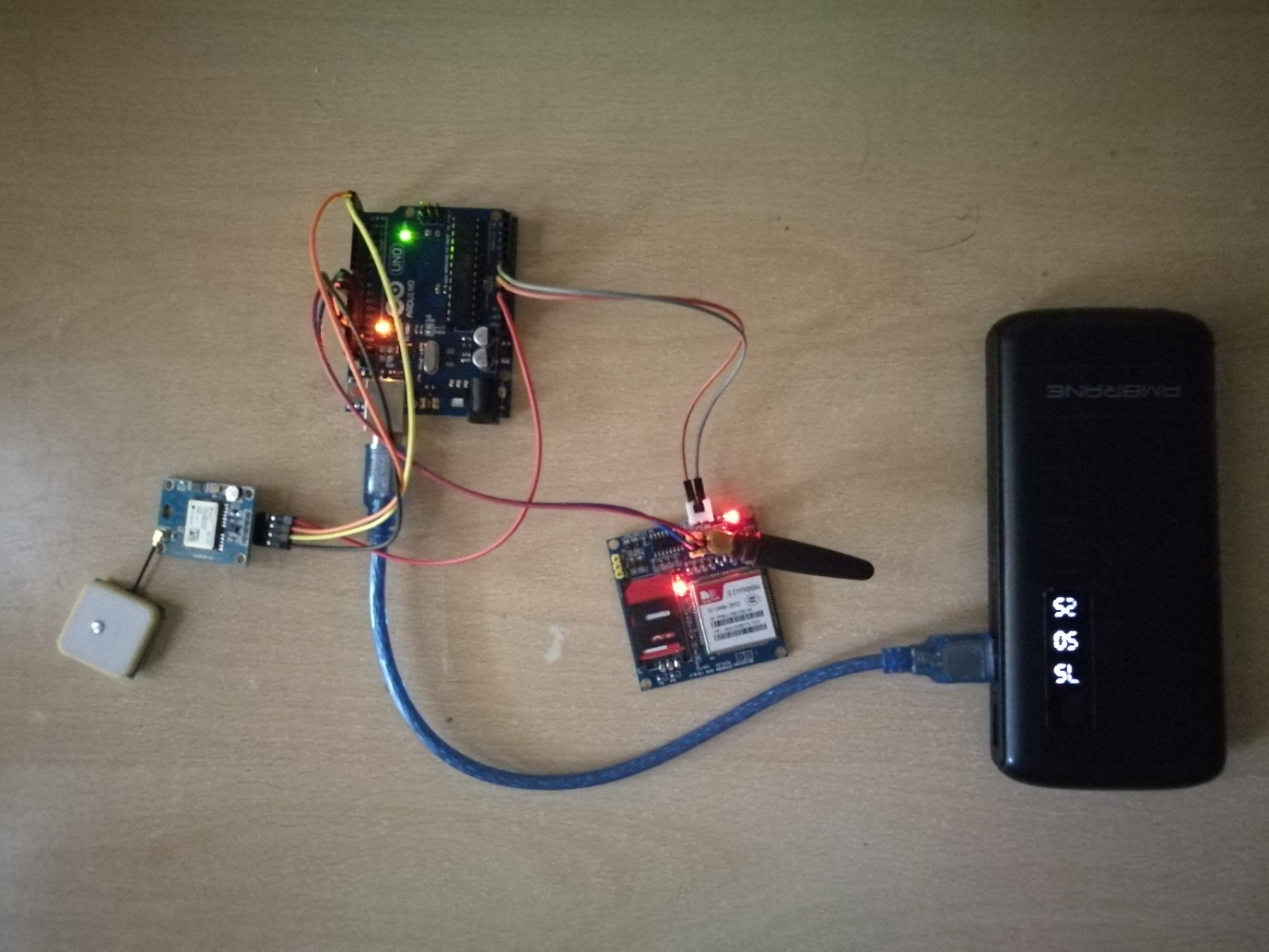
Following is the live working of the project. The Arduino is powered by a 5V Power Source that is coming from a power bank. GPS Modules and GSM Module are interfaced with Arduino by Jumper cables (male and female), while Arduino is connected to the power bank by a USB Cable.

Fig. 4.2: Live Project

**4.3 Output**

Output of GPS module is given if Fig 4.1

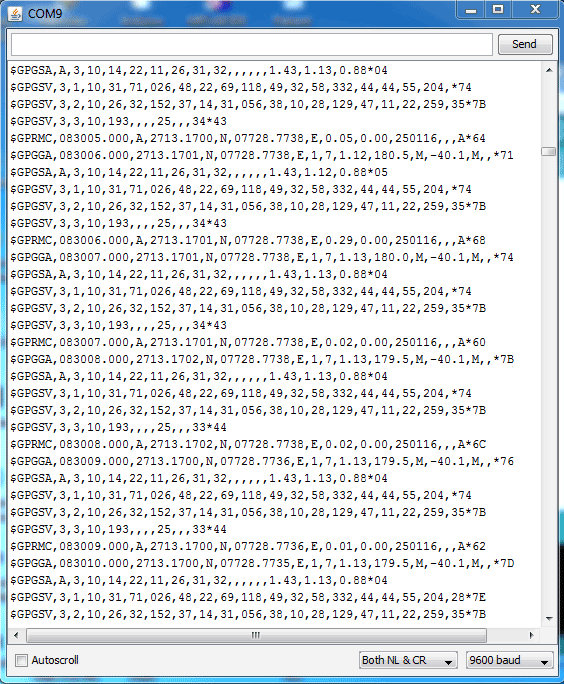
z

Fig 4.1

Below is the $GPGGA String, along with its description:

**$GPGGA,104534.000,7791.0381,N,06727.4434,E,1,08,0.9,510.4,M,43.9,M,,\*47**

$GPGGA,HHMMSS.SSS,latitude,N,longitude,E,FQ,NOS,HDP,altitude,M,height,M,,checksum data.

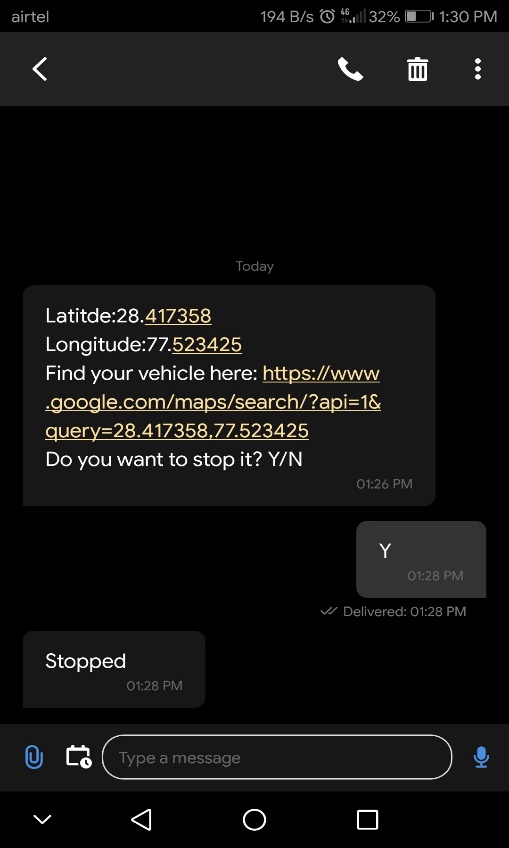


Fig 4.2

As shown in Fig 4.2, the conversation between Arduino and user will look like this. Arduino will send a live link to track vehicle via GSM module. This link can directly be open in Google Maps.

**4.4 Conclusion**

This system can be used for both personal and business purposes to improve safety and security, communication, and performance monitoring. Vehicle theft detection systems have become increasingly important in large cities and are more secured than many other systems. Nowadays, vehicle theft is rapidly increasing. With this technology however, vehicle theft can be better controlled. This technology can also help to advance transportation systems, and can be used in many organizations for security and tracking purposes. Also, the proposed system is more useful, as a result of the addition of different types of sensors which help to protect the owner and other users of the vehicle by reducing the possibility of collisions. In the event of an accident, the system will send the location to designated numbers so assistance can be provided as soon as possible. This will be particularly useful in instances where accidents occur in deserted places and midnights. In the future, this vehicle tracking and accident alert feature will play an important role in day-to-day life.