ARYA COLLEGE OF ENGINEERING & I.T.
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Estd. Yr. 2000 | ARYA 1st Old Campus | REAP CODE 14

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ELECTRONICS & COMMUNICATION ENGINEERING

PROJECT PRESENTATION ON TRACK-MATE

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4th year, ECE

INTRODUCTION:

Motivation:

In an era marked by the ever-accelerating pace of technological advancements and an increasing emphasis on safety, the "Track-Mate" project has emerged as a compelling and innovative solution to address critical challenges in the realm of rider safety and connectivity. With an unwavering commitment to enhancing the well-being of motorcycle and bicycle riders, we find our motivation in reducing the risks associated with two-wheeled transportation and fostering a sense of security that empowers riders on the road.

Broad Area and Problem:

The broad area of concern that this project addresses lies at the intersection of technology and road safety. Motorcycle and bicycle riders often face vulnerabilities due to limited protection, and in the event of an accident, timely assistance can be a matter of life or death. The problem we aim to solve is the need for a comprehensive safety system that not only tracks the real-time location of riders but also monitors their speed and detects accidents immediately. This project seeks to mitigate these inherent risks and provide riders with an added layer of protection on their journeys.

Roles & Responsiblities:

Faisal Sohail: Hardware & Software works

Priya Singh: Documentation

Aishwarya Srivastava: Testing

Abhay Singh Shekhawat: Desinging

Himanshu Bharti: Research

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Components List:

S. No.	Component Name
1.	NodeMCU ESP8266
2.	Ublox NEO-6M GPS Module
4.	GSM SIM900A
5.	Gyroscope MPU6050
6.	Power Supply
7.	Charging module

SCOPE & RQUIREMENTS

1. **Smart Helmet Functionality:** The project aims to develop a smart helmet with integrated GSM and GPS technologies to enhance rider safety and connectivity.

2. **Real-Time Location Tracking:** The helmet will continuously record GPS coordinates and transmit them to a connected mobile application, enabling real-time location tracking of the rider.

3. **Speed Monitoring:** The system will monitor the rider's speed and display it on the mobile app, encouraging safe and responsible riding habits.

4. **Self Dependent Device:** This helmet is made for everyone's use so it don't need mobile phone to connect with. It only requires continuous power source.

5. **Accident Detection:** In the event of an accident, the helmet's sensors will detect the impact, triggering an emergency alert. The mobile app will send the accident location to predefined emergency contacts.

6. **Safety Features:** The system will prioritize rider safety by providing an automatic emergency response mechanism, including accident alerts, SOS messages, and live location sharing.

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APPLICATION:

- ➢ Real-time tracking
- ➢ Accident detection
- ➢ Speed and distance monitoring
- ➢ Safety and Protection
- ➢ Motorcycle Riding
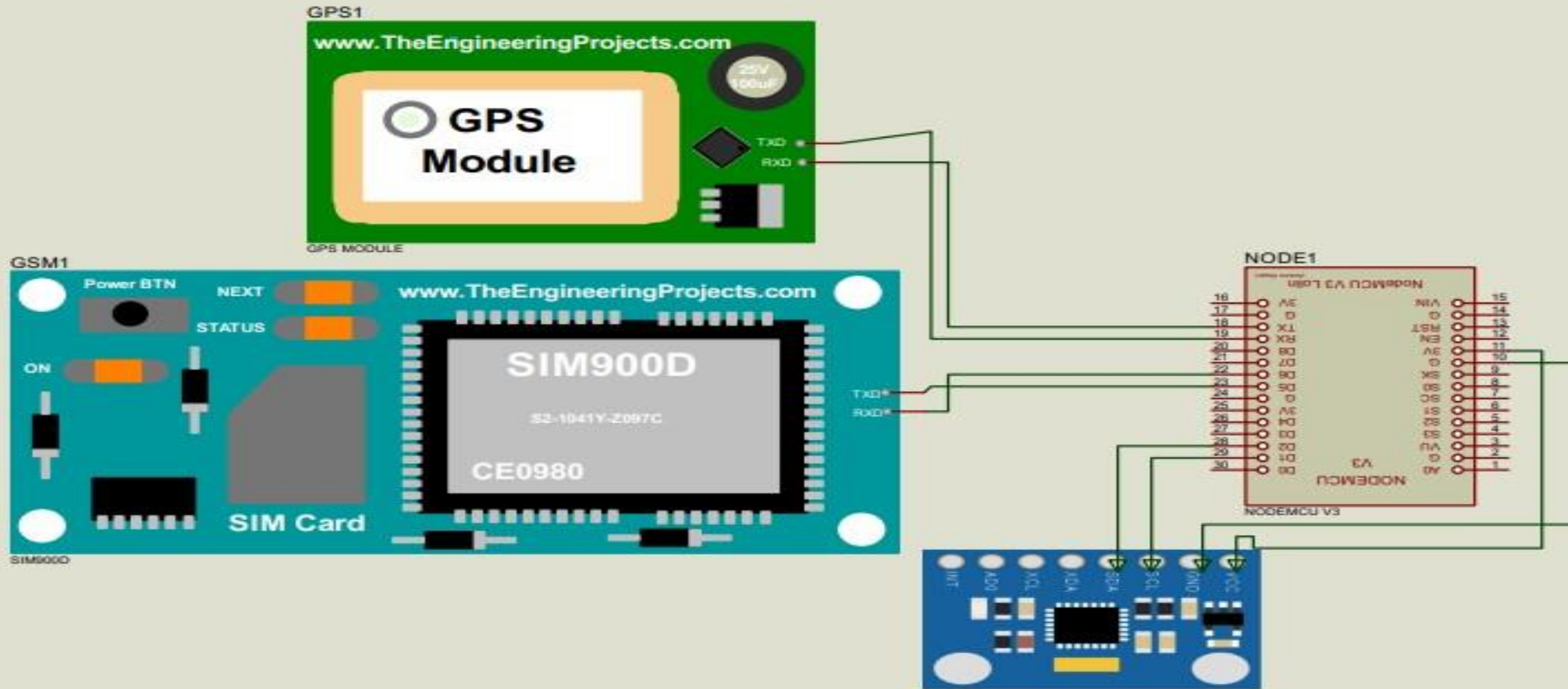- ➢ Cycling
- ➢ Can be used in construction and Industrial Work

DEPENDENCIES:

- **Hardware maintenance:** This helmet need maintenance after a fixed time so that it can work properly without any glitch.

- **Mobile network:** Due to mobile network or jammers, the helmet can't work properly as it doesn't send message without network.

- **Weather:** Due to bad whether mobile network and GPS may not work and it cause some loss to the user.

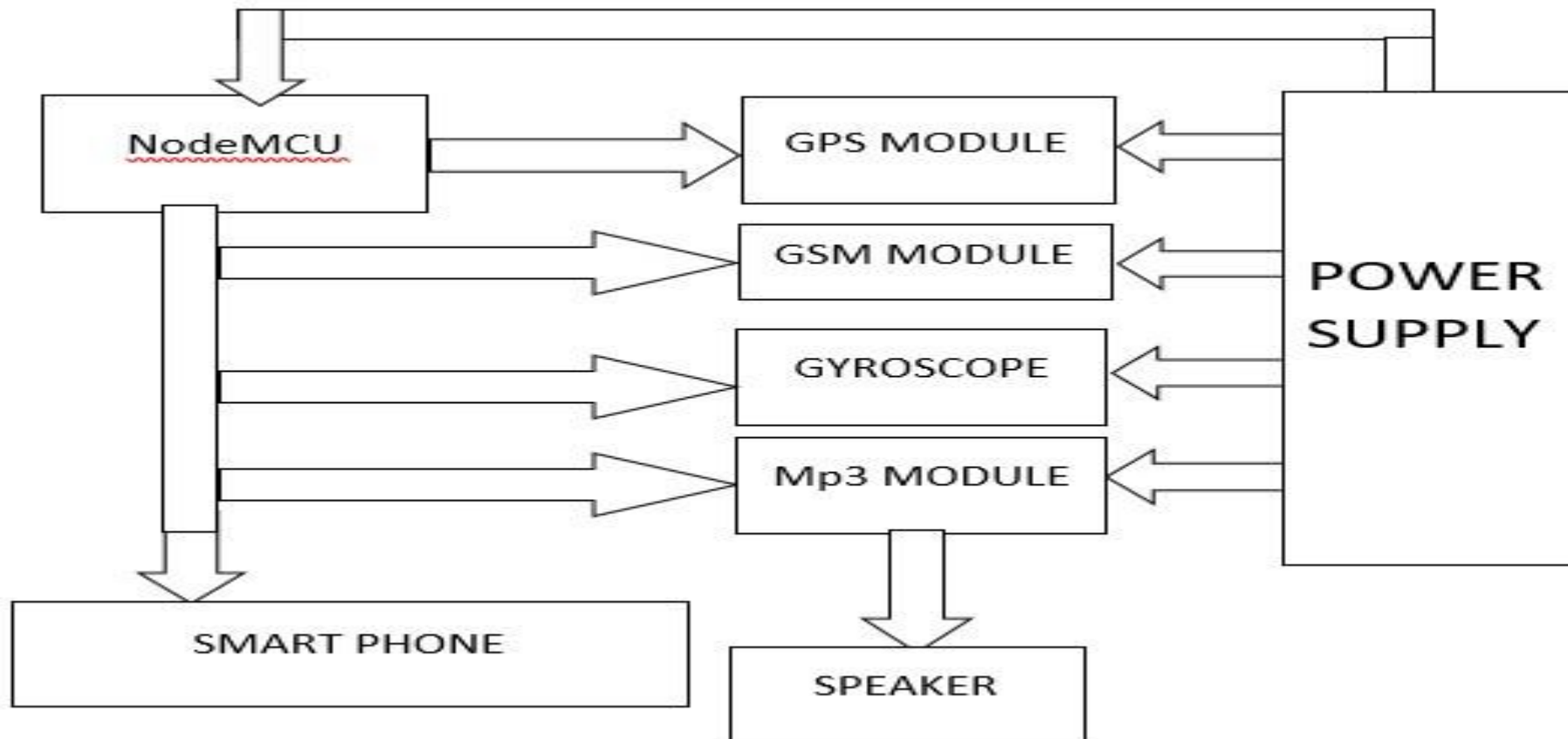- **Continuous power supply:** This circuit need continuous power supply so that it can work properly.

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CIRCUIT:

BLOCK DIAGRAM

REFERENCES

1. P Koteswara Rao's Design And Implementation Of Smart Helmet Using IoT at International Conference of Advance Research and Innovation (ICARI-2020).

2. S Sobhana1 , S R Sowmeeya's SMART HELMET ICCSSS 2020 IOP Conf. Series: Materials Science and Engineering 1084 (2021) 012116 IOP Publishing doi:10.1088/1757-899X/1084/1/012116.

3. J Joy Mathavan's Smart helmet to start the motorbike and to prevent accidents ICMSMT-2022 IOP Conf. Series: Materials Science and Engineering 1258 (2022) 012051 IOP Publishing doi:10.1088/1757-899X/1258/1/012051.

4. Keesari Shravya's Smart helmet for safe driving E3S Web of Conferences 87, 010023 (2019).

5. Dhawal Khangar's Smart Helmet Using GSM Module and Ardiuno published at International Journal for Research in Applied Science & Engineering Technology (IJRASET) ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538 Volume 11 Issue VI Jun 2023.

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<u>Literature Review</u>

We have included research papers from 2018 to 2023 of publishers E3S Web of Conferences, **IRJET** (International IOT, Electronics and Mechatronics Conference, International Journal of Advanced Research in Science, Communication and Technology (**IJARSCT**), International Journal of Advances in Engineering and Management, Asian Journal of Applied Science and Technology (**AJAST**), International Journal of Creative Research Thoughts (**IJCRT**), International Journal of Innovative Research in Computer Science & Technology (**IJIRCST**), **HBRP Publication** and International Research Journal of Modernization in Engineering Technology and Science the area of the review paper are Smart Helmet using IOT, GSM, GPS and Cloud technology.

Initialize

Serial Monitor


```
COM7

11:01:08.215 -> ʃʃʃʃʃʃʃʃʃʃʃʃʃʃʃʃʃʃʃʃʃʃʃʃʃʃʃʃʃʃʃʃʃʃ(H42.)Location configuring....
11:01:08.299 -> 43.)Location configuring.............................
11:01:08.346 -> 44.)Location configuring.............................
11:01:08.440 -> 45.)Location configuring.............................
11:01:08.486 -> 46.)Location configuring.............................
11:01:08.580 -> 47.)Location configuring.............................
11:01:08.627 -> 48.)Location configuring.............................
11:01:08.721 -> 49.)Location configuring.............................
11:01:08.768 -> 50.)Location configuring.............................
11:01:08.814 -> Gps not locked! somthing went wrong to gps.
11:01:08.908 -> Please go outdoor for better connectivity.
11:01:15.841 ->
11:01:15.841 -> ========================================
11:01:15.841 -> Calculating gyro offsets
11:01:15.888 -> DO NOT MOVE MPU6050...
11:01:19.379 -> Done!
11:01:19.379 -> X : 1.04
11:01:19.379 -> Y : 4.31
11:01:19.379 -> Z : -1.73
11:01:19.426 -> Program will start after 3 seconds
11:01:19.473 -> ========================================
11:01:24.629 -> Setup completed
11:01:24.629 -> -1
11:01:25.744 -> Messege = ʃʃ
11:01:25.744 -> Command =
11:01:25.744 -> -1
11:01:25.744 -> -1
11:01:25.778 -> -1
11:01:25.778 -> -1

☐ Autoscroll  ☑ Show timestamp
```

Phone

4:05

Track-Mate
+91 70801 74899   India

RIDER IS READY TO GO.

Current location:
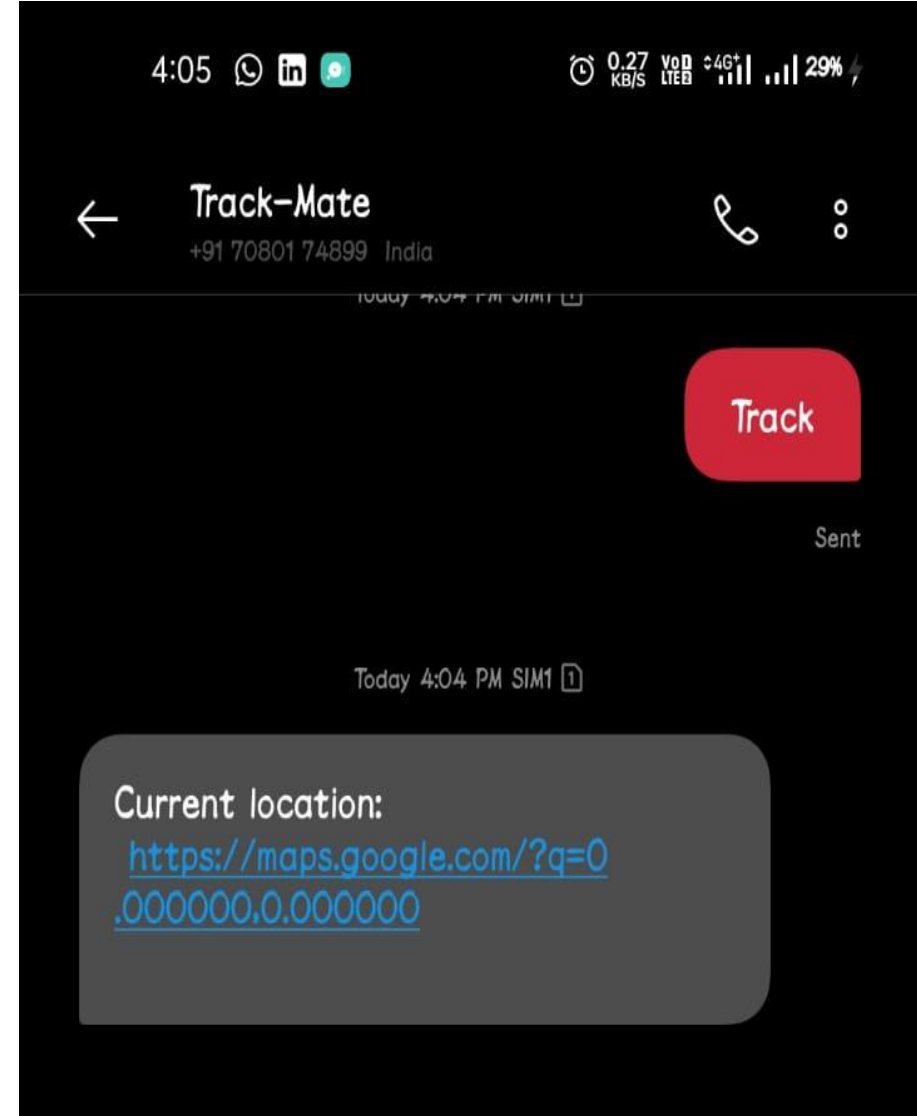https://maps.google.com/?q=0
.000000,0.000000
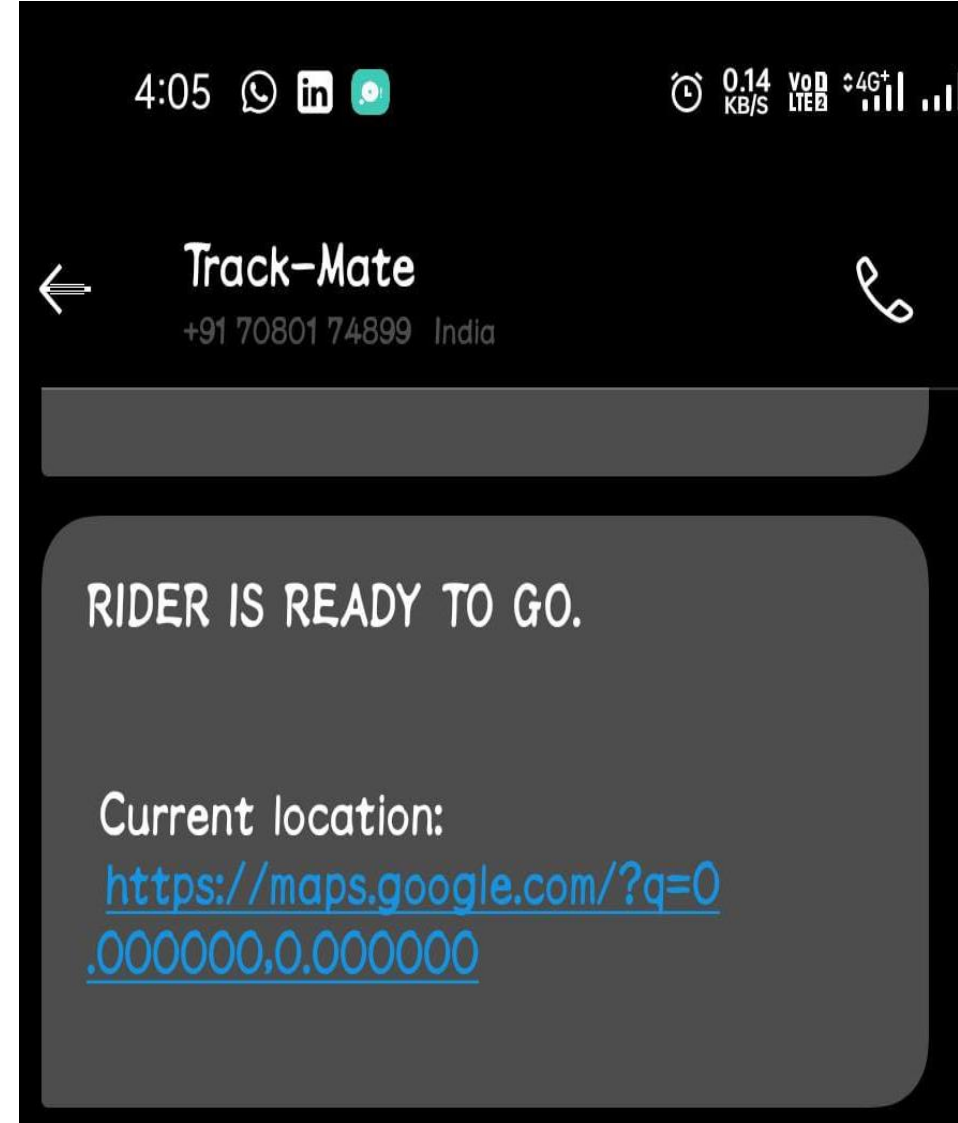
Track

Serial Monitor


```
COM7

16:04:44.497 -> 0
16:04:44.497 -> 0
16:04:44.497 -> 0
16:04:44.497 -> 0
16:04:44.497 -> 0
16:04:44.497 -> 0
16:04:44.497 -> 0
16:04:44.497 -> 0
16:04:44.497 -> 0
16:04:44.497 -> 0
16:04:44.497 -> 0
16:04:44.497 -> 0
16:04:44.544 -> 0
16:04:44.544 -> 0
16:04:44.544 -> 0
16:04:44.544 -> 0
16:04:44.544 -> 0
16:04:44.544 -> 0
16:04:44.544 -> 0
16:04:44.544 -> 0
16:04:45.481 -> Messege =
16:04:45.481 -> +CMT: "+918340440537","","24/04/02,16:04:42+22"
16:04:45.528 -> Track
16:04:45.575 ->
16:04:45.575 -> Command = track
16:04:47.012 -> OK
16:04:48.558 -> Done
16:04:48.558 -> 0
16:04:49.589 -> Messege = AT+CMGS="+918340440537"
16:04:49.636 ->
16:04:49.636 -> > Current location:
16:04:49.636 ->   https://maps.go
16:04:49.683 -> Command = tps://maps.
16:04:49.683 -> 0
16:04:49.683 -> 0
16:04:49.683 -> 0
16:04:49.683 -> 0
16:04:49.683 -> 0

[ ] Autoscroll  [✓] Show timestamp
```

Phone

4:05

Track-Mate
+91 70801 74899 India

Today 4:04 PM SIM1

Track

Sent

Today 4:04 PM SIM1

Current location:
https://maps.google.com/?q=0
.000000,0.000000

Working of Gyroscope

Serial Monitor
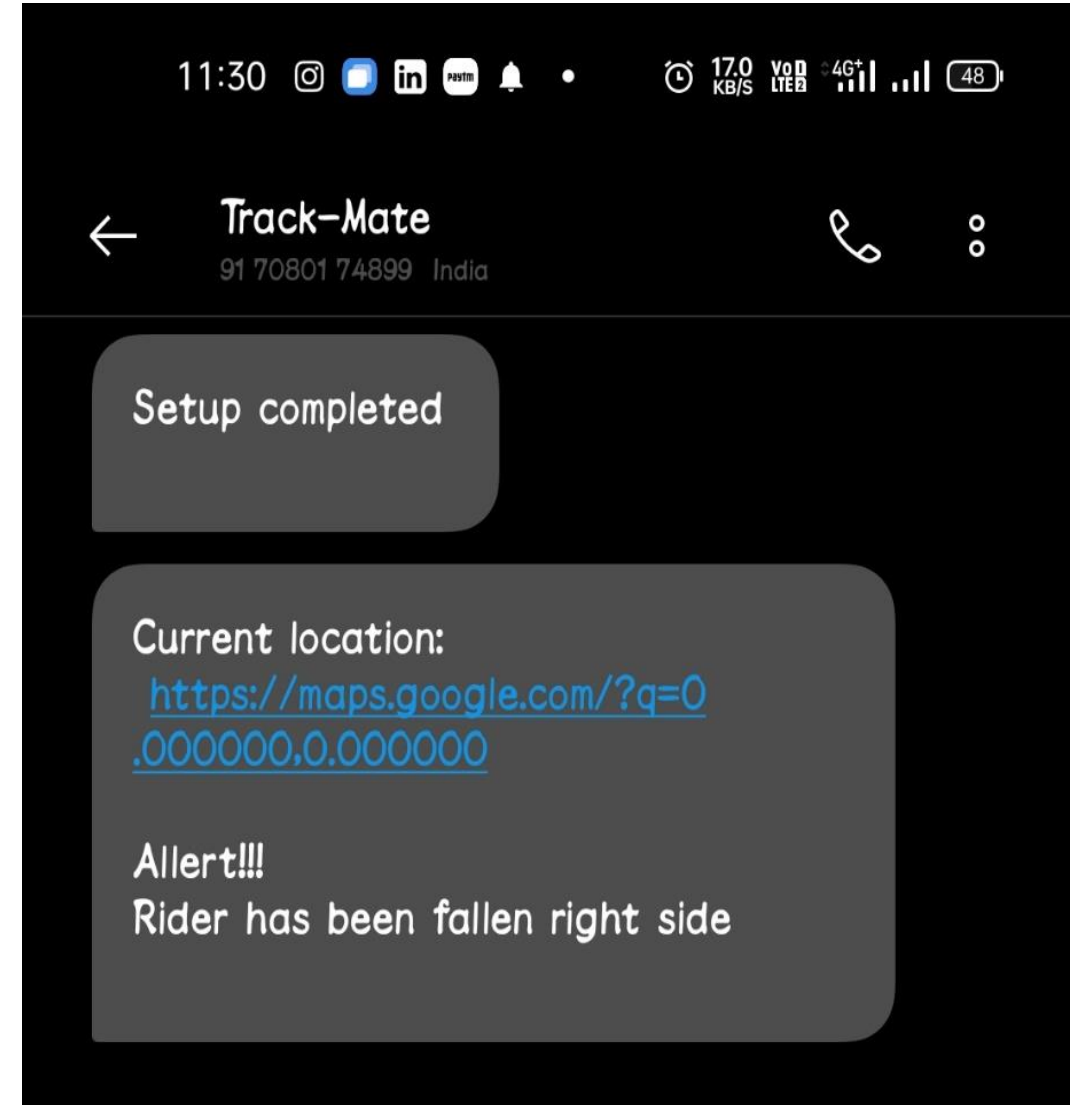

Phone

Working of Gyroscope

Serial Monitor

COM7

```
11:06:22.832 -> -68
11:06:22.832 -> -68
11:06:22.832 -> -68
11:06:22.832 -> -68
11:06:22.832 -> -68
11:06:22.832 -> -69
11:06:22.869 -> -69
11:06:22.869 -> -69
11:06:22.869 -> -69
11:06:22.869 -> -69
11:06:22.869 -> -69
11:06:22.869 -> -69
11:06:22.916 -> -69
11:06:22.916 -> -69
11:06:22.916 -> -70
11:06:22.916 -> -70
11:06:22.916 -> -70
11:06:22.916 -> -70
11:06:22.916 -> -70
11:06:22.916 -> -70
11:06:22.916 -> -70
11:06:22.916 -> -70
11:06:22.916 -> -70
11:06:22.916 -> -71
11:06:22.916 -> Side = R
11:06:24.349 -> Allert!!!
11:06:24.349 -> Rider has been fallen right side
11:06:25.968 -> -15
11:06:25.968 -> -9
```

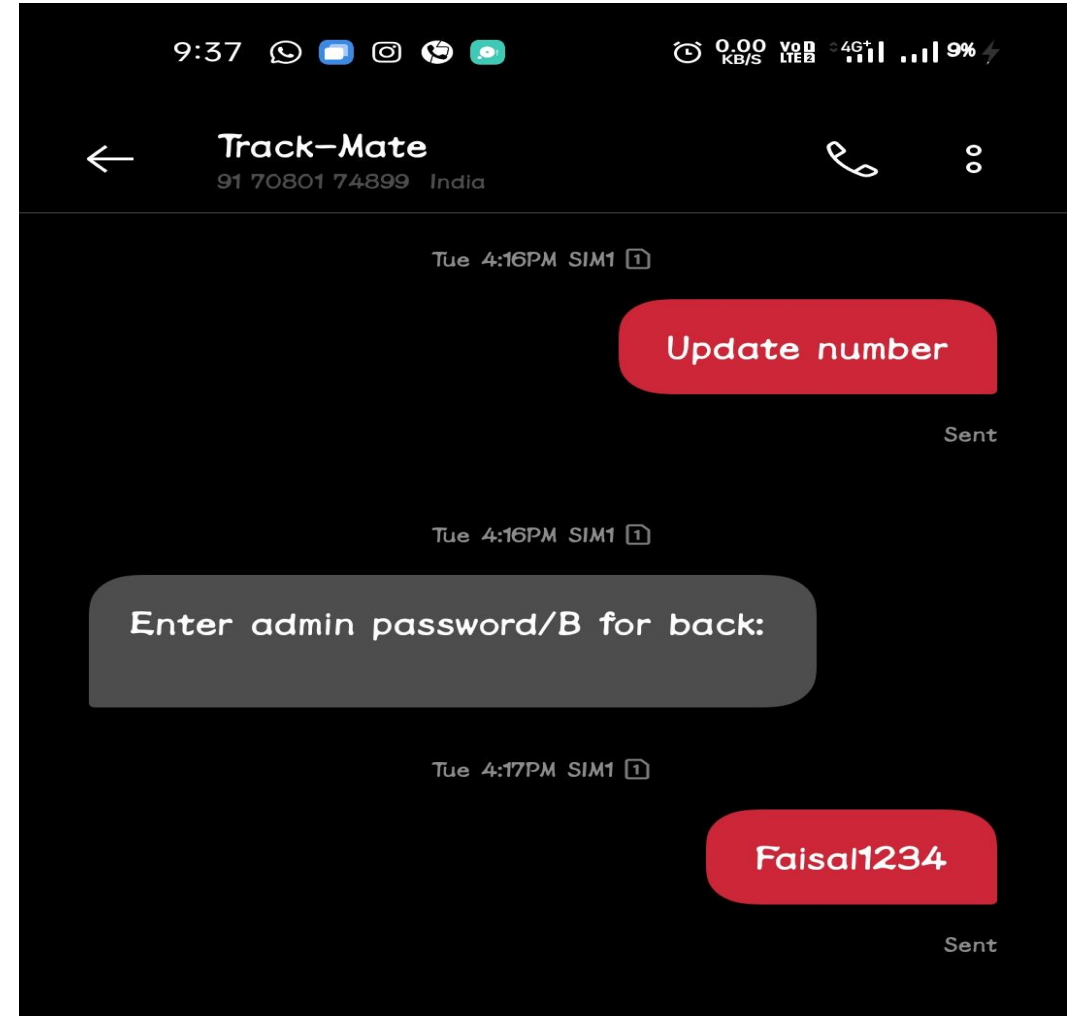☐ Autoscroll ☑ Show timestamp

Phone

Update Number

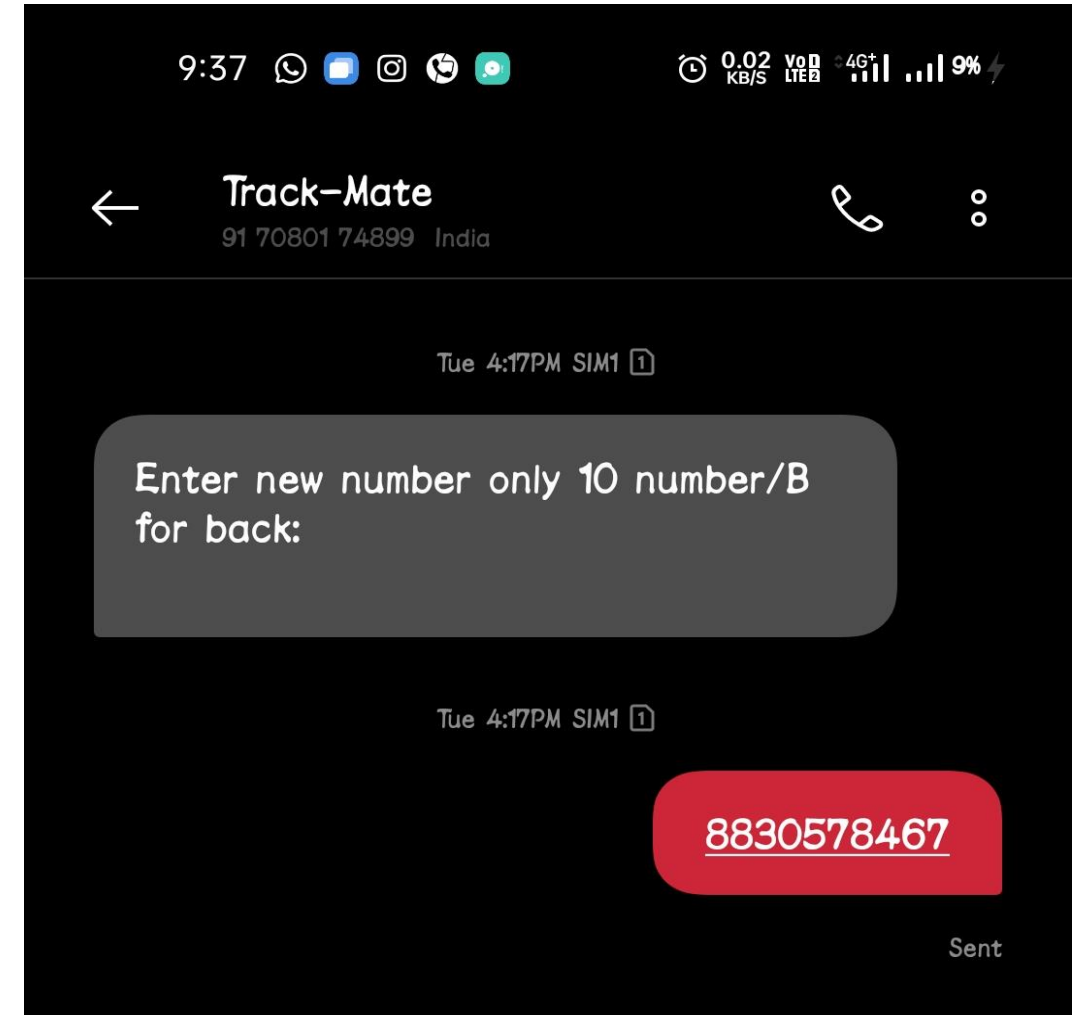## Serial Monitor

Phone

Update Number 2

Serial Monitor

Phone

COM7

16:17:26.638 ->
16:17:26.638 -> Command = Faisal1234
16:17:29.628 -> Enter new number only 10 number/B for back:

Track-Mate
91 70801 74899 India

Tue 4:17PM SIM1

Enter new number only 10 number/B for back:

Tue 4:17PM SIM1

8830578467

Sent

Update Password

Serial Monitor

COM7

```
16:07:14.564 -> 0
16:07:14.564 -> 0
16:07:14.564 -> 0
16:07:14.564 -> 0
16:07:14.564 -> 0
16:07:14.564 -> 0
16:07:14.611 -> 0
16:07:14.611 -> 0
16:07:14.611 -> 0
16:07:14.611 -> 0
16:07:14.611 -> 0
16:07:14.611 -> 0
16:07:14.611 -> 0
16:07:14.611 -> 0
16:07:14.611 -> 0
16:07:14.611 -> 0
16:07:14.611 -> 0
16:07:14.611 -> 0
16:07:14.611 -> 0
16:07:14.611 -> 0
16:07:14.611 -> 0
16:07:14.611 -> 0
16:07:15.595 -> Messege =
16:07:15.595 -> +CMT: "+918340440537","","24/04/02,16:07:11+22"
16:07:15.595 -> Update password
16:07:15.642 ->
16:07:15.642 -> Command = update password
16:07:18.628 -> Enter admin password/B for back:
16:07:19.659 -> AT+CMGS="+918340440537"
16:07:19.659 ->
16:07:19.659 -> > Enter admin password/B for back:
16:07:19.706 ->
16:07:19.706 -> Messege = AT+CMGS="+918340440537"
16:07:19.753 ->
16:07:19.753 -> > Enter admin password/B for back:
16:07:19.753 ->
16:07:19.753 -> Command = B for back:
16:07:21.145 ->
```

☐ Autoscroll ☑ Show timestamp

Phone
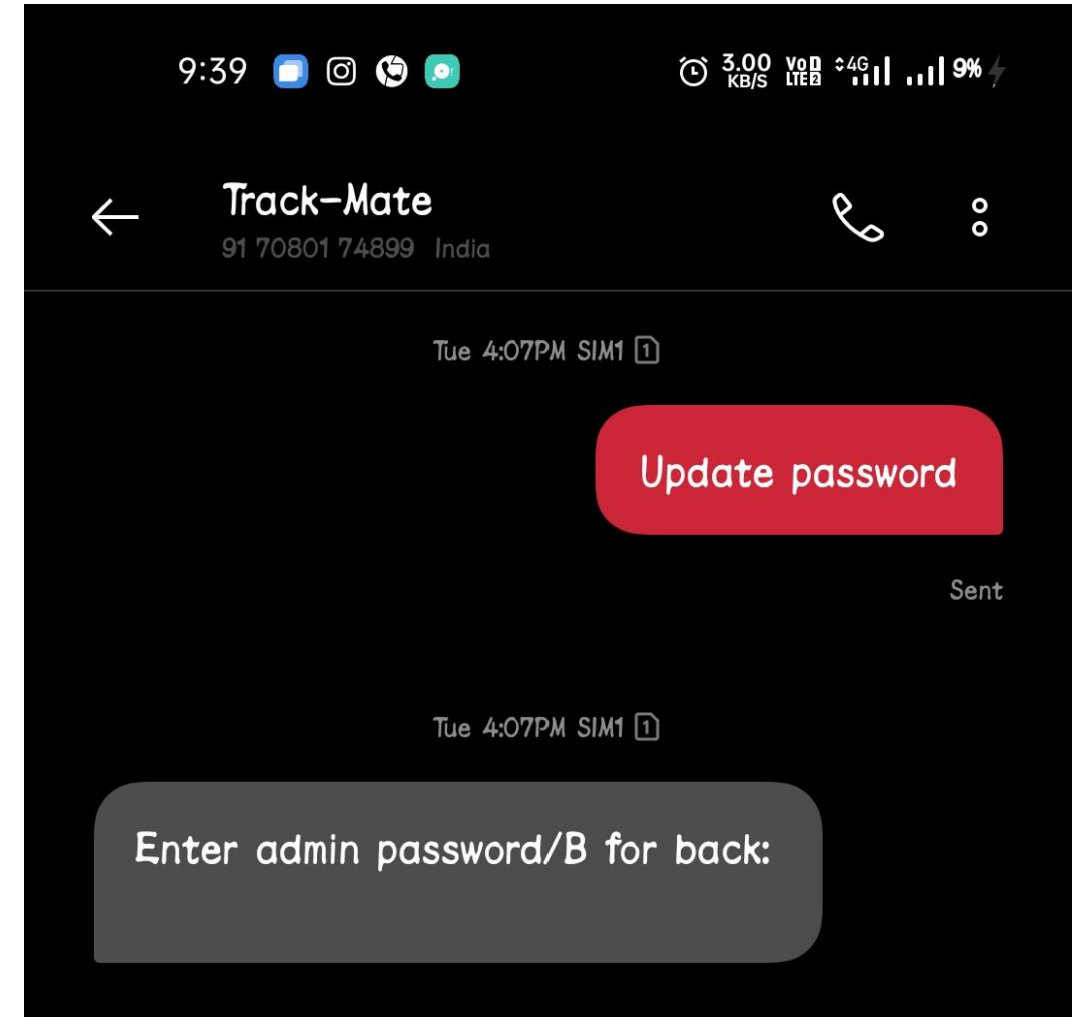
Update Password 2

Serial Monitor

```
16:08:40.321 ->
16:08:40.321 -> Messege =
16:08:40.368 -> +CMT: "+918340440537","","24/04/02,16:08:37+22"
16:08:40.415 -> aryaold
16:08:40.415 ->
16:08:40.415 -> Command = aryaold
16:08:43.414 -> Enter new password only 10 characters/B for back:
16:08:44.400 -> AT+CMGS="+918340440537"
16:08:44.400 ->
16:08:44.400 -> > Enter new password only 10 charact
16:08:44.494 -> Messege = AT+CMGS="+918340440537"
16:08:44.494 ->
16:08:44.494 -> > Enter new password only 10 charact
```
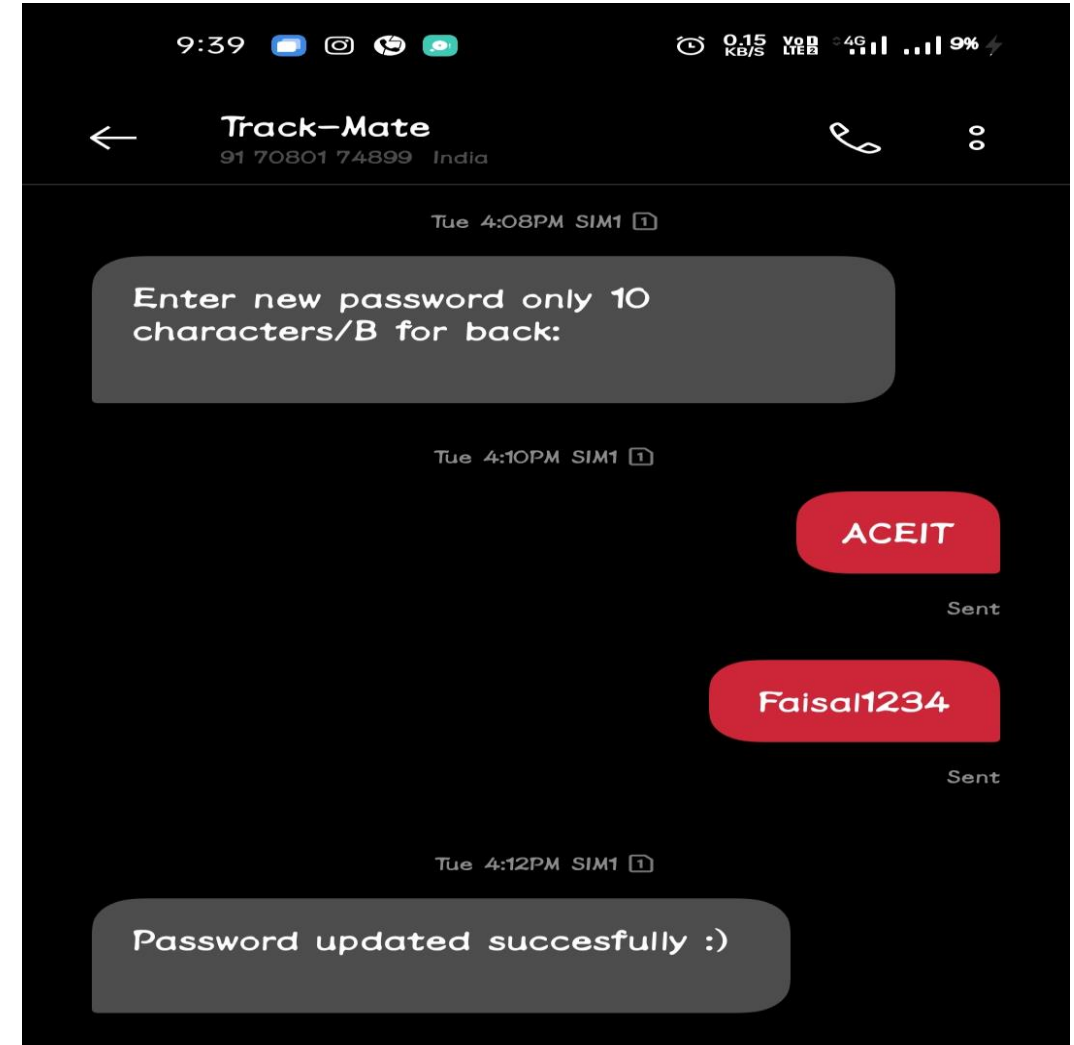
Phone
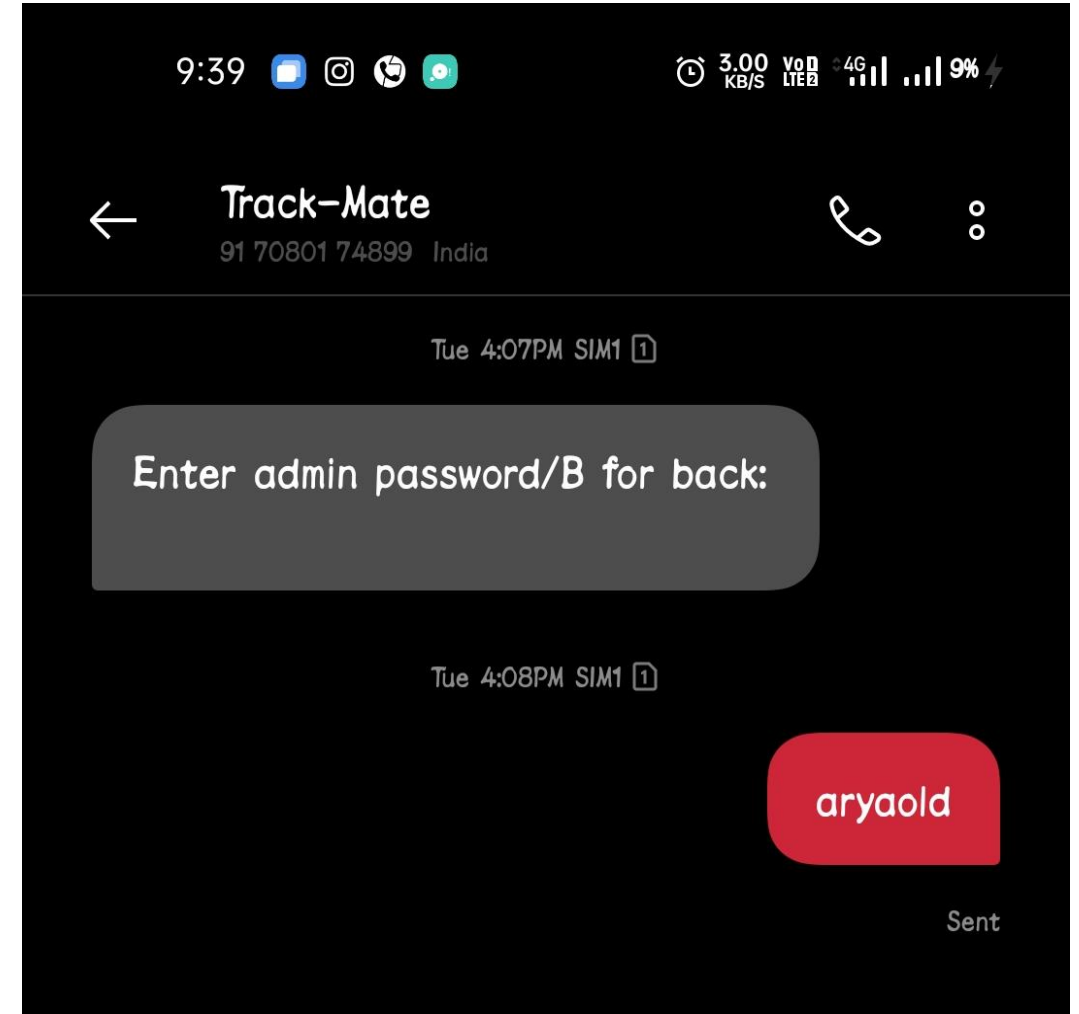
Update Password 3

Serial Monitor

```
16:10:42.566 -> Messege =
16:10:42.566 -> +CMT: "+918340440537","","24/04/02,16:10:38+22"
16:10:42.613 -> ACEIT
16:10:42.660 ->
16:10:42.660 -> Command = ACEIT
16:12:23.310 ->
16:12:23.310 -> +CMT: "+918340440537","","24/04/02,16:12:20+22"
16:12:23.357 -> Faisal1234
16:12:23.357 ->
16:12:23.404 -> Messege =
16:12:23.404 -> +CMT: "+918340440537","","24/04/02,16:12:20+22"
16:12:23.404 -> Faisal1234
16:12:23.451 ->
16:12:23.451 -> Command = Faisal1234
16:12:26.437 -> Faisal1234
16:12:26.437 -> Password updated succesfull :)
16:12:27.421 -> AT+CMGS="+918340440537"
16:12:27.421 ->
16:12:27.421 -> > Password updated succesfully :)
16:12:27.467 -> □
16:12:27.514 -> Messege = AT+CMGS="+918340440537"
16:12:27.514 ->
16:12:27.514 -> > Password updated succesfully :)
```

Phone

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CONCLUSION:

1. The Smart Helmet with GSM and GPS integration offers a practical solution to enhance rider safety.

2. It ensures real-time location tracking, speed monitoring, and automatic accident detection. By connecting the helmet to a mobile app, we aim to improve the overall riding experience while prioritizing rider safety.

3. This project underscores the potential for technology to address safety concerns and encourages further research and development in the field of smart wearables for enhanced safety in various applications.

THANK YOU

For your patience and attention