

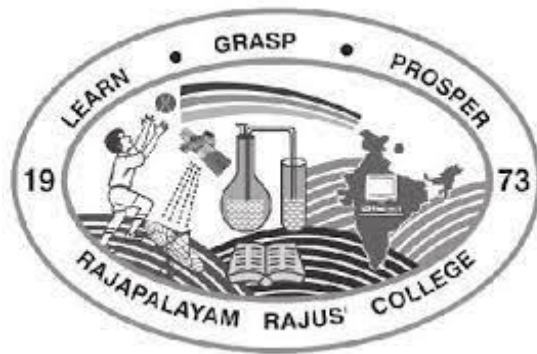


**Visualization Tool for Electric Vehicle Charge and
Range Analysis**
Project Based Experiential Learning Program

Mini project on
ELECTRIC VEHICLE:
VISUALIZATION TOOL FOR ELECTRIC VEHICLE
CHARGE AND RANGE ANALYSIS
BACHELOR OF SCIENCE

In
MATHEMATICS

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RAJAPALAYAM RAJU'S COLLEGE
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VISUALIZATION TOOL FOR ELECTRIC VEHICLE CHARGE AND RANGE ANALYSIS



1.Introduction:

1.1.Overview:

An **electric vehicle (EV)** is a [vehicle](#) that uses one or more [electric motors for propulsion](#). It can be powered by a [collector system](#), with [electricity](#) from extravehicular sources, or it can be powered autonomously by a [battery](#) (sometimes charged by [solar panels](#), or by converting [fuel](#) to electricity using [fuel cells](#) or a [generator](#)). EVs include, but are not limited to, road and [rail vehicles](#), surface and [underwater vessels](#), [electric aircraft](#), and [electric spacecraft](#). For road vehicles, together with other emerging automotive technologies such as autonomous driving, connected vehicles, and shared mobility, EVs form a future mobility vision called Connected, Autonomous, Shared, and Electric (CASE) Mobility.

EVs first came into existence in the late 19th century, when electricity was among the preferred methods for [motor vehicle](#) propulsion, providing a level of comfort and ease of operation that could not be achieved by the [gasoline cars](#) of the time. [Internal combustion engines](#) were the dominant propulsion method for [cars](#) and [trucks](#) for about 100 years, but electric power remained commonplace in other vehicle types, such as trains and smaller vehicles of all types.

[Government incentives to increase adoption](#) were first introduced in the late 2000s, including in the [United States](#) and the [European Union](#), leading to a growing market for vehicles in the 2010s. Increasing public interest and awareness and structural incentives, such as those being built into the [green recovery](#) from the [COVID-19 pandemic](#), are expected to greatly increase the electric vehicle market. During the [COVID-19 pandemic](#), lockdowns reduced the number of greenhouse gases in gasoline or diesel vehicles. The [International Energy Agency](#) said in 2021 that governments should do more to meet [climate goals](#), including policies for heavy electric vehicles. Electric vehicle sales may increase from 2% of the global [share](#) in 2016 to 30% by 2030. As of July 2022 the global EV market size was \$280 billion and was expected to grow to \$1 trillion by 2026. Much of this growth is expected in markets like North America, Europe, and China; a 2020 literature

review suggested that growth in the use of electric 4-wheeled vehicles appears economically unlikely in developing economies, but that electric 2-wheeler growth is likely. There are more 2 and 3 wheel EVs than any other types.

1.2.Purpose:

In this project we trying to analysis and compare the various Electric vehicle.

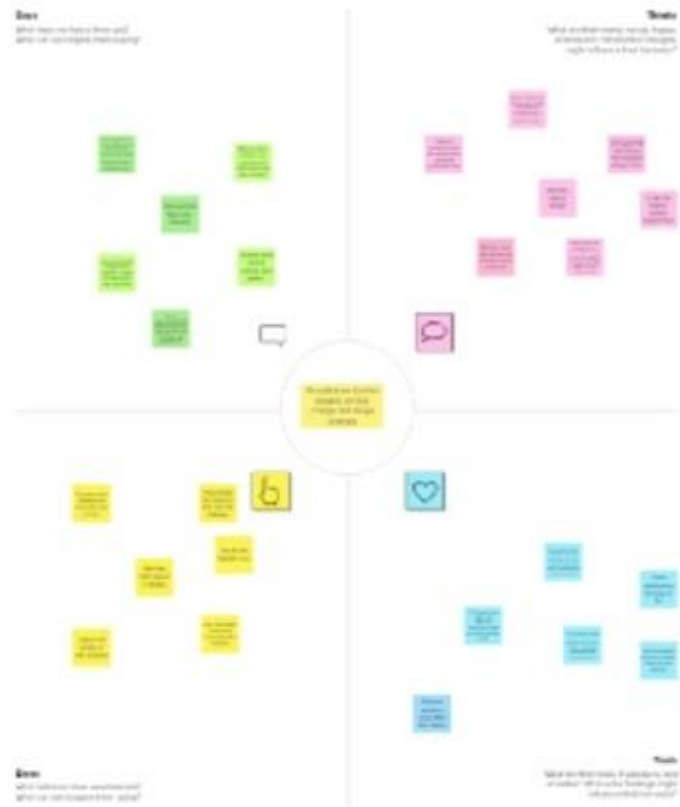
2.PROBLEM DEFINITION & DESIGN THINKING:

2.1. EMPATHY MAP:

Use this framework to develop a shared understanding and empathy for other people. An empathy map helps distill the core aspects of a user's experience, needs and pain points, to quickly understand your users' experience and mindset.

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The editor states you have been told not to clip together all of the information and that if you're doing that you won't.



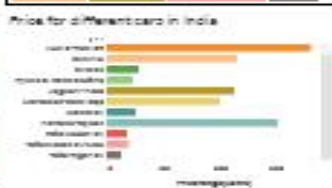
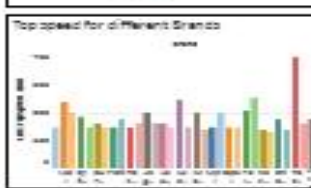
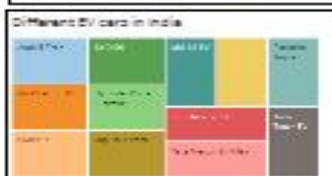
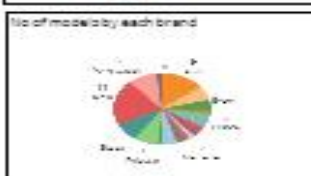
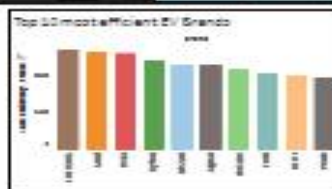
**Wanted: accurate
long-term data**
Long-term studies
in the treatment of
childhood depression
are needed.



2.2.IDEATION AND BRAINSTROMING :



3. RESULT:

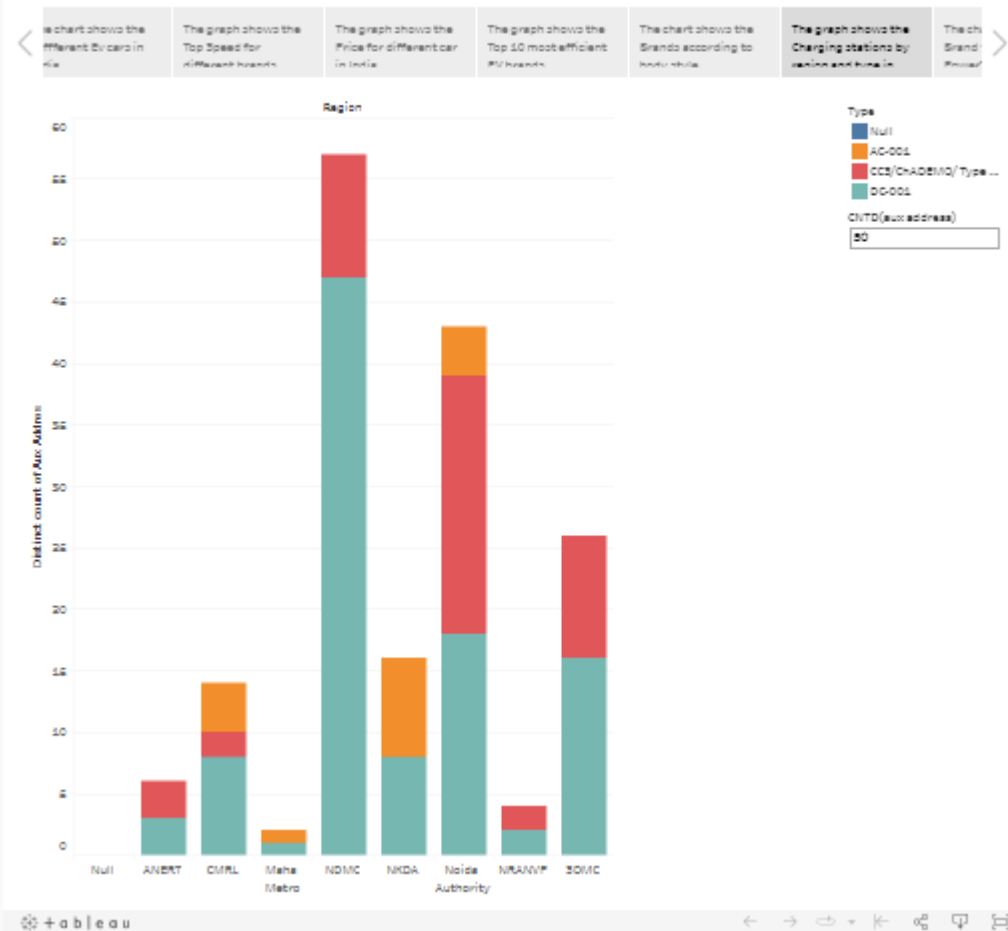


Electric Cars Analytic Dashboard



STORY

Story 1



3.1. ADVANTAGES:

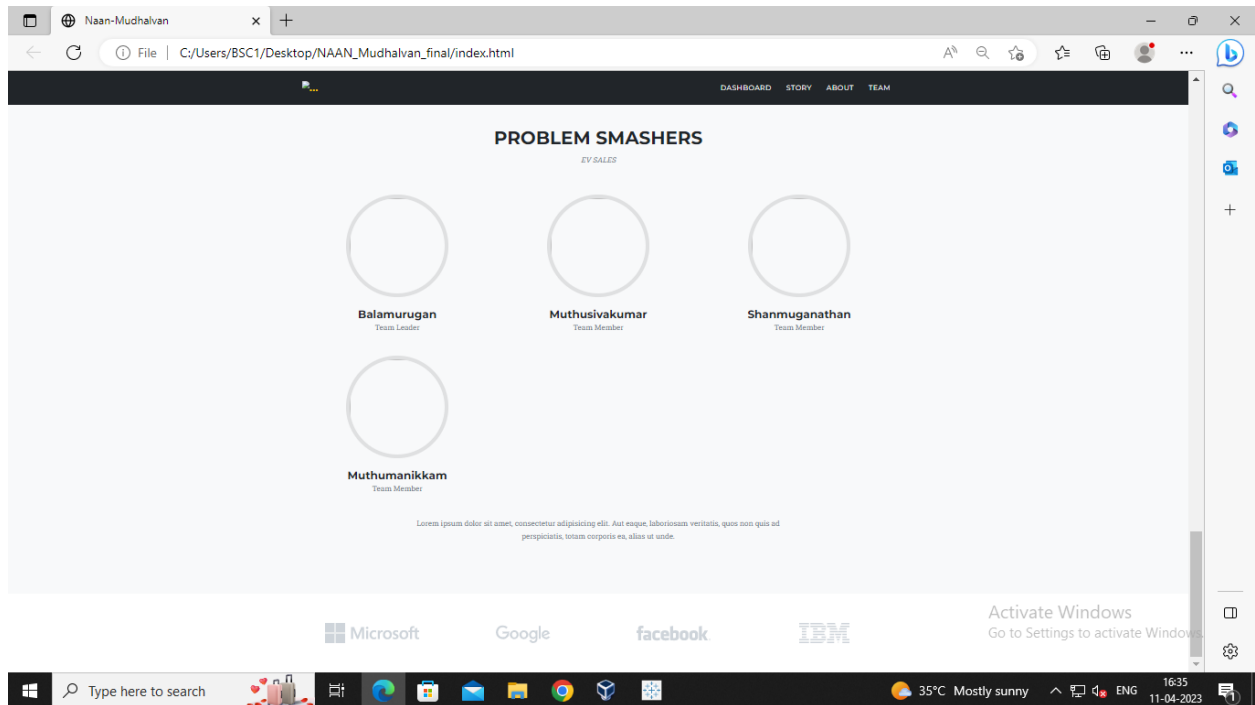
- Lower Running costs. Since you are not paying for petrol or diesel to keep your EV running, you save a lot of money on fuel.
- Low maintenance costs.
- Tax and financial benefits.

- Better performance.
- Zero tailpipe emissions.
- Easy to drive and quiet.
- Convenience of charging at home.
- No fuel, no emissions.

3.2. DISADVANTAGES:

- Limited Battery Range. The average petrol car can easily do four or five hundred miles on a tank of petrol.
- Battery lifespan concerns.
- Charging infrastructure worries.
- Long charging times.
- Low Top Speeds.
- More Expensive to buy.
- Environment Impact.

3.3.ABOUT:



4. APPLICATIONS:

- Electric vehicle use electricity to charge their batteries instead of using fossil fuels like petrol or diesel.
- EV are more efficient, and that combine with the electricity cost means that charging on EV is cheaper than filling petrol or diesel for your travel requirements.
- A Battery Management System (BMS) , which manages the electronics of a rechargeable battery , wheather a cell or a battery pack, thus becomes crucial factor in ensuring electric vehicle safety.
- Main applications are in wireless communication, power tools and mobile computing. This batteries are especially

suited for electrically or mechanically arduous applications such as generators starting, hybrid electric vehicle or starting aircrafts.

5. CONCLUSION:

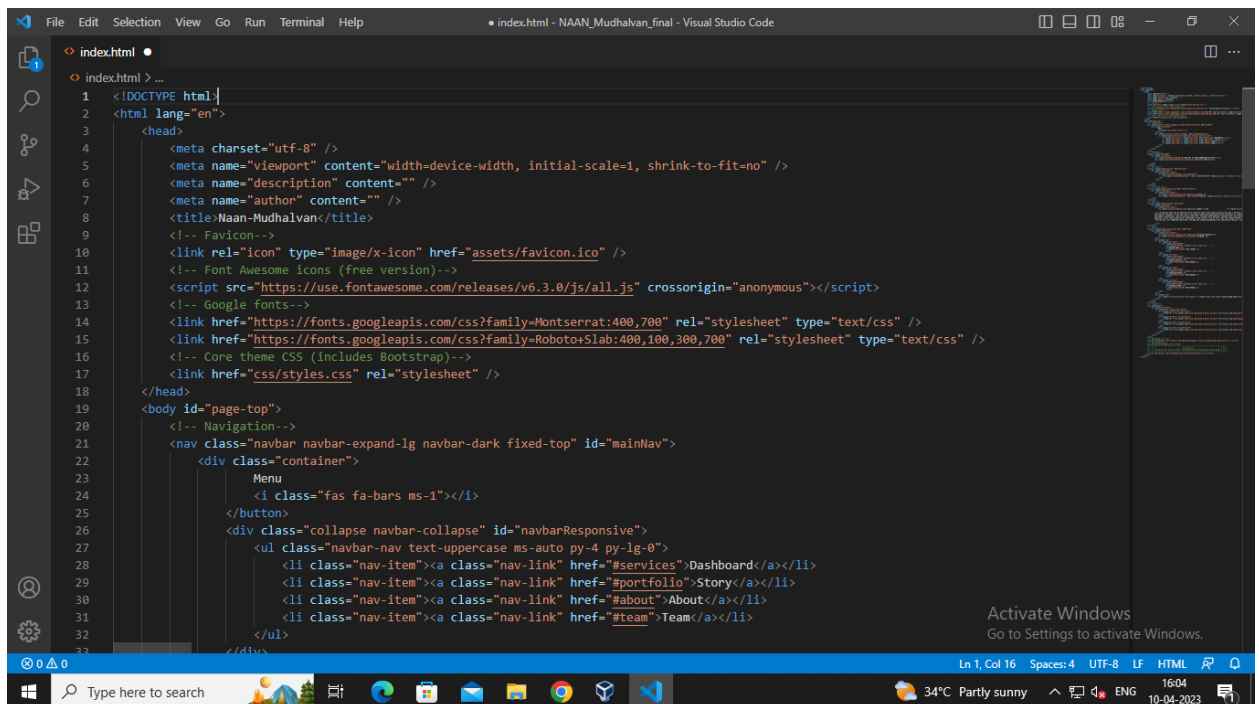
Conclusion currently electric batteries are not the most popular choice for a battery nor are they any were near being the most common used in the cars on the road. However, as they continue to get more efficient , cheaper and easier to dispose of , they can become the most commo car battery in our world.

6. FUTURE SCOPE:

- The EV charging station market is expected to grow 5 to 7 times in the next 5 years. It was valued at 5 billion dollars in 2020 and optimistic predictions see it reach around 35 billion by 2026, which would make EVs represent 15% of all car sales worldwide within 5 years.
- Next Gen EV Batteries Will Deliver 500-Mile Range | Green Cars. Everything you need to know, all in one place. The ultimate resource to compare, search , and find electric cars and trucks.
- According to a joint report by Indian Venture and Alternate Capital Association (IVCA), Industrial law and

EY, the number of charging stations is expected to increase to 100,000 units by 2027 to accommodate the increasing demand by nearly 1.4 million EVs expected to be on the roads by then.

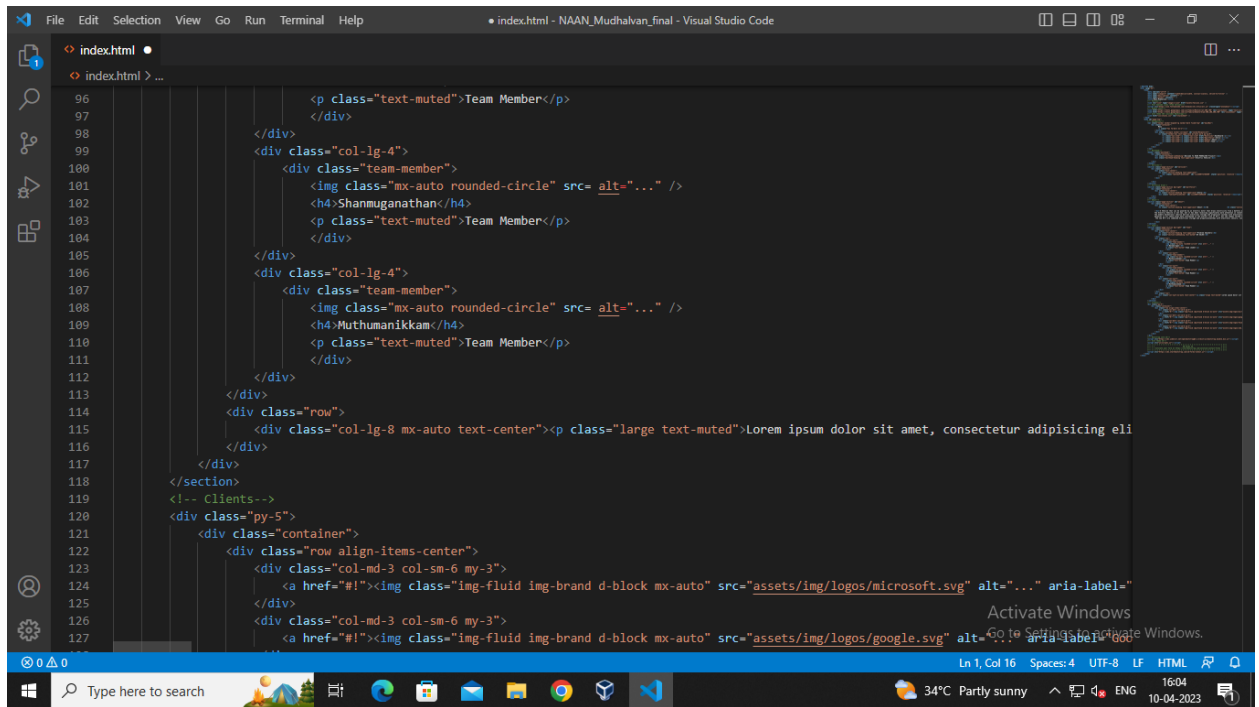
7. APPENDIX:

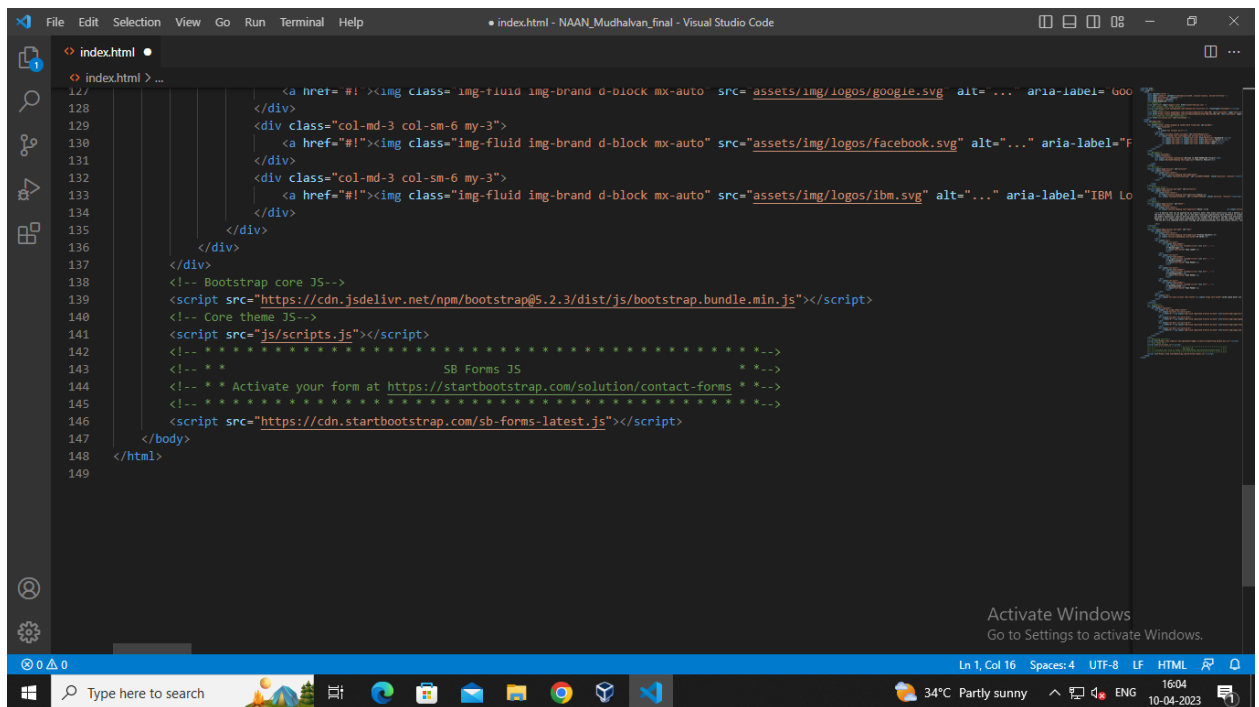


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2 <html lang="en">
3   <head>
4     <meta charset="utf-8" />
5     <meta name="viewport" content="width=device-width, initial-scale=1, shrink-to-fit=no" />
6     <meta name="description" content="" />
7     <meta name="author" content="" />
8     <title>Naan-Mudhalvan</title>
9     <!-- Favicon -->
10    <link rel="icon" type="image/x-icon" href="assets/favicon.ico" />
11    <!-- Font Awesome icons (free version) -->
12    <script src="https://use.fontawesome.com/releases/v6.3.0/js/all.js" crossorigin="anonymous"></script>
13    <!-- Google fonts -->
14    <link href="https://fonts.googleapis.com/css?family=Montserrat:400,700" rel="stylesheet" type="text/css" />
15    <link href="https://fonts.googleapis.com/css?family=Roboto+Slab:400,100,300,700" rel="stylesheet" type="text/css" />
16    <!-- Core theme CSS (includes Bootstrap) -->
17    <link href="css/styles.css" rel="stylesheet" />
18  </head>
19  <body id="page-top">
20    <!-- Navigation -->
21    <nav class="navbar navbar-expand-lg navbar-dark fixed-top" id="mainNav">
22      <div class="container">
23        Menu
24        <i class="fas fa-bars ms-1"></i>
25        </button>
26        <div class="collapse navbar-collapse" id="navbarResponsive">
27          <ul class="navbar-nav text-uppercase ms-auto py-4 py-lg-0">
28            <li class="nav-item"><a class="nav-link" href="#services">Dashboard</a></li>
29            <li class="nav-item"><a class="nav-link" href="#portfolio">Story</a></li>
30            <li class="nav-item"><a class="nav-link" href="#about">About</a></li>
31            <li class="nav-item"><a class="nav-link" href="#team">Team</a></li>
32          </ul>
33        </div>
34      </div>
35    </nav>
36  </body>
37 </html>
```

```
File Edit Selection View Go Run Terminal Help • index.html - NAAN_Mudhalvan_final - Visual Studio Code
index.html > ...
33 </div>
34 </div>
35 </nav>
36 <!-- Masthead-->
37 <header class="masthead">
38 <div class="container">
39 <div class="masthead-subheading">Welcome To NAAN MUDHALVAN Project!</div>
40 <div class="masthead-heading text-uppercase">Electric Vehicle</div>
41 </div>
42 </header>
43 <!-- Services-->
44 <section class="page-section" id="services">
45 <div class="container">
46 <div class="text-center">
47 <h2 class="section-heading text-uppercase">
48 <div class="tableauPlaceholder" id="viz1680772786309" style="position: relative"><noscript><a href="#"><img alt="Dashboard"
49 </h2>
50 </div>
51 </div>
52 </div>
53 </section>
54 <!-- Portfolio Grid-->
55 <section class="page-section bg-light" id="portfolio">
56 <div class="container">
57 <div class="text-center">
58 <h2 class="section-heading text-uppercase">Story</h2>
59 <div class="tableauPlaceholder" id="viz1680772896230" style="position: relative"><noscript><a href="#"><img alt="Story 1" sr
60 </div>
61 </div>
62 </section>
63 <!-- About-->
64 <section class="page-section" id="about">
```

```
File Edit Selection View Go Run Terminal Help • index.html - NAAN_Mudhalvan_final - Visual Studio Code
index.html > ...
64 <section class="page-section" id="about">
65 <div class="container">
66 <div class="text-center">
67 <h2 class="section-heading text-uppercase">About</h2>Ev <h3 class="section-subheading text-muted"></h3>
68 </div>
69 <div>A Vehicle that can be powered by an electric motor that draws electricity from a battery and is capable of being charged fr
70 The Electric Vehicle is not new, but it has been receiving significantly more attention in recent years. Advances in both EV anal
71 The modern mechatronic vehicle marries electrical storage and propulsion systems with electronic sensors, controls, and actuator
72 Advances in all these areas have contributed to the overall rise of EV's, but the common thread that runs through all these elemen
73 The new EV's are combined Electrical storage and propulsionsystems with electronic sensors, controls, and actuatorss, integrated
74 </div>
75 </div>
76 </section>
77 <!-- Team-->
78 <section class="page-section bg-light" id="team">
79 <div class="container">
80 <div class="text-center">
81 <h2 class="section-heading text-uppercase">Problem Smashers</h2>
82 <h3 class="section-subheading text-muted">EV SALES</h3>
83 </div>
84 <div class="row">
85 <div class="col-lg-4">
86 <div class="team-member">
87 
88 <h4>Balamurugan</h4>
89 <p class="text-muted">Team Leader</p>
90 </div>
91 </div>
92 <div class="col-lg-4">
93 <div class="team-member">
94 
95 <h4>Muthusivakumar</h4>
96 <p class="text-muted">Team Member</p>
```





THANK

YOU...!