## **SUSTAINABLE MOBILITY TRACKER: CAR METRICS CALCULATOR**

## A PROJECT REPORT

*Submitted by*

# SAMANYU B RAO [Reg No:RA2011003011063]

# SMIT VICHARE [Reg No: RA2011003011089]

*Under the Guidance of*

# MRS. S. KANMANI

Assistant Professor, Department of Computing Technologies

*in partial fulfillment of the requirements for the degree of*

**BACHELOR OF TECHNOLOGY**

# in

**COMPUTER SCIENCE AND ENGINEERING**



**DEPARTMENT OF COMPUTING TECHNOLOGIES**

# COLLEGE OF ENGINEERING AND TECHNOLOGY

# SRM INSTITUTE OF SCIENCE AND TECHNOLOGY KATTANKULATHUR– 603 203

**OCTOBER 2023**

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Certified that 18CSP109L / I8CSP111L project report titled “**SUSTAINABLE MOBILITY TRACKER: CAR METRICS CALCULATOR**” is the bonafide work of **SAMANYU B RAO [RegNo:RA2011003011063]**  and **SMIT VICHARE [RegNo:RA2011003011089]** who carried out the project work under my supervision. Certified further, that to the best of my knowledge the work reported here in does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion for this or any other candidate.

### Mrs. S. KANMANI

### SUPERVISOR

Assistant Professor

Department of Computing Technologies

### Dr. B. Kanisha

### PANEL HEAD

### Associate Professor

### Department of Computing Technologies

### 

### Dr. M. PUSHPALATHA

### HEAD OF THE DEPARTMENT

Department of Computing Technologies

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 Department of Computing Technologies

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**Degree/Course :** B. Tech in Computer Science and Engineering

S**tudent Names :** SAMANYU B RAO, SMIT VICHARE

**Registration Number :** RA2011003011063, RA2011003011089

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# ACKNOWLEDGEMENT

We express our humble gratitude to **Dr. C. Muthamizhchelvan**, Vice-Chancellor, SRM Institute of Science and Technology, for the facilities extended for the project work and his continued support.

We extend our sincere thanks to Dean-CET, SRM Institute of Science and Technology, **Dr. T. V. Gopal**, for his invaluable support.

We wish to thank **Dr. Revathi Venkataraman**, Professor and Chairperson, School of Computing, SRM Institute of Science and Technology, for her support throughout the project work.

We are incredibly grateful to our Head of the Department, **Dr. M. Pushpalatha,** Professor, Department of Computing Technologies, SRM Institute of Science and Technology, for her suggestions and encouragement at all the stages of the project work.

We want to convey our thanks to our Project Coordinators, **Mrs. S. Kanmani,** Panel Head, **Dr. B. Kanisha**, Associate Professor and Panel Members, **Dr. G. Balamurugan** Assistant Professor, **Dr. Sworna Kokila** Assistant Professor, Department of Computing Technologies, SRM Institute of Science and Technology, for their inputs during the project reviews and support.

We register our immeasurable thanks to our Faculty Advisor, **Dr. C. Pretty Diana Cyril** and **Dr. Jansi K R**, Assistant Professor, Department of Computing Technologies, SRM Institute of Science and Technology, for leading and helping us to complete our course.

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Our inexpressible respect and thanks to our guide, **Mrs. S. KANMANI**, Assistant Professor, Department of Computing Technologies, SRM Institute of Science and Technology, for providing us with an opportunity to pursue our project under his / her mentorship. He / She provided us with the freedom and support to explore the research topics of our interest. His / Her passion for solving problems and making a difference in the world has always been inspiring.

We sincerely thank all the staff and students of Computing Technologies Department, School of Computing, S.R.M Institute of Science and Technology, for their help during our project. Finally, we would like to thank our parents, family members, and friends for their unconditional love, constant support and encouragement.

# SAMANYU B RAO [Reg. No: RA2011003011063]

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# SMIT VICHARE [Reg. No: RA2011003011089]

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**ABSTRACT**Top of Form

This report presents a web application designed to predict vehicle fuel consumption and facilitate model comparisons for various car makes and models. The application leverages machine learning models to provide accurate predictions and offers a user-friendly interface for comparing the specifications of different vehicles.

The web application, built using Flask, offers two primary functionalities: fuel consumption prediction and vehicle model comparison. Four trained machine learning models (linear regression, ridge regression, lasso regression, and elastic net regression) are employed to predict carbon dioxide (CO2) emissions based on user-provided vehicle features, such as engine size and number of cylinders. The application selects the best-fitting model and displays the closest prediction to the actual CO2 emissions, accompanied by an error percentage. This feature is particularly useful for individuals and organizations looking to make informed decisions about vehicle choices and their environmental impact.

The second major functionality of the web application enables users to compare the specifications of different vehicle models. Users can select car makes and models, and the application retrieves detailed specifications from a provided CSV file. The report includes a robust description of how the application extracts and presents vehicle specifications, which can aid consumers, car enthusiasts, and industry professionals in comparing various vehicle attributes, such as fuel consumption, CO2 emissions, engine size, cylinders, vehicle class, and transmission.

The application incorporates responsive web design and data visualization, making it accessible and user-friendly on various devices. Users can interact with the application through a simple, intuitive user interface, enhancing the overall user experience.

This report details the technical aspects of the web application, including the integration of machine learning models, data extraction and presentation of vehicle specifications, and the use of the Flask framework for web development. It also highlights the significance of the application for users seeking accurate fuel consumption predictions and vehicle model comparisons.

In summary, the "Sustainable Mobility Tracker: Car Metrics Calculator" offers valuable tools for users interested in making informed vehicle choices and exploring the specifications of different car models. Its user-friendly design and machine learning capabilities make it a valuable resource in the automotive industry and beyond.

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**LIST OF SYMBOLS AND ABBREVIATIONS**

**ReLU** Rectified Linear Unit

**GAN** Generative Adversarial Network

**CNN** Convolutional Neural Network

**XAI** Explainable Artificial Intelligence

**AI** Artificial Intelligence

**ML** Machine Learning

**MRI** Magnetic Resonance Imaging

**CT** Computed Topography

**CO2** Carbon Dioxide

**MSE** Mean Squared Error

**RMSE** Root Mean Squared Error

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