*A Mini Project Report on*

**SYMPTRACK – A MACHINE LEARNING APPROACH FOR PREDICTING HEART DISEASE AND DIABETES**

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

# BACHELOR OF TECHNOLOGY

In

# CSE (DATA SCIENCE)

By

**POTLA BHAVYA** (21AG1A6754)

**LODI ABHIRAM** (21AG1A6738)

**BANDHARAM THARUN GOUD** (21AG1A6761)

**TIRUMALA SRIVATHSA** (21AG1A6762)

Under the guidance of

**Mr. M. Hari Krishna**

Assistant Professor



**DEPARTMENT OF CSE (DATA SCIENCE)**

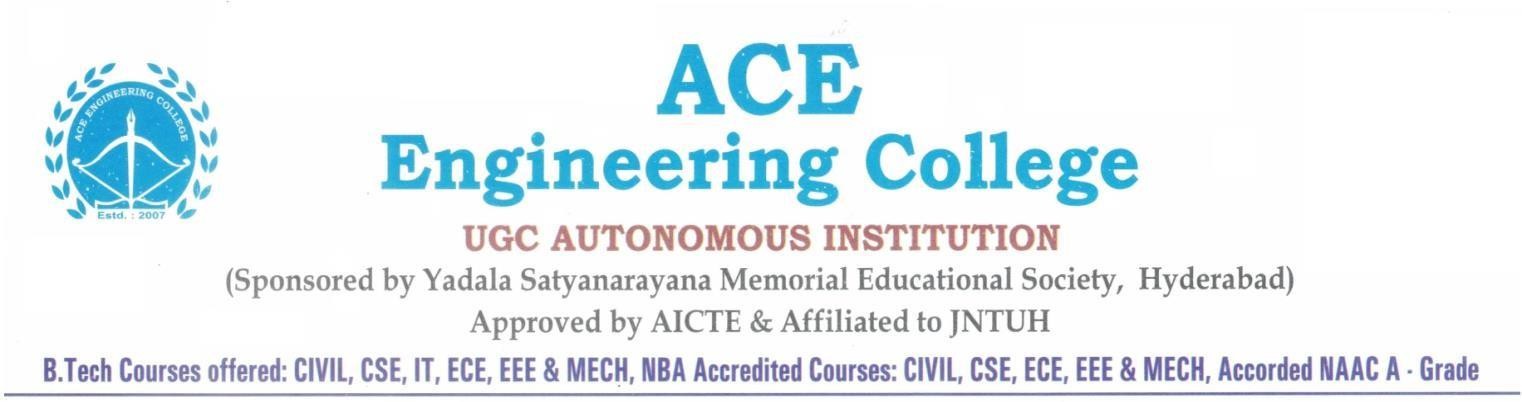
**ACE Engineering College**

**Ankushapur(V), Ghatkesar(M), Medchal Dist - 501 301**

***(An Autonomous Institution, Affiliated to JNTUH, Hyderabad)***

[www.aceec.ac.in](http://www.aceec.ac.in/)

**2024-2025**



**DEPARTMENT OF CSE (DATA SCIENCE)**

**CERTIFICATE**

This is to certify that the mini project report entitled “**Symptrack – A Machine Learning Approach for Predicting Heart Disease and Diabetes**” is a Bonafide work done by ***Potla Bhavya (21AG1A6754), Lodi Abhiram (21AG1A6738), Bandharam Tharun Goud (21AG1A6761), Tirumala Srivathsa (21AG1A6762),*** in partial fulfillment for the award of Degree of BACHELOR OF TECHNOLOGY in ***CSE (Data Science)*** from JNTUH University, Hyderabad during the academic year 2024- 2025. This record of Bonafide work carried out by them under our guidance and supervision.

The results embodied in this report have not been submitted by the student to any other University or Institution for the award of any degree or diploma*.*

|  |  |  |
| --- | --- | --- |
| **Mr. M. Hari Krishna** | **Dr. P. Chiranjeevi** | **External** |
| Assistant Professor  Supervisor | Associate Professor  H.O.D, CSE-DS |  |
|  |  |  |

# ACKNOWLEDGEMENTS

we would like to express our gratitude to all the people behind the screen who have helped our transform an idea into a real time application.

we would like to express our heart-felt gratitude to our parents without whom we would not have been privileged to achieve and fulfill our dreams.

A special thanks to our General Secretary, **Prof. Y. V. Gopala Krishna Murthy,** for having founded such an esteemed institution. Sincere thanks to our Joint Secretary **Mrs. M. Padmavathi**, for support in doing project work. we are also grateful to our beloved principal, **Dr. B. L. RAJU** for permitting us to carry out this project.

we profoundly thank **Dr. P. Chiranjeevi**, Associate Professor and Head of the Department of Computer Science and Engineering (Data Science), who has been an excellent guide and also a great source of inspiration to our work.

we extremely thank **Mr. P. Ashok Kumar and Mr. Shaik Nagur Vali,** Associate Professors, Project coordinators, who helped us in all the way in fulfilling of all aspects in completion of our Major-Project.

we are very thankful to my internal guide **Mr. M. Hari Krishna** who has been an excellent and also given continuous support for the Completion of our project work.

The satisfaction and euphoria that accompany the successful completion of the task would be great, but incomplete without the mention of the people who made it possible, whose constant guidance and encouragement crown all the efforts with success. In this context, we would like to thank all the other staff members, both teaching and non-teaching, who have extended their timely help and eased our task.

**P. Bhavya (21AG1A6754)**

**L. Abhiram (21AG1A6738)**

**B. Tharun (21AG1A6761)**

**T. Srivathsa (21AG1A6762)**

**SYMPTRACK – A MACHINE LEARNING APPROACH FOR PREDICTING HEART DISEASE AND DIABETES**

# ABSTRACT

This study explores the application of machine learning (ML) to predict multiple diseases, with a primary focus on diabetes. Leveraging patient data such as age, lifestyle habits, medical history, and laboratory results, we aimed to build an efficient predictive model for early diagnosis. Various ML algorithms, including Logistic Regression, Decision Trees, Random Forest, Support Vector Machines (SVM) were implemented and tested for accuracy and reliability.

Among the models, Random Forest emerged as the top performer, demonstrating exceptional accuracy in predicting diabetes. Furthermore, the model showed potential for extending its capabilities to predict other conditions like hypertension. This underscores its adaptability and effectiveness in addressing broader healthcare challenges.

The system is implemented as a user-friendly web application designed to assist healthcare professionals and patients. It simplifies the process of early detection, enabling timely interventions and effective health management. With continuous monitoring and regular updates, the system ensures it remains accurate and relevant in dynamic healthcare environments.

This initiative highlights the transformative potential of ML in healthcare, paving the way for proactive and personalized patient care. By utilizing advanced technology, we contribute to improving health outcomes and enhancing the efficiency of healthcare systems.

**CONTENTS**

|  |  |  |  |
| --- | --- | --- | --- |
| **S.NO** | **CHAPTER NAME** | | **PAGE NO** |
| **1** | **INTRODUCTION** | | **1** |
| **2** | **EXPLORATORY DATA ANALYSIS** | | **5** |
| **3** | **LITERATURE SURVEY ABOUT TOPIC** | | **7** |
| **4** | **SYSTEM REQUIREMENT ANALYSIS**  4.1 Existing System  4.2 Proposed Model  4.3 Software Requirements  4.4 Hardware Requirements  4.5 System Analysis | | **8-23** |
| **5** | **SYSTEM DESIGN**  5.1 Pipeline Architecture  5.2 Use Case Diagram  5.3 Sequence Diagram  5.4 Data Flow Diagram | | **24-39** |
| **6** | **RESULT**  6.1 Heart Disease Dataset  6.2 Diabetes Dataset  6.3 Predictive System (User Interface) | | **40-50** |
| **7** | **DISCUSSION**  7.1 Interpretation of the results in the context of problem  7.2 Strengths and weaknesses | | **51** |
| **8** | **CONCLUSION** | | **53** |
| **9** | **FUTURE WORKS** | | **55** |
|  | **REFERENCES** | |  |
|  | **PAPER PUBLIACTION** | |  |
|  |  |

**LIST OF FIGURES**

|  |  |  |
| --- | --- | --- |
| **S.NO** | **FIGURE NAME** | **PAGE NO** |
| **5.1** | **PIPELINE ARCHITECTURE** | **24** |
| **5.2** | **USECASE DIAGRAM** | **32** |
| **5.3** | **SEQUENCE DIAGRAM** | **35** |
| **5.4** | **DATAFLOW DIAGRAM** | **37** |
|  |  |  |