PRESIDENCY UNIVERSITY
Private University Estd. in Karnataka State by Act No. 41 of 2013
Itgalpura, Rajankunte, Yelahanka, Bengaluru – 560064

NUTRIGUIDE: AI – POWERED NUTRITION PLANNING PLATFORM FOR ATHLETES IN DEVELOPING REGIONS

A PROJECT REPORT

Submitted by

SYED ABDULLAH HUSSAINI – 20221CIT0034

HARSHAVARDHAN – 20221CIT0069

SHRISHA JAMAKHANDIKAR – 20221CIT0127

Under the guidance of,

Mr. E SAKTHIVEL

BACHELOR OF TECHNOLOGY

IN

COMPUTER SCIENCE AND ENGINEERING, (INTERNET OF THINGS)

PRESIDENCY UNIVERSITY

BENGALURU

DECEMBER 2025

PRESIDENCY UNIVERSITY

Private University Estd. in Karnataka State by Act No. 41 of 2013
Itgalpura, Rajanukunte, Yelahanka, Bengaluru – 560064

PRESIDENCY SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

BONAFIDE CERTIFICATE

Certified that this report "NutriGuide: AI – Powered Nutrition Planning Platform For Athletes In Developing Regions" is a bonafide work of "Syed Abdullah Hussaini (20221CIT0034), Harshavardhan (20221CIT0069), Shrisha Jamakhandikar (20221CIT0127)", who have successfully carried out the project work and submitted the report for partial fulfilment of the requirements for the award of the degree of BACHELOR OF TECHNOLOGY in COMPUTER SCIENCE AND ENGINEERING, INTERNET OF THINGS during 2025-26.

Mr. E Sakthivel
Project Guide
PSCS
Presidency University

Dr. Sharmeeth Vali Y
Program Project Coordinator
PSCS
Presidency University

Dr. Sampath A K
Dr. Geetha A
School Project Coordinators
PSCS
Presidency University

Dr. Anandaraj S P
Head of the Department
PSCS
Presidency University

Dr. Shakkeera L
Associate Dean
PSCS
Presidency University

Dr. Duraipandian N
Dean
PSCS & PSIS
Presidency University

Examiners

Sl. no.	Name	Signature	Date
1	Dr. Vijaya kumar Av.		1/12/25
2	Dr. Shameem vali		1/12/25

PRESIDENCY UNIVERSITY

PRESIDENCY SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

DECLARATION

We the students of final year B.Tech in COMPUTER SCIENCE AND ENGINEERING, INTERNET OF THINGS at Presidency University, Bengaluru, named Syed Abdullah Hussaini, Harshavardhan, Shrisha Jamakhandikar, hereby declare that the project work titled "NutriGuide: AI – Powered Nutrition Planning Platform For Athletes In Developing Regions" has been independently carried out by us and submitted in partial fulfilment for the award of the degree of B.Tech in COMPUTER SCIENCE ENGINEERING, INTERNET OF THINGS during the academic year of 2025-26. Further, the matter embodied in the project has not been submitted previously by anybody for the award of any Degree or Diploma to any other institution.

Syed Abdullah Hussaini	20221CIT0034
Harshavardhan	20221CIT0069
Shrisha Jamakhandikar	20221CIT0127

PLACE: BENGALURU
DATE: 01/12/2025

ACKNOWLEDGEMENT

For completing this project work, we have received the support and the guidance from many people whom I would like to mention with deep sense of gratitude and indebtedness. We extend our gratitude to our beloved **Chancellor, Pro-Vice Chancellor, and Registrar** for their support and encouragement in completion of the project.

I would like to sincerely thank my internal guide **Mr. E Sakthivel, Assistant Professor**, Presidency School of Computer Science and Engineering, Presidency University, for his moral support, motivation, timely guidance and encouragement provided to us during the period of our project work.

I am also thankful to **Dr. Anandaraj S P, Professor, Head of the Department, Presidency School of Computer Science and Engineering** Presidency University, for his mentorship and encouragement.

We express our cordial thanks to **Dr. Duraipandian N**, Dean PSCS & PSIS, **Dr. Shakkeera L**, Associate Dean, Presidency School of computer Science and Engineering and the Management of Presidency University for providing the required facilities and intellectually stimulating environment that aided in the completion of my project work.

We are grateful to **Dr. Sampath A K, and Dr. Geetha A, PSCS** Project Coordinators, **Dr. Sharmast Vali, Program Project Coordinator**, Presidency School of Computer Science and Engineering, or facilitating problem statements, coordinating reviews, monitoring progress, and providing their valuable support and guidance.

We are also grateful to Teaching and Non-Teaching staff of Presidency School of Computer Science and Engineering and also staff from other departments who have extended their valuable help and cooperation.

SYED ABDULLAH HUSSAINI

HARSHAVARDHAN

SHRISHA JAMAKHANDIKAR

ABSTRACT

This project presents NutriGuide, an AI-powered nutrition planning platform designed to deliver affordable, adaptive, and evidence-based dietary guidance to athletes in developing regions. The system addresses critical challenges such as limited access to professional dieticians, lack of sport-specific nutrition personalization, and the absence of dynamic diet–training synchronization in current fitness applications.

NutriGuide combines machine learning models, mobile-based user interaction, and sports nutrition databases to generate personalized diet plans tailored to the athlete's age, sport type, training load, and physiological parameters. The system integrates data from nutrition APIs and WHO/IOC guidelines to ensure scientific validity while enabling adaptive AI-driven recommendations.

The architecture comprises a React.js front-end, Node.js backend connected through a Supabase interface and database. The platform operates under a freemium model, providing essential features free of cost and offering premium options for advanced analytics, training synchronization, and wearable integration.

Model validation using a synthetic athlete dataset achieved an accuracy of 84.2%, with 82.6% precision and 80.8% recall in macro-nutrient balance prediction. The platform demonstrated 60% faster meal planning compared to manual diet chart creation and improved athlete satisfaction by 45% in pilot usability trials.

NutriGuide contributes to SDG 2 (Zero Hunger) and SDG 3 (Good Health and Well-Being) by promoting nutrition accessibility, awareness, and sustainable dietary habits.

TABLE OF CONTENT

LIST OF FIGURES

LIST OF TABLES

ABBREVIATIONS

Abbreviation	Full Form
AI	Artificial Intelligence
API	Application Programming Interface
CDN	Content Delivery Network
CSV	Comma Separated Values
DB	Database
HTML	HyperText Markup Language
IFF	Identification of Friend or Foe
InfluxDB	Time-Series Database
IOC	International Olympic Committee
JSON	JavaScript Object Notation
JWT	JSON Web Token
ML	Machine Learning
NLP	Natural Language Processing
QoS	Quality of Service
REST	Representational State Transfer
RF	Random Forest
SDG	Sustainable Development Goal
SDK	Software Development Kit
SQLite	Structured Query Language Lite
SVM	Support Vector Machine
TF	Tensor Flow
UI	User Interface
URL	Uniform Resource Locator
UX	User Experience
WHO	World Health Organization