Personal Fitness Tracker

A Project Report

submitted in partial fulfillment of the requirements

of

AICTE Internship on AI: Transformative Learning
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by

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ABSTRACT

This project focuses on building a **Personal Fitness Tracker** using **Streamlit** and **Machine Learning** to predict calories burned during exercise based on user input parameters such as age, BMI, duration, heart rate, and body temperature. The system employs **Random Forest Regression** for prediction. The primary objective is to help users estimate their calorie expenditure based on personalized data.

The dataset used comprises exercise and calorie data, which has been preprocessed and split into training and testing sets. The model is trained using **Scikit-learn**, and a **Streamlit-based web interface** allows users to input their parameters and receive real-time predictions.

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CHAPTER 1

Introduction

1.1 Problem Statement

The increasing focus on fitness and health demands personalized tracking systems that help users monitor calorie burn efficiently. Current solutions lack interactive, machine-learning-based prediction systems that adapt to user inputs. Many fitness tracking applications rely on generic formulas that do not provide accurate results for individual users. This project aims to bridge that gap by incorporating machine learning models to offer better predictions.

1.2 Motivation

With rising health concerns, people are more inclined to track their fitness. However, most fitness applications rely on static calculations rather than dynamic AI-powered models. This project aims to provide an AI-powered fitness tracker that personalizes calorie expenditure estimation based on real-time user inputs. The implementation of machine learning models allows for better accuracy and adaptability to user-specific health metrics.

1.3 Objectives

- Develop a Streamlit-based web application for calorie burn prediction.
- Utilize Machine Learning (Random Forest Regressor) for accurate predictions.
- Enhance user interactivity with a simple UI.
- Provide comparative insights based on historical fitness data.
- Improve prediction reliability by integrating a comprehensive dataset with multiple variables.

1.4 Scope of the Project

- The system predicts calories burned based on user input.
- Uses pre-existing datasets of exercise metrics.
- Can be extended for mobile or smartwatch integration.
- Allows users to compare their fitness levels with others and adjust their workout routines accordingly.

CHAPTER 2

Literature Survey

- Review of existing **fitness tracking apps** and ML models for calorie prediction.
- Comparison between traditional calorie estimation methods and machine-learning-based approaches.
- Limitations of traditional formula-based calorie estimation.
- Overview of **Random Forest Regressor** and why it is used in this project.
- How similar models have been used in different domains such as healthcare and sports analytics.

CHAPTER 3
PROPOSED METHODOLOGY

System Design

- User Interface: Streamlit-based web app.
- Data Processing: CSV-based dataset of exercise and calories.
- Machine Learning Model: Random Forest Regressor.
- Prediction Output: Displays estimated calories burned and comparative insights.
- Data Cleaning: Handling missing values, outlier removal, and feature scaling.

Requirement Specification

Hardware Requirements

- Computer with Python 3.x installed
- Minimum 4GB RAM
- GPU-enabled system for faster computations (optional)

Software Requirements

- Python
- Streamlit
- Scikit-learn
- Pandas, Numpy, Matplotlib
- Seaborn for data visualization

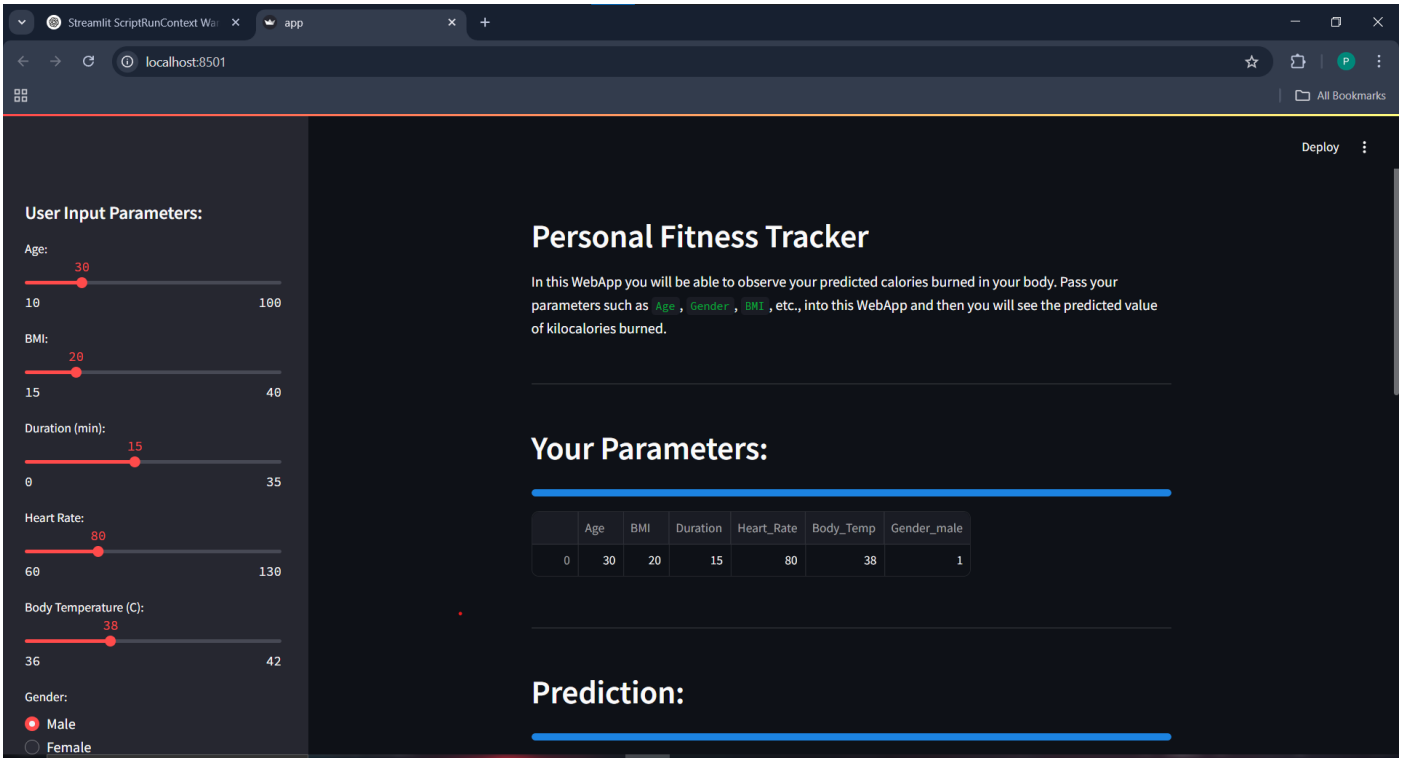
CHAPTER 4

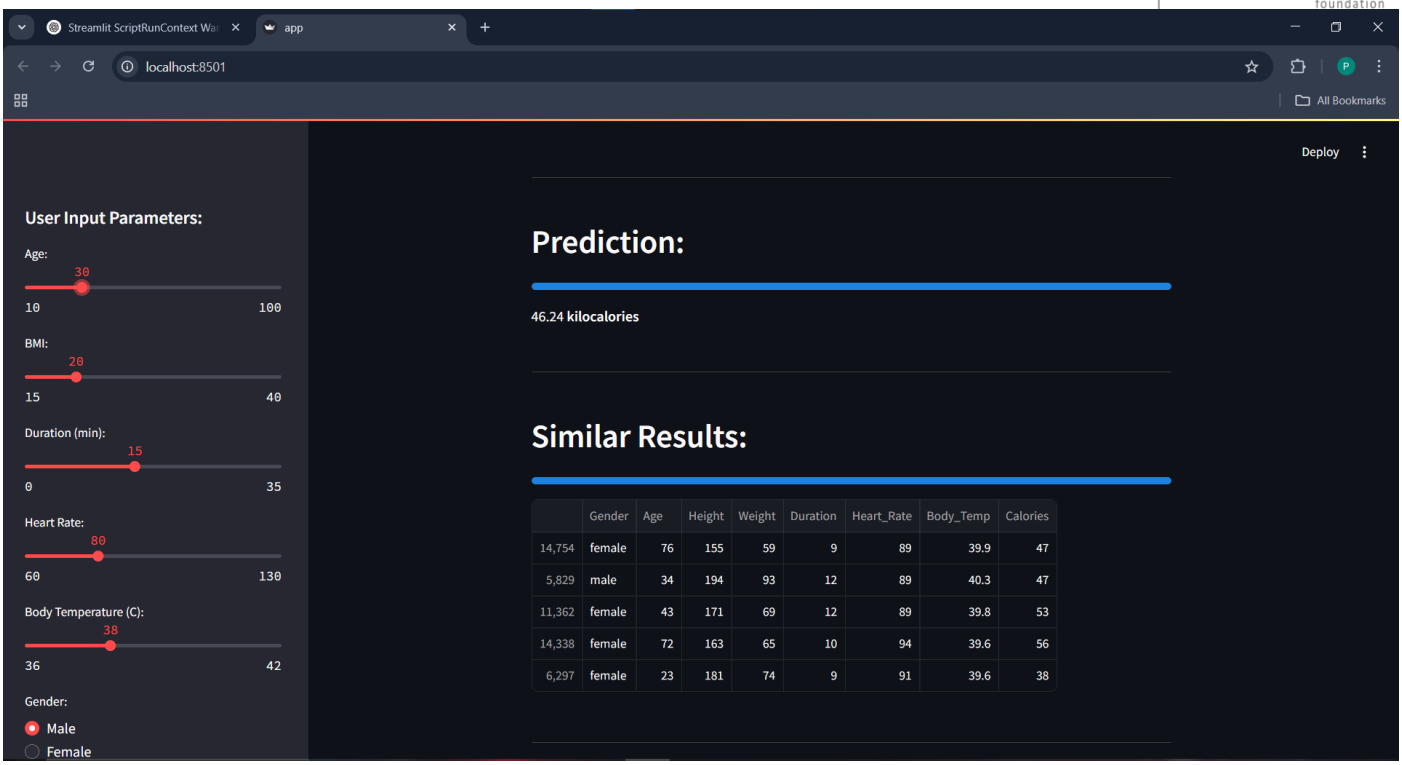
IMPLEMENTATION AND RESULTS

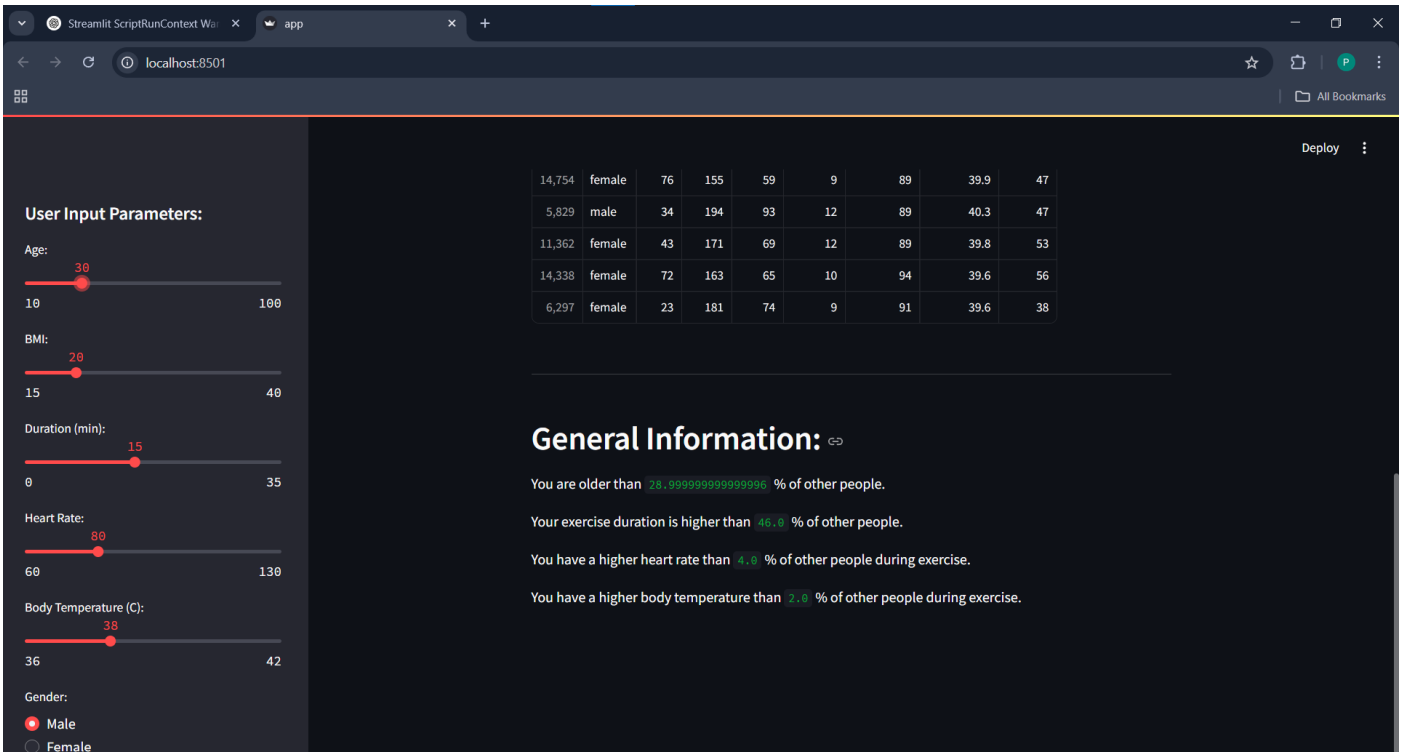
Code Implementation

- Data processing using Pandas.
- Model training using RandomForestRegressor.
- UI creation using Streamlit.
- Feature engineering to improve model accuracy.

Snapshot of the Web Application







GitHub Link

https://github.com/manteshswami/-Personal-Fitness-tracker-AICTE-edunet-Foundation

CHAPTER 5
DISCUSSION AND CONCLUSION

Future Work

- Improve prediction accuracy with more advanced models.
- Deploy as a mobile app.
- Include real-time health monitoring via wearables.
- Use deep learning techniques to improve personalization.
- Integrate AI-powered virtual coaching to provide recommendations based on calorie predictions.

Conclusion

This project successfully implements a machine learning-powered fitness tracker using Streamlit. It allows users to estimate calorie expenditure based on various parameters, offering a personalized fitness tracking experience. The model can be expanded with more data and enhanced with deep learning algorithms to provide better accuracy and usability for a broader audience.

REFRENCES

1. Scikit-learn Documentation: https://scikit-learn.org/
2. Streamlit Documentation: https://docs.streamlit.io/
3. Research papers on calorie prediction models.
4. Machine Learning in Healthcare - A Review.