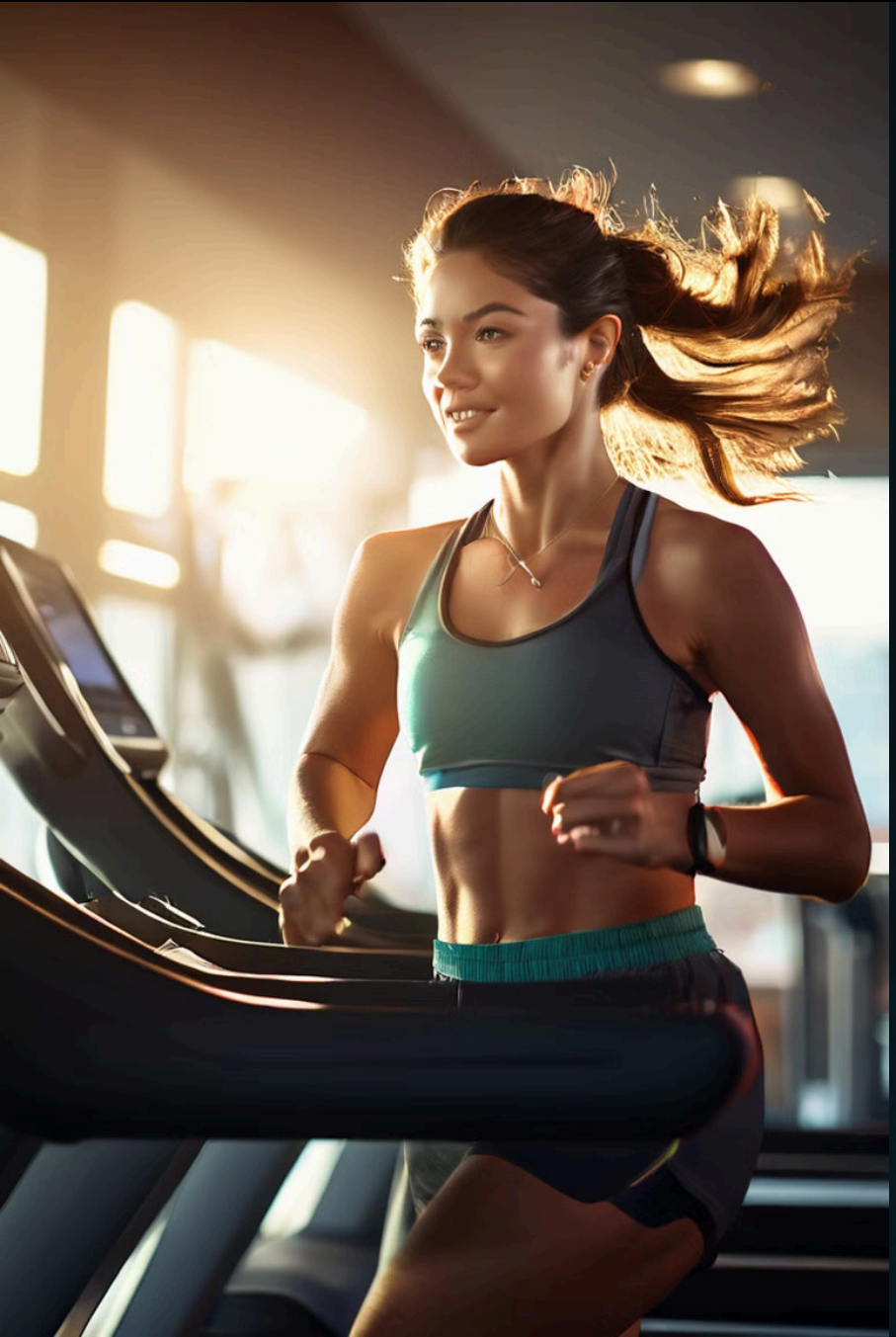


Calories Burnt Prediction Project

This project aims to predict the number of calories burnt during exercise using machine learning techniques. The project utilizes two datasets containing user information and exercise details to train an XGBoostRegressor model. The model's performance is evaluated using the absolute mean error, and a predictive system is developed to estimate calorie expenditure.

by Sankari C

Project Datasets and Objectives

Datasets

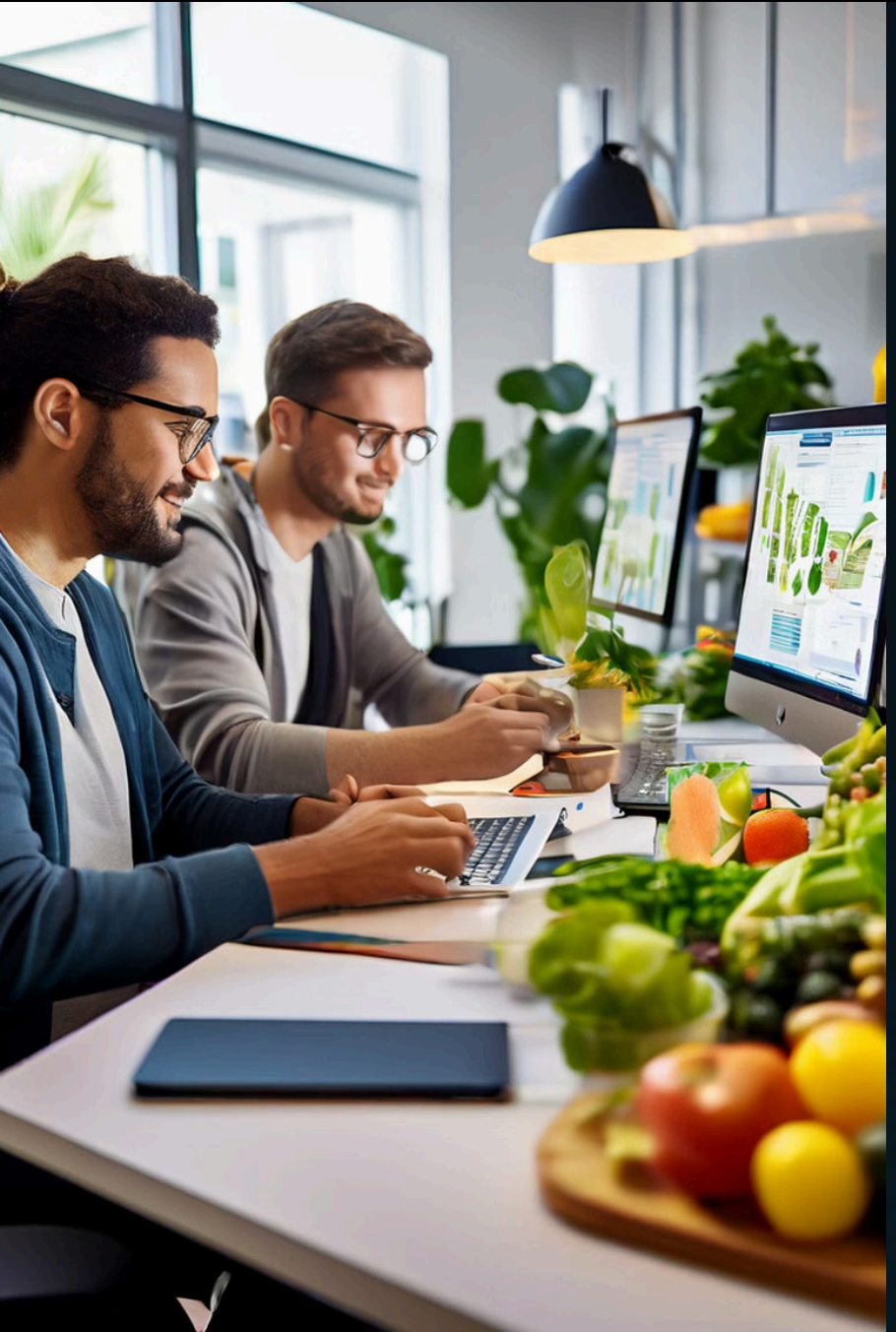
The project uses two datasets: one containing calorie information and another with user details such as User_ID, Gender, Age, Height, Weight, Duration, Heart_Rate, and Body_Temp.

Objectives

The primary objective is to predict the number of calories burnt during exercise. The project also analyzes the relationship between exercise and body temperature, as well as the correlation between heart rate and exercise duration.

Project Workflow Overview

1. **Data Sets**
   Collection of exercise and user data.
2. **Data Preprocessing**
   Cleaning and preparing the data for analysis.
3. **Data Analysis**
   Exploring and understanding the data patterns.
4. **Train Test Split**
   Dividing the data for model training and testing.
5. **XGBoostRegressor**
   Training the model to predict calorie expenditure.
6. **Evaluation**
   Assessing the model's performance.



Data Collection and Preprocessing

1 **Loading Datasets**

The exercise and calorie datasets are loaded into the project.

2 **Combining Datasets**

The two datasets are combined using the concatenation method.

3 **Shape and Information**

The shape of the combined dataset is checked, and basic information is obtained.

4 **Missing Values**

The dataset is checked for any missing values.

Data Analysis: Statistical Measures

Age

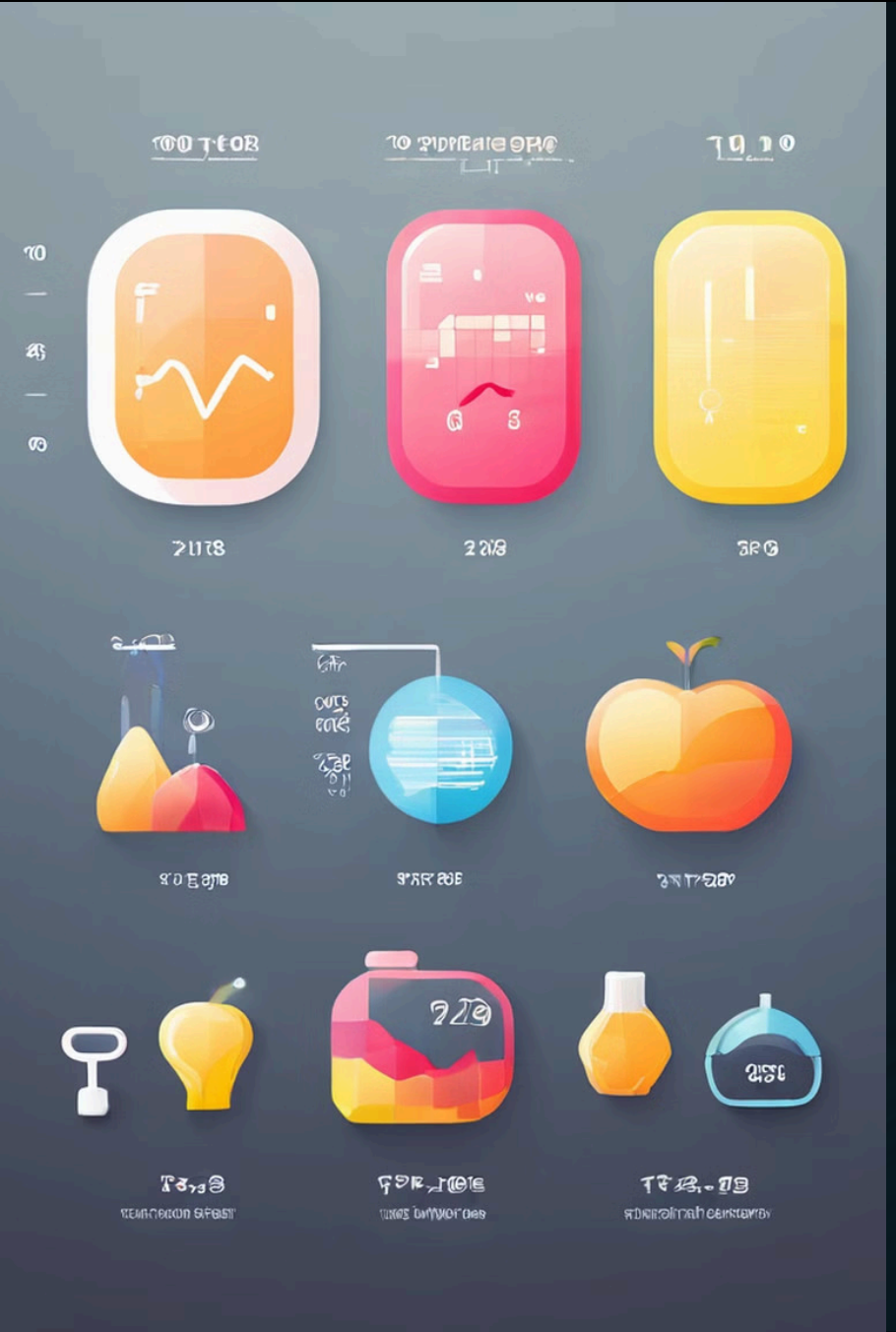
The age of people who exercise ranges from 20 to 79 years.

Height

The height of people who exercise ranges from 123 to 222 cm.

Weight

The weight of people who exercise ranges from 36 to 132 kg.



Data Analysis: Exercise Metrics

Duration

Exercise duration ranges from 1 to 30 minutes.

Heart Rate

Heart rate during exercise ranges from 67 to 128 bpm.

Body Temperature

Body temperature during exercise ranges from 37 to 41 degrees Celsius.

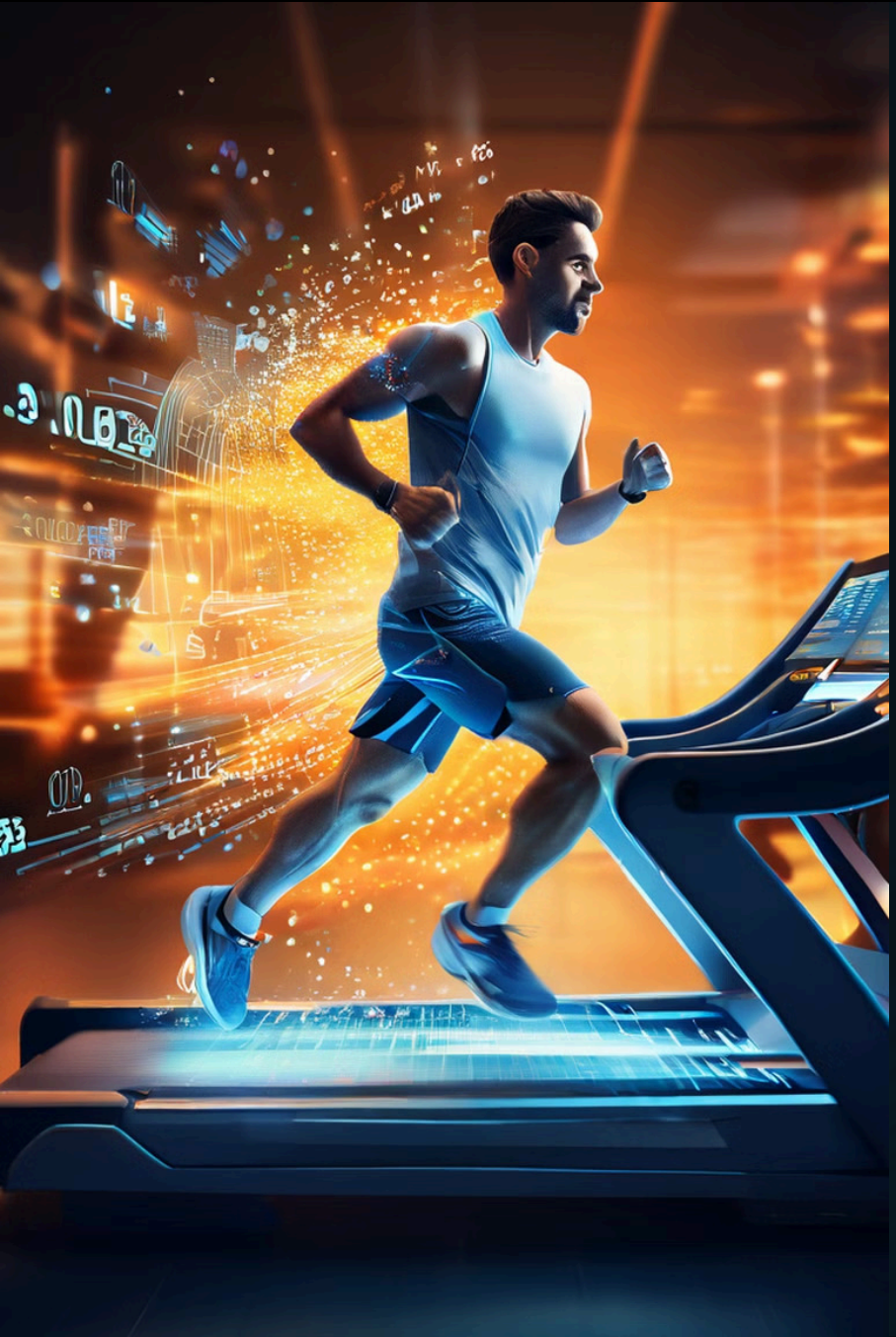
Visualization of the Analysis

Gender Distribution

Analyzing the distribution of the gender column to compare data points for males and females.

Age Distribution

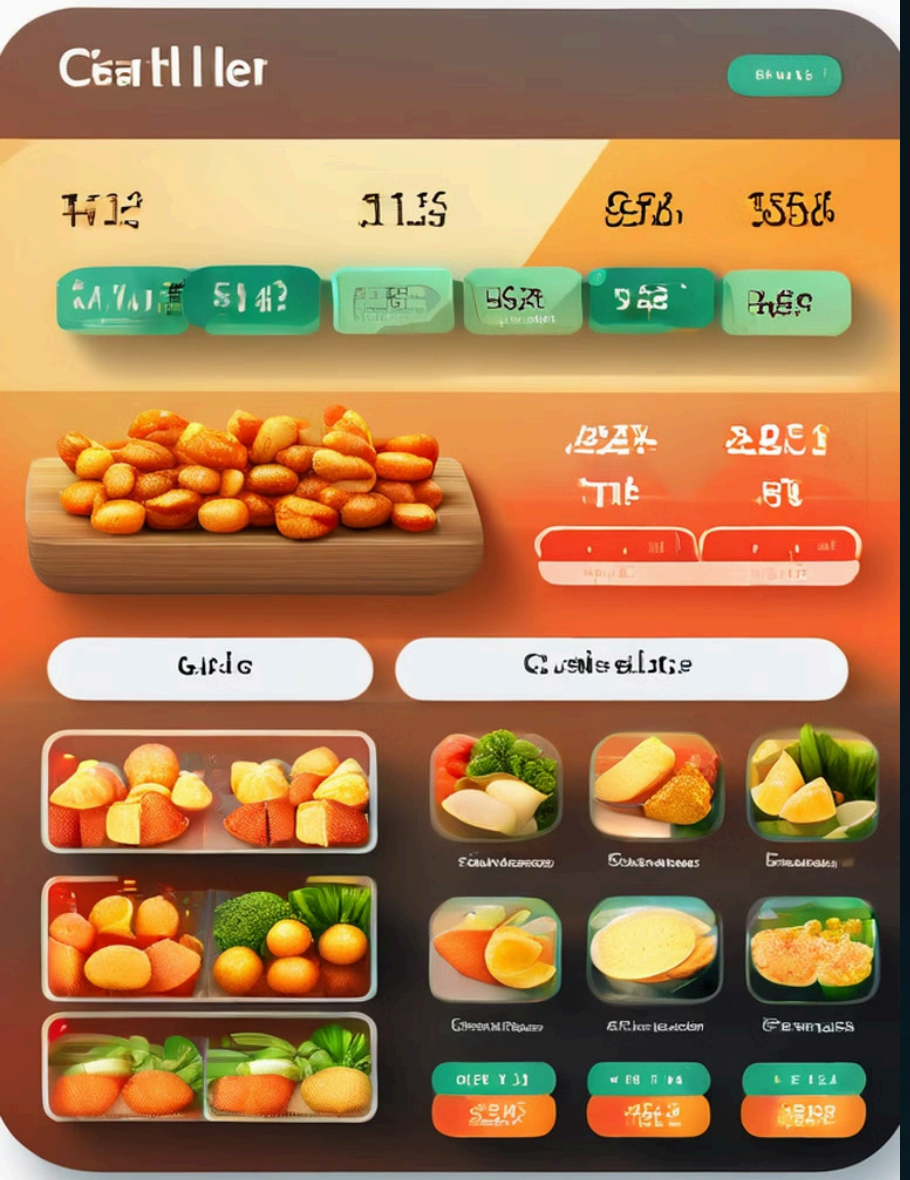
Analyzing the distribution of the age column to understand the age range of the participants.



Model Training and Evaluation

The data is split into feature data and targeted data, and then further split into training and testing sets. The XGBoostRegressor model is trained on the training data. The model's performance is evaluated on the test data, and the absolute mean error is calculated.

The absolute mean error is found to be 1.4833678883314132, which is a very good value, indicating that the model's predictions are very close to the actual values.



Predictive System for Calorie Expenditure

A predictive system is developed to predict the number of calories burnt during exercise. This system can be used to estimate calorie expenditure based on user inputs such as age, gender, height, weight, exercise duration, heart rate, and body temperature.