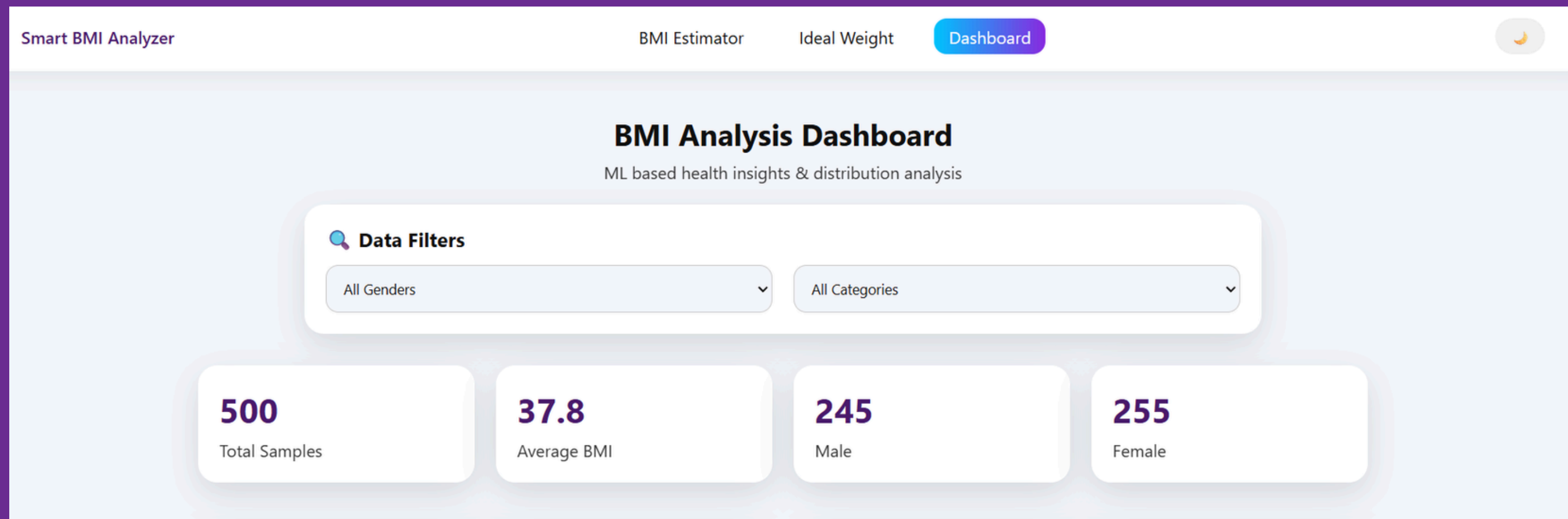


Estimate the BMI

Machine Learning & Data Visualization
Based System

Tamanna Shahid Ashfaq Shaikh,
Naviotech Solutions



Introduction to BMI

Understanding Body Mass
Index and its significance in
healthcare

BMI is a key metric for assessing health
and obesity risks.

Smart BMI Analyzer

AI-Powered Health Analytics

Smart BMI Analyzer & Ideal Weight Advisor

Leveraging advanced machine learning algorithms to provide precise BMI calculations, personalized health insights, and data-driven weight recommendations.

ML-Powered
Advanced algorithms

Real-time
Instant results

Personalized
Custom insights


Get Started →

99.2%
Accuracy

10K+
Analyses

4
Metrics

24/7
Available



Problem Statement

01 Lacks Interactivity

Manual BMI calculation does not allow users to interact or explore their data dynamically, limiting insights.

02 No Visual Understanding

Traditional methods fail to provide visual representations of BMI categories, making it difficult for users to interpret results.

03 Intelligent Visual System

There is a need for an intuitive, user-friendly system that presents BMI data visually for better decision-making.

The Limitation of Manual BMI

It petllibsitics endercamamadol
BMI calculation



Interectiualty:

Charppeting ar: Intersome
acsuctatt; your the you swm
thismall on the 020%, ap st
parsm bml.



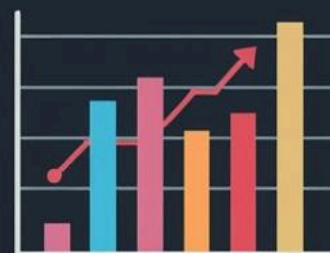
Manuels in sight: as accu pasinics

intencalith. wasating
mangling health mont the
breerse in BMli phyrepfest.



Insight: at

Uf temallinat as rer Ignatfies
dmirentiuctof reennatiom,
heactha entletiny. fol get;
digar conces.



Project Objectives

01 Estimate BMI

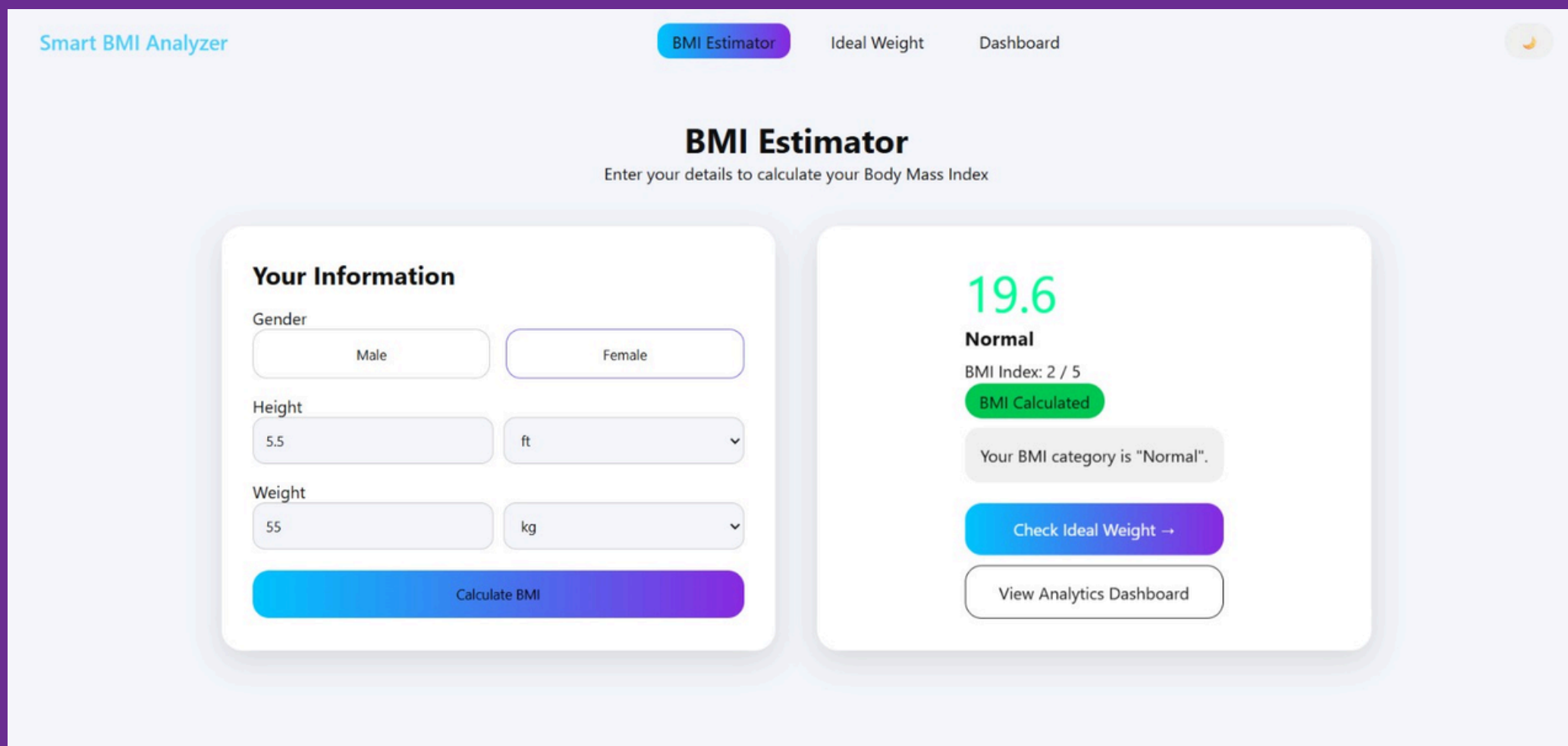
Accurately calculate BMI using user-provided height, weight, and gender data for personalized health insights.

02 Classify BMI

Categorize BMI results into health classifications, such as underweight, normal, overweight, and obese for easy understanding.

03 Provide Visual Insights

Generate interactive charts and dashboards to enhance the user's comprehension of BMI data and trends.



The screenshot displays the 'Smart BMI Analyzer' web application. At the top, there is a navigation bar with links for 'BMI Estimator' (highlighted in blue), 'Ideal Weight', and 'Dashboard'. The main heading is 'BMI Estimator' with a subtext 'Enter your details to calculate your Body Mass Index'. The interface is divided into two main sections. The left section, titled 'Your Information', contains input fields for 'Gender' (with 'Male' and 'Female' buttons), 'Height' (with a value of '5.5' and a unit dropdown set to 'ft'), and 'Weight' (with a value of '55' and a unit dropdown set to 'kg'). A large blue button labeled 'Calculate BMI' is at the bottom of this section. The right section displays the results: a large green number '19.6', the classification 'Normal', and 'BMI Index: 2 / 5'. Below this, a green button indicates 'BMI Calculated', and a grey box states 'Your BMI category is "Normal"'. At the bottom of the results section, there are two buttons: 'Check Ideal Weight ->' in blue and 'View Analytics Dashboard' in white.

Data Attributes

Collect attributes: Gender, Height, Weight, and BMI data.

Data Cleaning

Remove duplicates and handle missing values effectively.

Data Transformation

Convert dataset into JSON format for frontend integration.

Data Validation

Ensure dataset accuracy and integrity before use.

Model Selection

Choose appropriate machine learning model for BMI prediction.

Feature Selection

Identify key features: height, weight, and gender data.

Model Training

Train model using labeled dataset for accurate predictions.

Prediction Output

Generate and evaluate BMI predictions based on input data.

ML Notebook

Develop and train the model using Python libraries.

Backend API

Implement Flask to serve model predictions efficiently.

JSON Data

Format processed data for seamless frontend integration.

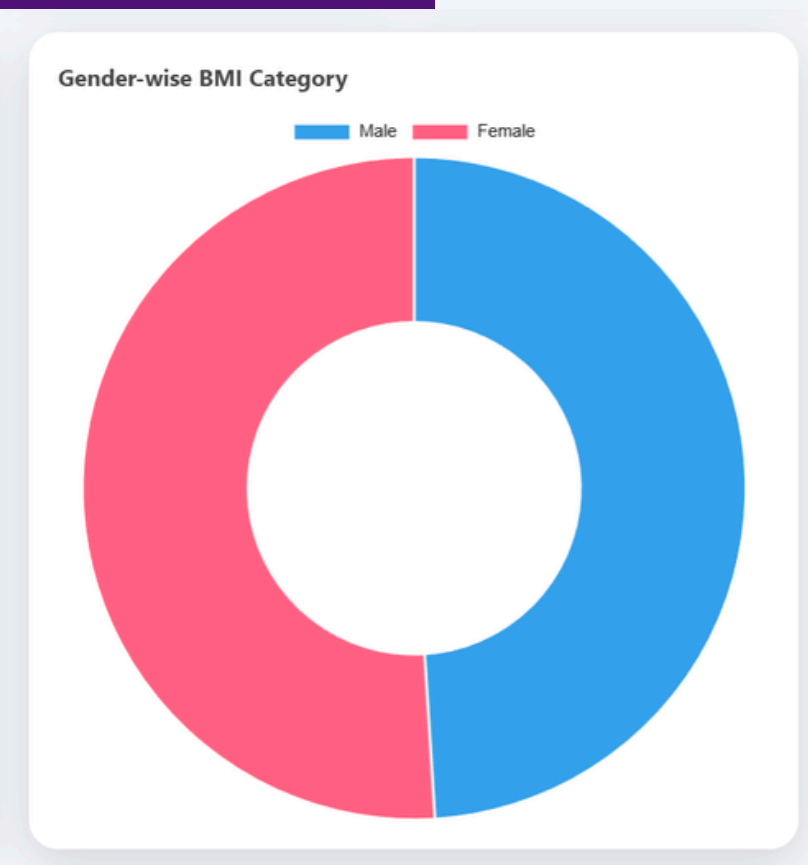
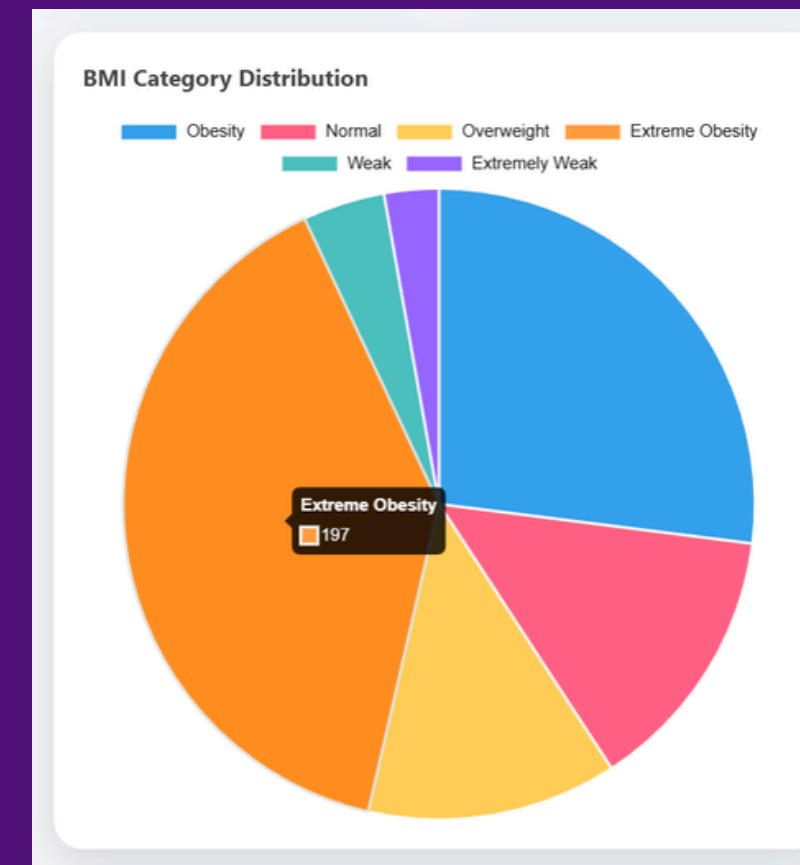
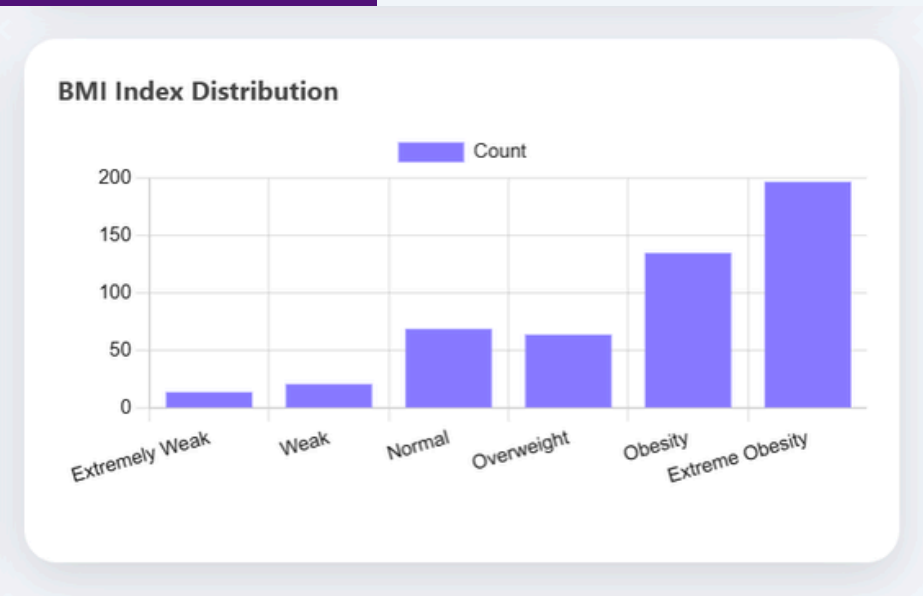
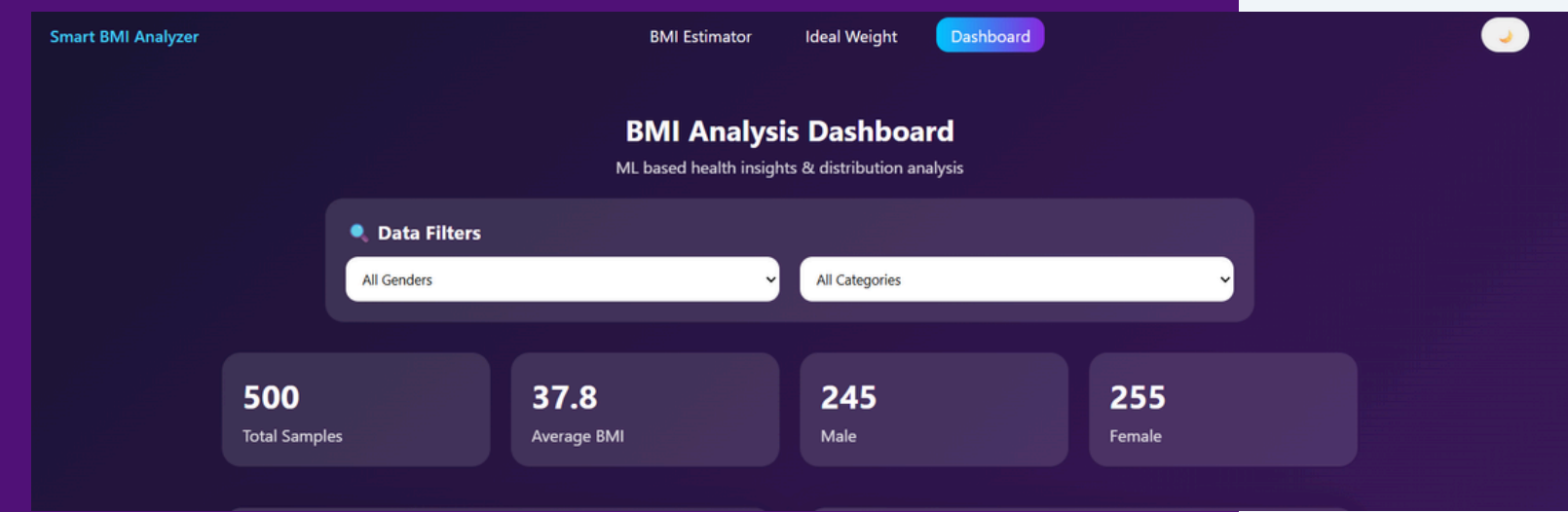
Frontend Dashboard

Create interactive UI for user-friendly BMI analysis.

Dashboard Overview

Explore the interactive BMI analysis web-based interface features

The dashboard allows users to filter data by gender and BMI category.



Data Visualization Insights

01 BMI Category Distribution

A pie chart visualizes the **distribution of BMI categories**, providing intuitive insights into population health metrics.

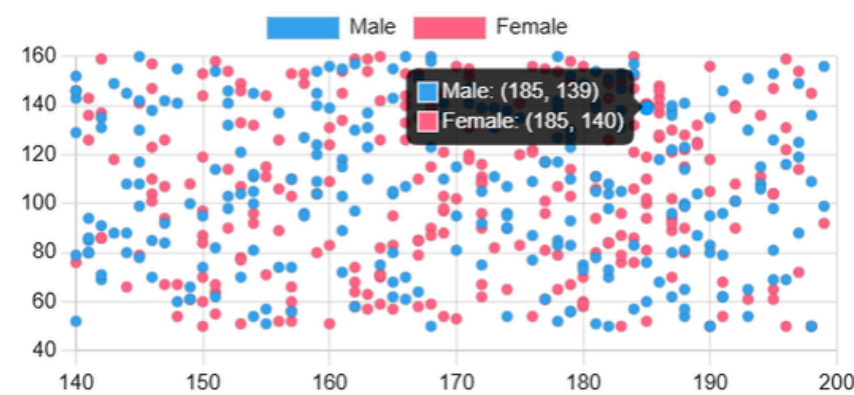
02 Gender-wise Analysis

A bar graph illustrates the **BMI comparisons** between genders, highlighting trends and differences in body mass indices.

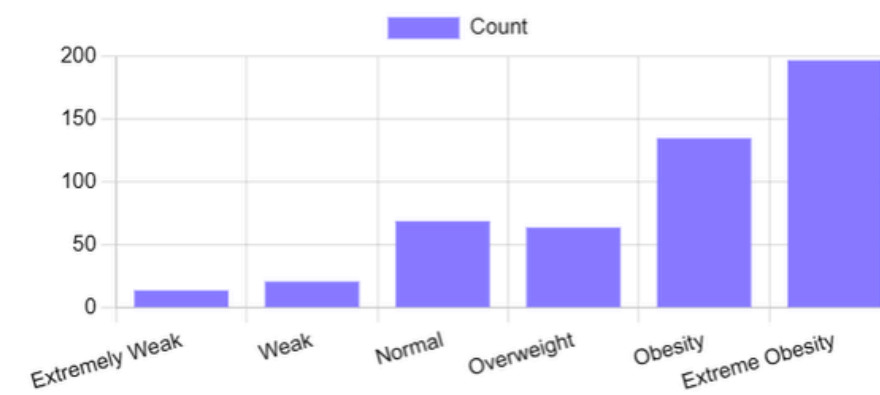
03 BMI Index Distribution

A histogram presents the **BMI index distribution**, effectively showcasing the range and frequency of BMI values within the dataset.

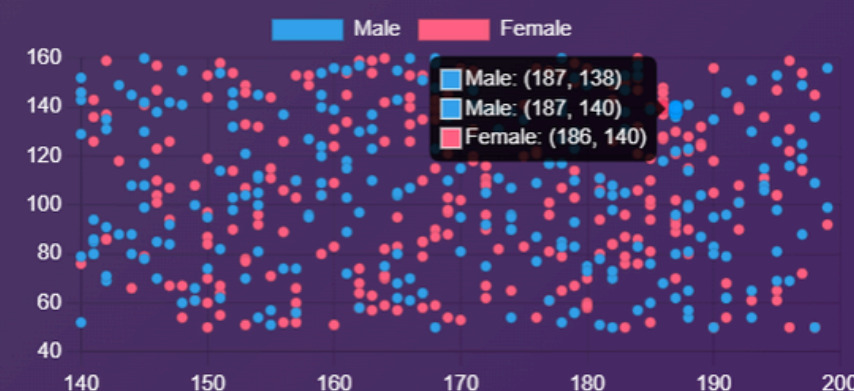
Height vs Weight Analysis



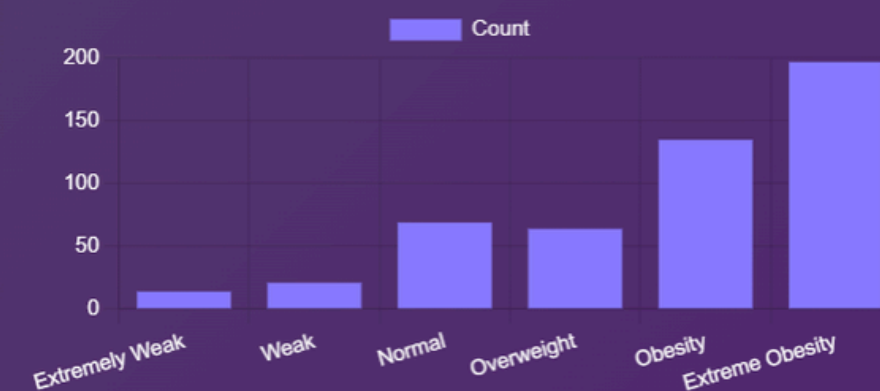
BMI Index Distribution



Height vs Weight Analysis



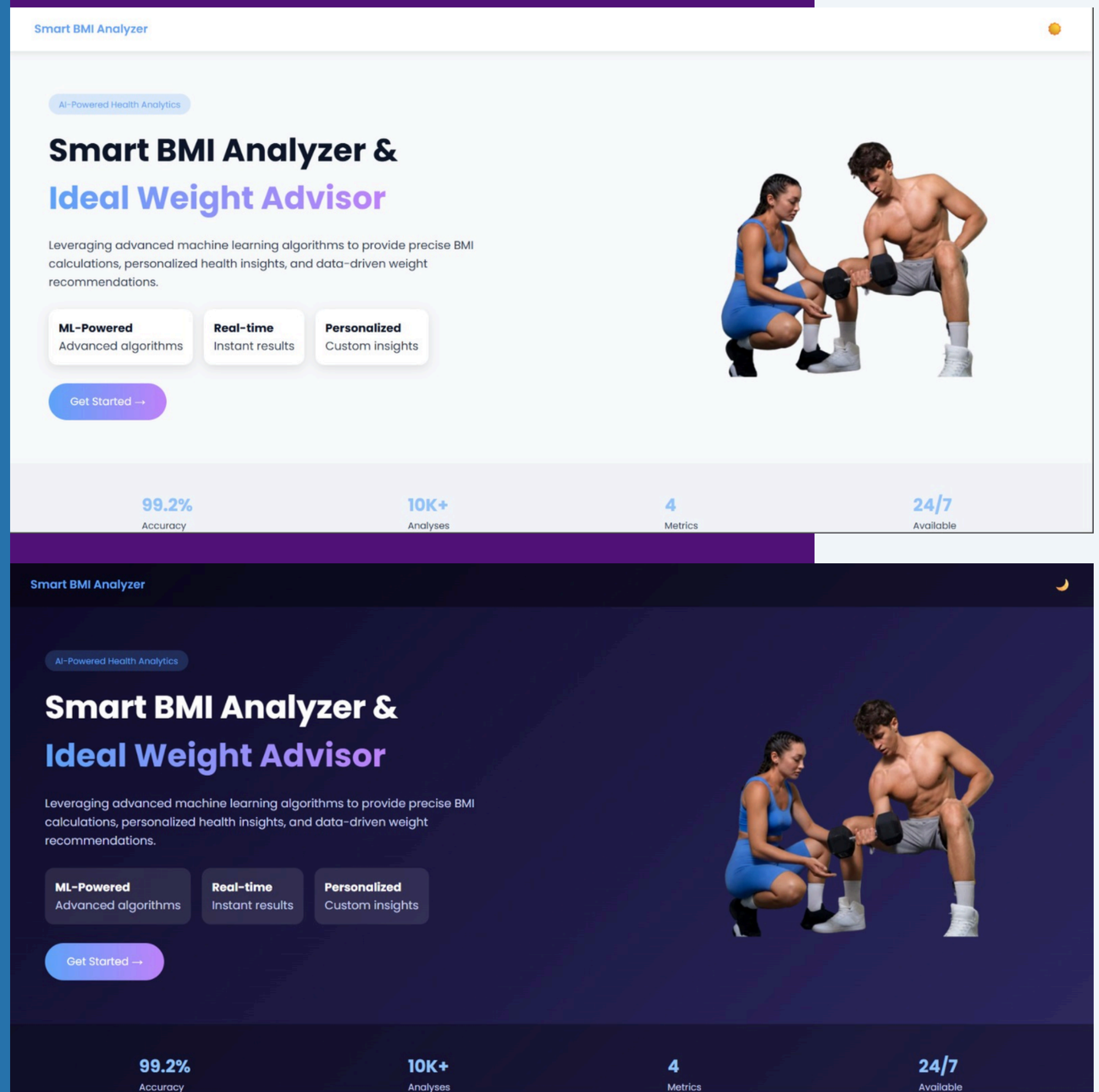
BMI Index Distribution



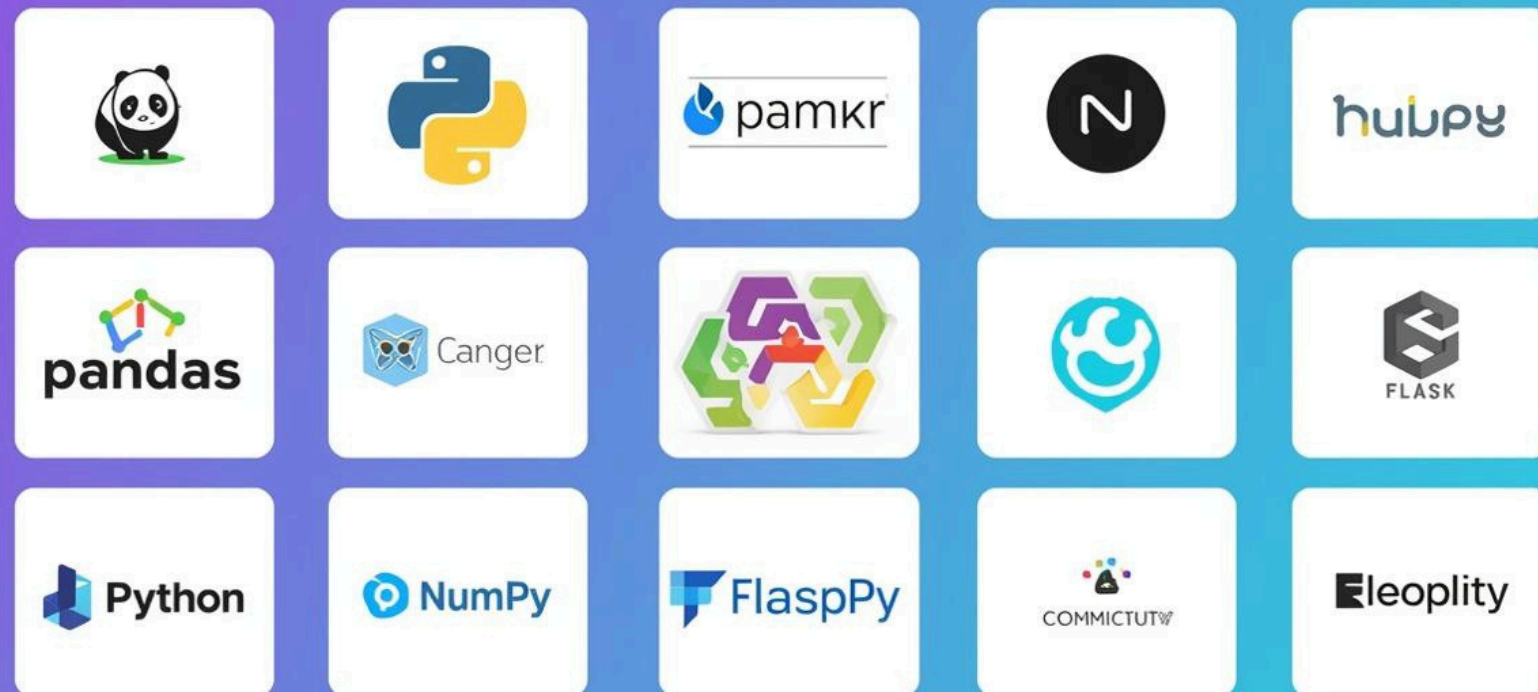
UI & UX Design

Principles and features for an engaging user experience in our dashboard

The dashboard incorporates **dark and light modes** for user preference and accessibility.



Tools & Technologies



01 Python Programming

Python is the primary programming language for machine learning and data analysis due to its simplicity and versatility.

02 Data Libraries

Libraries like Pandas and NumPy provide essential tools for data manipulation, analysis, and numerical computations.

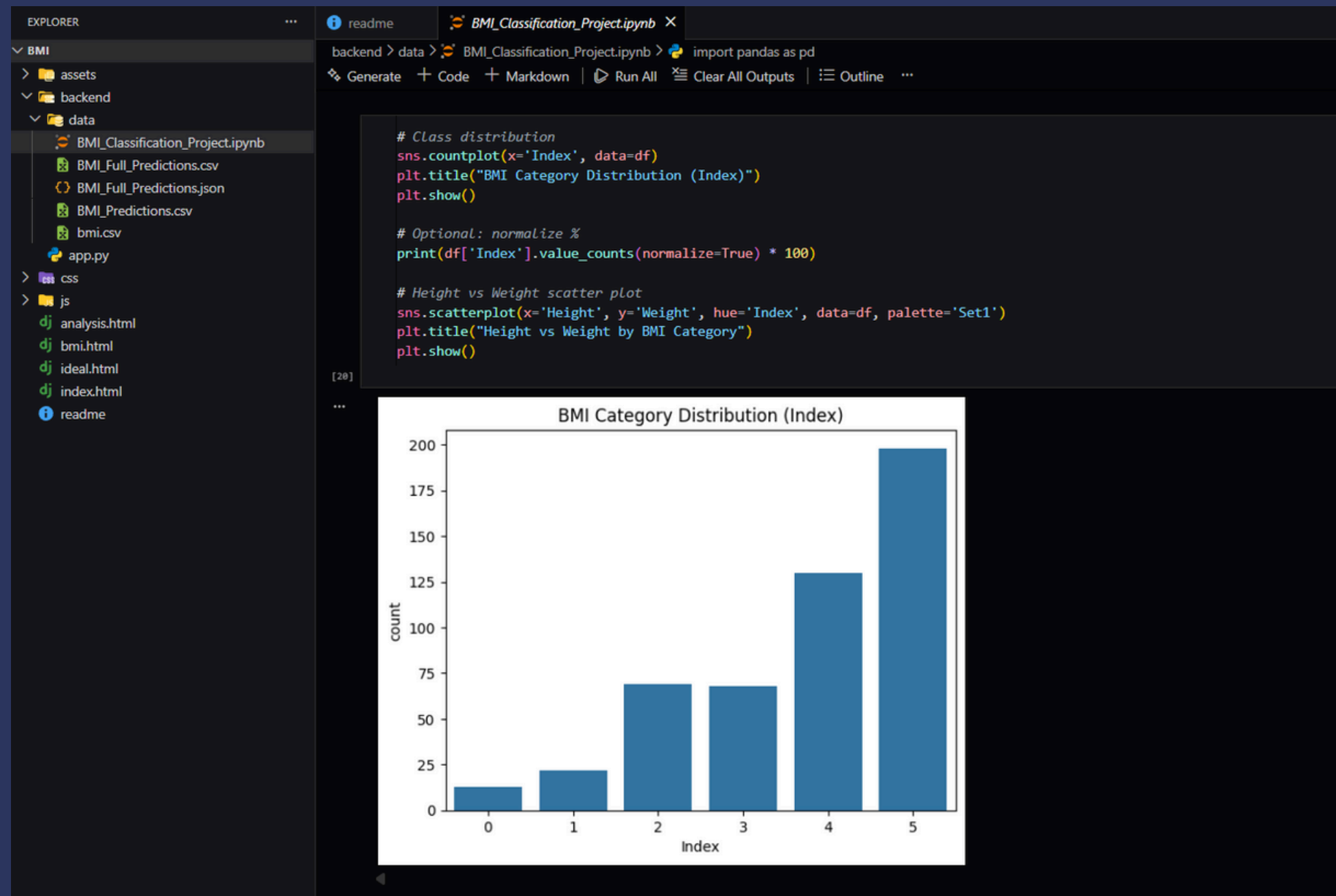
03 Web Framework

Flask is used as the backend framework to create a robust API, enabling seamless data interaction with the frontend.

Conclusion

This project estimates Body Mass Index (BMI) using Gender, Height, and Weight by applying Machine Learning and Data Visualization techniques. An interactive dashboard was developed to visualize BMI categories, gender-wise distribution, and health insights in an easy-to-understand format.

The project demonstrates the practical use of ML models, data preprocessing, and visual analytics to build a user-friendly and professional healthcare analysis system.



Thank you