AI - BASED DIET RECOMMENDER

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OUTLINE

Problem Statement
Proposed System/Solution
System Development Approach
Algorithm & Deployment
Result
Conclusion
Future Scope
References

PROBLEM STATEMENT

In the modern era, individuals often struggle to maintain a balanced and healthy diet due to a lack of awareness, time, and access to personalized nutritional guidance.

Most existing diet plans are generic and fail to consider key personal factors such as age, weight, height, gender, and daily activity levels.

This one-size-fits-all approach leads to ineffective results and reduced motivation to follow dietary routines. There is a growing need for accessible systems that understand and adapt to individual health profiles.

PROPOSED SOLUTION

The proposed system is a web-based AI-powered Diet Recommender that provides personalized diet suggestions based on individual user input. By collecting parameters such as age, weight, height, gender, and lifestyle, the system calculates BMI, BMR, and daily calorie requirements using rule-based logic. Additionally, it uses a machine learning model (Decision Tree Classifier) trained on dietary patterns to predict the most suitable diet type.

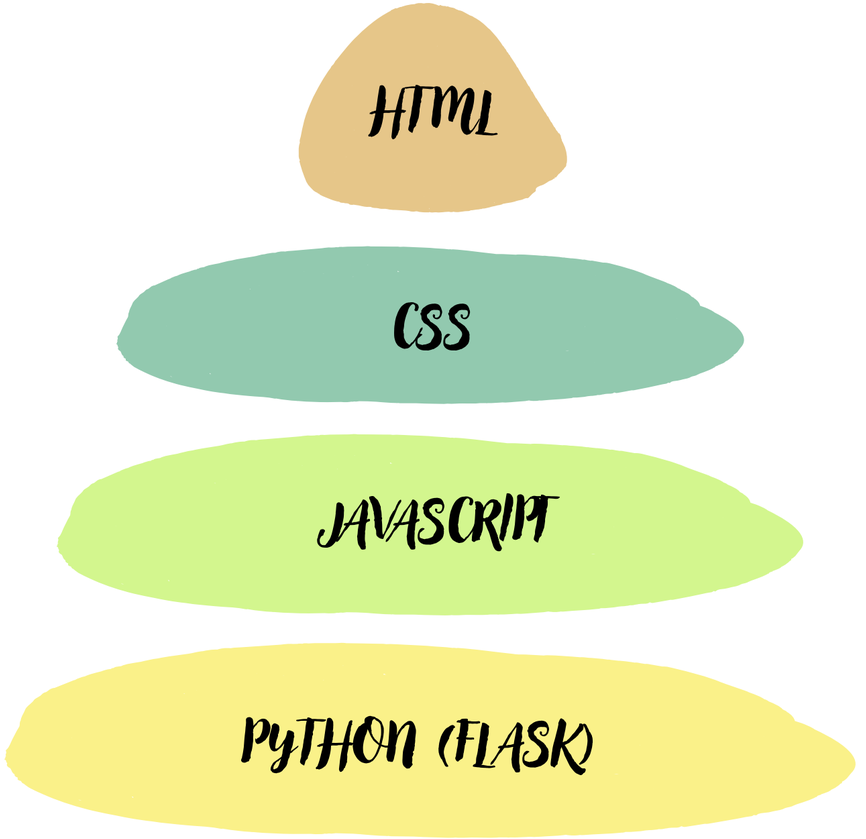
The solution features a clean and interactive web interface built with HTML, CSS, and JavaScript, while the backend prediction logic is implemented using Python (Flask). It allows real-time recommendations and displays results in a visually appealing format. An optional OCR module is also integrated to extract nutrition details from food labels.

HTML

Builds the structure of the webpage

CSS

Adds styling and layout



Handles interactivity and input checks

JAVASCRIPT

Runs the AI logic and connects the front-end and back-end

PYTHON

SYSTEM APPROACH

COMPONENT	TOOLS/TECHNOLOGIES	PURPOSE
Frontend	HTML, CSS, JavaScript for building the user interface	Responsive form to collect user input (age, weight, height, gender, lifestyle)
Backend	Python for logic and model integration	Flask web framework to create REST APIs and connect frontend with backend
Machine Learning	○ scikit-learn for training and predicting diet type using a Decision Tree Classifier ○ pandas for data manipulation and preprocessing	LabelEncoder and train_test_split for encoding and splitting dataset
Optional OCR Integration	pytesseract to extract nutrition facts from food label images	Pillow (PIL) for image handling
Development Tools	○ Visual Studio Code as the code editor ○ Postman for API testing	Browser for live UI testing
Local Environment	Python virtual environment (venv) for isolated package management	Runs locally at http://localhost:5000

ALGORITHM & DEPLOYMENT

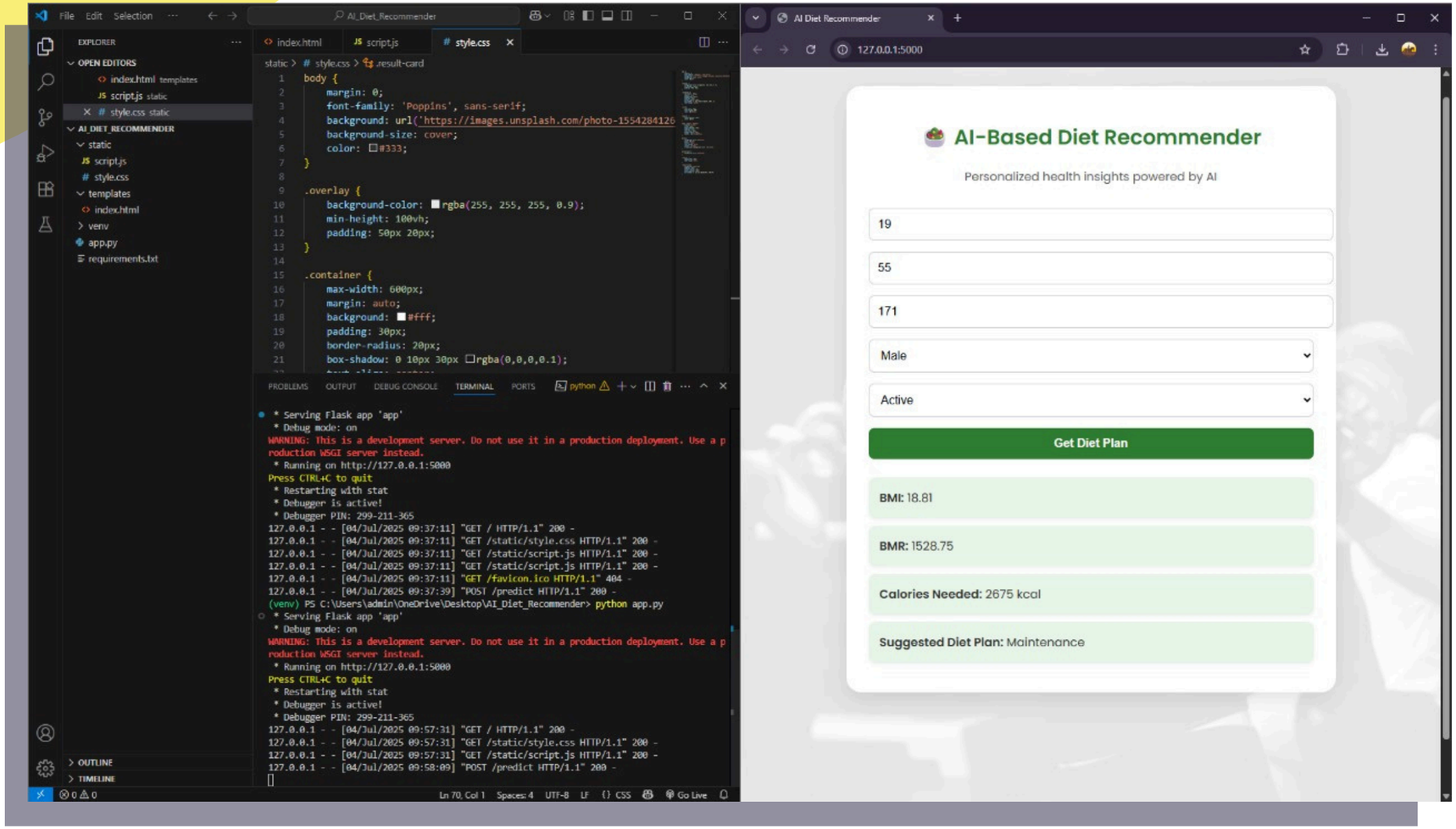
Algorithm Selection: The system uses a Decision Tree Classifier from the scikit-learn library due to its simplicity, efficiency, and suitability for structured health-related data.

Data Input: Users provide inputs such as age, weight, height, gender, and lifestyle. Additional features like BMI, BMR, and calorie requirements are calculated using rule-based formulas to enrich the input for the model.

Training Process: A labeled dataset in CSV format is used, with categorical values encoded using LabelEncoder. The data is split into training and testing sets using an 80:20 ratio. The model learns to classify input profiles into diet categories such as Weight Loss, Maintenance, or Weight Gain.

Prediction Process: When a user submits their data through the frontend, it is sent to the backend via a POST request. The backend processes the input, calculates necessary metrics, and feeds it into the trained model, which returns the predicted diet type. The result is then displayed dynamically on the frontend.

RESULT



The system successfully calculates and displays personalized health metrics including **BMI (Body Mass Index), BMR (Basal Metabolic Rate), and daily calorie requirements based on user input.** It then predicts the most suitable diet plan category — Weight Loss, Maintenance, or Weight Gain — using a trained Machine Learning model. The output is presented in a user-friendly web interface with styled result cards, offering a clear and accessible experience for end-users.

CONCLUSION

The AI-Based Diet Recommender project demonstrates how artificial intelligence and basic health metrics can be combined to offer personalized diet suggestions. By calculating BMI, BMR, and calorie needs, and applying a machine learning model, the system provides tailored dietary advice in real time. The integration of a user-friendly interface with predictive intelligence makes it accessible and practical for daily use. This solution not only enhances nutritional awareness but also promotes healthy lifestyle choices through data-driven recommendations.

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REFERENCES

- scikit-learn Documentation – For implementing the Decision Tree Classifier
- Flask Framework – For building the backend web server
- Python Official Documentation – For general language reference and standard libraries
- WHO Guidelines – For BMI and BMR calculation formulas
- Tesseract OCR GitHub – (Optional) For extracting nutrition from food labels
- Visual Studio Code – Used as the development environment
- Dataset: Custom-created CSV based on standard BMI/BMR use cases
- Github Link

THANK YOU!