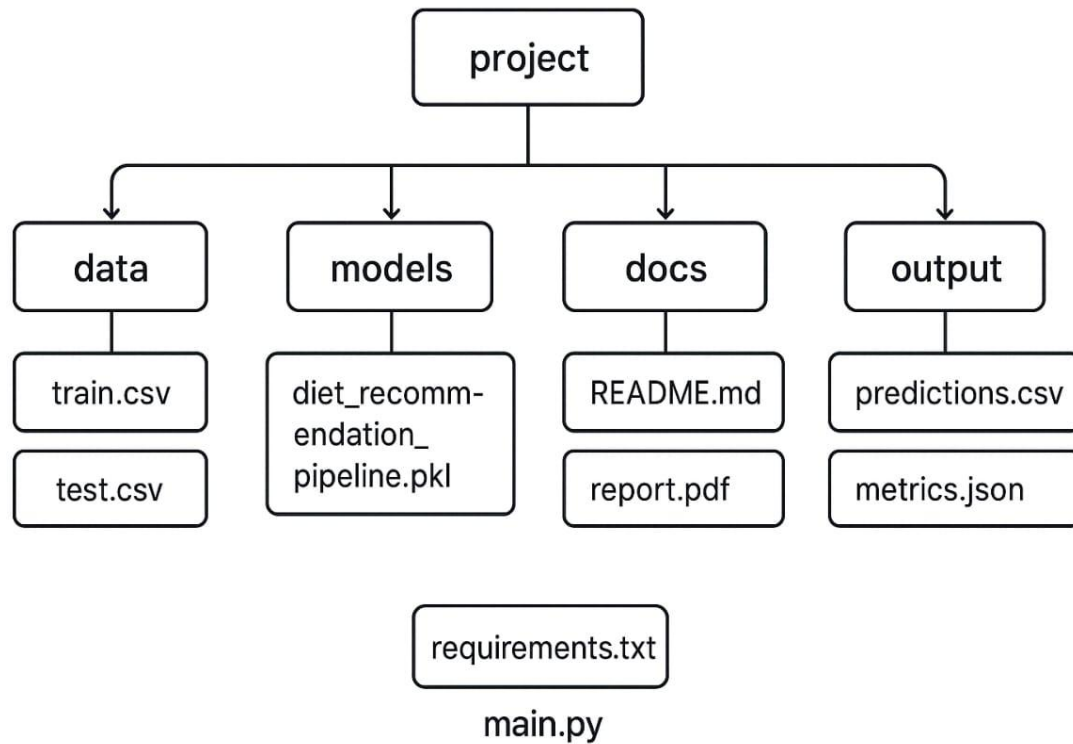**README – Personalized Diet Recommendation System**

1. Overview

This project implements a **Personalized Diet Recommendation System** using **XGBoost**.
It predicts the **best meal plan** for an individual based on their **health, lifestyle, and nutritional data**.

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2. Project Structure


```
                            project

        data         models          docs          output

       train.csv    diet_recomm-    README.md     predictions.csv
                    endation_
       test.csv     pipeline.pkl    report.pdf    metrics.json


                        requirements.txt

                            main.py
```

---

3. Setup

Install dependencies:

pip install -r requirements.txt

Requirements file includes:

pandas==2.0.0

numpy==1.24.0

scikit-learn==1.2.0

xgboost==1.7.0

joblib==1.2.0

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4. Usage

Training the model:

python main.py –train

Making predictions:

from predictor import predict_new

```
patient_data = {

    'Age': 30,

    'Gender': 'Male',

    'Height_cm': 175,

    'Weight_kg': 70,

    'BMI': 22.86,

    'Chronic_Disease': 'None',

    'Daily_Steps': 8000,

    'Preferred_Cuisine': 'Indian',

    # Add remaining fields...

}


result = predict_new(patient_data)

print("Top Recommended Meal Plan:", result)
```

---

5. Dataset

Features include:

- Demographics (Age, Gender, Height, Weight, BMI)

- Medical details (Chronic Diseases, Blood Pressure, Cholesterol, Blood Sugar)

- Lifestyle habits (Steps, Exercise Frequency, Sleep Hours, Alcohol & Smoking habits)

- Nutrition intake (Calories, Protein, Carbs, Fats)

- Food preferences & allergies

Target: Recommended_Meal_Plan (multi-class label)

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6. Model

- **Algorithm:** XGBoost (multi-class classification)
- **Evaluation Metrics:**
    - Accuracy
    - Mean Average Precision (mAP)
- **Validation Results (Example run):**
    - Accuracy: ~87.4%
    - mAP: ~88.5%

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7. Deliverables

- Trained model (.pkl)
- Preprocessing pipeline (encoders, column order)
- Sample predictions
- Metrics log
- Full project report (report.pdf)