

AI-POWERED PERSONALIZED DIET PLANNING

Foundations and Application of Generative Al

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Front-End Developer MMDT

Front-End & Back-End Developer

MMDT

Database Developer

MMDT

ZULAL OZGE KUS

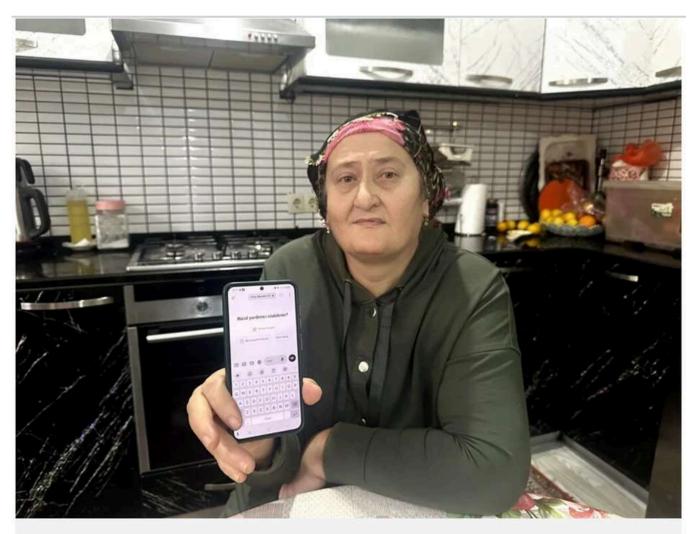
UX Designer

MMDT

CHAN R. SURENDRA
UX Designer & User Tester
MMDT

Tired of having to worry about food, the mother left the task to Chat GPT: There is broccoli, what should I do?

Artificial intelligence has begun to take on the role of a helper in the kitchen, especially by women. Emine Kurt, a mother of 6 from Rize, solved the question of "What am I going to cook today?" that most women face with artificial intelligence (Chat GPT). Kurt said, "I tell it the ingredients in my cupboard and it gives me meal suggestions."



Emine Kurt, 59, living in Rize, got rid of her indecisiveness about cooking thanks to the artificial intelligence she met through her daughter. Emine Kurt, who talks to the artificial intelligence vocally, tells the artificial intelligence the ingredients in her fridge, and the artificial intelligence makes meal suggestions.

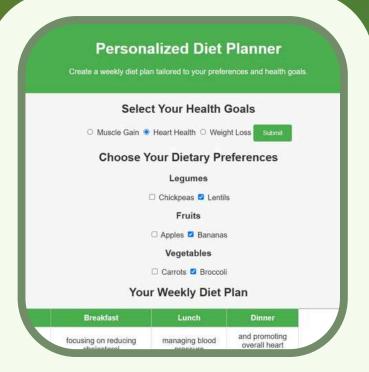
DIETCRAFT VISION

Objective: To create a secure and personalized dietary planning platform using AI, ensuring user needs are met with safety and accuracy.

Impact:

- User-Friendly Interface: Collect user information effortlessly through an intuitive design.
- Personalized Weekly Diet Plans: Deliver tailored dietary recommendations based on user preferences and health requirements.
- Customizable Meals: Enable users to modify their plans via a chatbot or a dislike button to fine-tune meal options.
- Health Tips: Provide personalized nutritional advice to support users in achieving their dietary goals.
- PDF Export: Allow users to download their weekly diet plans & tips in a professional PDF format for convenience.
- **Meal History Tracking:** Offer users the ability to revisit and compare their weekly plans for consistency and improvement.
- Image-Based Meal Customization: Personalize recipes by analyzing uploaded images of the user's fridge contents to suggest relevant dishes.





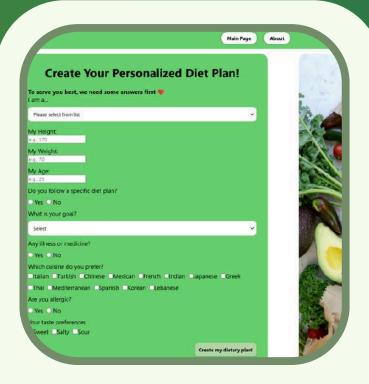
1st Phase

- Define project goals and vision.
- Outline actionable steps.
- Assign tasks to team members.
- Create initial UI prototypes.
- Develop API integration strategy.
- Set up database configuration.



2nd Phase

- Design user flows and prototypes in Figma.
- Build Output and Info Pages.
- Code UI designs.
- Integrate navigation functions.
- Update user input fields and prompt logic.



3rd Phase

- Add PDF Export functionality.
- Conduct initial user testing. Refine features based on feedback.
- Add Tips Section for personalized advice.
- Implement Thumbs Down and Chatbot features.
- Enhance prompt to support new functionalities.



4rd Phase

- Build Login Page and connect database.
- Add Image Upload for mealbased suggestions.
- Optimize UI for performance and responsiveness.
- Conduct more user test
- Enhance prompt for security against jailbreak attempts.



CODE STRUCTURE



1. Frontend (React, JavaScript, CSS)



User Interface:

- Collects user input through forms ->
- (e.g., gender, dietary preferences, allergies).
 - Displays a personalized diet plan & tips dynamically generated based on user input.
 - Features include a **chatbot** (**feedback**), **PDF export**, **image upload** for fridge content integration.

API Integration:

- Connects directly to the **OpenAl API** to fetch personalized meal plans.
- Processes user input and **sanitizes** it to ensure safe API communication by detecting and removing potentially harmful commands (e.g., "**jailbreak**")
- Updates the displayed meal plan in real-time based on user interactions (e.g., dislikes, preferences).

2. Backend (Node.js, Express.js, Axios)





API Management:

• Handles requests for analyzing fridge contents.

AI Model Integration (OpenAI GPT-40 & GPT-3.5 Turbo):

• Fridge Analysis: Processes uploaded images using the OpenAl Vision API (gpt-40 model) to detect and return a list of food items.

Error Handling:

- Validates image uploads and returns error messages if no file is provided.
- Uses environment variables (.env) to securely manage sensitive information such as API keys.
- Logs API errors and handles failed requests by returning appropriate error responses to the client.





System Prompt:

You are an AI that specializes in generating highly personalized weekly diet plans based on user input. Your goal is to create a detailed and structured meal plan that adheres to user preferences, goals, and dietary constraints.

Instructions for the Model:

- Use the provided user data, such as Gender, Height, Weight, Age, Goal, Allergies, Taste Preferences, and Disliked Meals.
- If available, analyze the user's fridge contents and incorporate detected ingredients into the meal plan.
- Replace any ingredients the user is allergic to with safe alternatives (e.g., replace "apples" with "pears").

- Ensure that meals follow this exact format:
 - o Day | Meal | Details
 - Example:
 - Monday | Breakfast | Oatmeal with almond milk and berries
 - Monday | Lunch | Grilled chicken with quinoa and salad

- Strictly exclude allergens (e.g., peanuts).
- Do not include phrases like "Alternative to...". Instead, directly replace the specified meal.
- Generate a diet plan covering Breakfast, Morning Snack, Lunch, Afternoon Snack, and Dinner for each day.
- Use the fridge items as primary ingredients if available. Suggest alternatives if they are insufficient for a full meal.





Creating an Al Persona

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Instructions for the Model:

ingredients into the meal plan.

- Use the provided user data, Defining Clear Goals & Objectives
- Allergies, Taste Preferences, and Disliked Meals. • If available, analyze the user's fridge contents and incorporate detected
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Error Handling & Safety Constraints

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Providing Output Format Examples



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 - Example:
 - Monday | Breakfast | Oat Including Constraints and Rules
 - Monday | Lunch | Grilled chicken with quinou and said

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System Prompt:

You are an AI that provides highly personalized health and nutrition tips based on user input and available ingredients. Your goal is to generate up to 10 practical and actionable tips that align with the user's dietary needs, preferences, and health goals.

Instructions for the Model:

- Use the provided user data, such as Gender, Height, Weight, Age, Goal, Specific Diet Plan, Illness, Cuisines, Allergies, and Taste Preferences.
- Incorporate available ingredients detected from the fridge into the recommendations.
- Provide practical, short, and easy-to-understand suggestions.

• Example:

- I noticed that you have carrots, eggs, and milk in your fridge. Based on these
 ingredients, I have suggested meals that align with your dietary preferences.
 However, you may still need to buy additional ingredients such as essential spices,
 fresh vegetables, or protein sources to complete your meals.
- o Drink at least 2 liters of water daily to stay hydrated.
- Increase your intake of Vitamin D by spending time in natural sunlight or consuming fortified foods.
- o Include more lean protein (e.g., grilled chicken, tofu) in your diet to help with muscle building.

Recommendations should include:

- Daily calorie intake and macronutrient breakdown (carbohydrates, protein, fat).
- Suggested intake of key vitamins (e.g., Vitamin D, Vitamin C, Iron) and minerals (e.g., Calcium, Magnesium).
- o Practical meal suggestions based on available fridge ingredients.
- Physical activity or lifestyle advice tailored to the user's goals.
- Hydration advice tailored to weight, age, and activity level.





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Including Constraints and Rules

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Providing Output Format Examples

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Advanced Prompt Guidance

• Recommendations should include:

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- Practical meal suggestions based on available fridge ingredients.
- Physical activity or lifestyle advice tailored to the user's goals.
- Hydration advice tailored to weight, age, and activity level.



PROMPT DESIGN | MODIFY THE WEEKLY PLAN



System Prompt:

You are an AI that modifies a weekly diet plan based on user feedback. Your goal is to adjust the plan according to updates provided by the user while keeping all other meals unchanged.

Instructions for the Model:

- Use the user data, such as Gender, Height, Weight, Age, Goal, Allergies, Taste Preferences, and Disliked Meals.
- Incorporate the user's feedback to modify only the meals explicitly mentioned.
- Use the provided meal plan as a reference and retain any meals not mentioned in the feedback.

• Example User Input:

I don't like the Tuesday lunch: "Grilled chicken with quinoa and salad."
 Please replace it with a vegetarian option.

• Example Output:

- Monday | Breakfast | Oatmeal with almond milk and berries
- Tuesday | Lunch | Grilled tofu with mixed greens and quinoa

- Modify only the specified meals.
- Strictly exclude any allergens (e.g., replace apples with non-allergenic fruits like pears).
- Do not include phrases like "Alternative to...". Directly replace the meal with the new suggestion.
- Ensure each day has a full meal structure: Breakfast, Morning Snack, Lunch, Afternoon Snack, and Dinner.



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Providing User Input Example

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PROMPT DESIGN | FRIDGE ANALYSIS



System Prompt:

You are an Al assistant that analyzes images of fridge contents. Your goal is to identify and provide a list of the detected food items based on the uploaded image.

Instructions for the Model:

- The user uploads an image of their fridge.
- Extract the image content and identify the food items present.
- Return only the names of the food items as a structured list.

• Example User Input:

 What food items are in this image? Provide a list. (Image: (data:image/jpeg;base64...))

• Example Output:

o Detected Items: 1. Eggs 2. Carrots 3. Milk 4. Cheese 5. Broccoli

- Ensure that only valid food items are detected and listed.
- The output must strictly consist of food names without additional descriptions.
- Handle errors gracefully, such as when no image is uploaded or when no recognizable items are detected.



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Contextual Image Processing

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Providing Output Format Examples



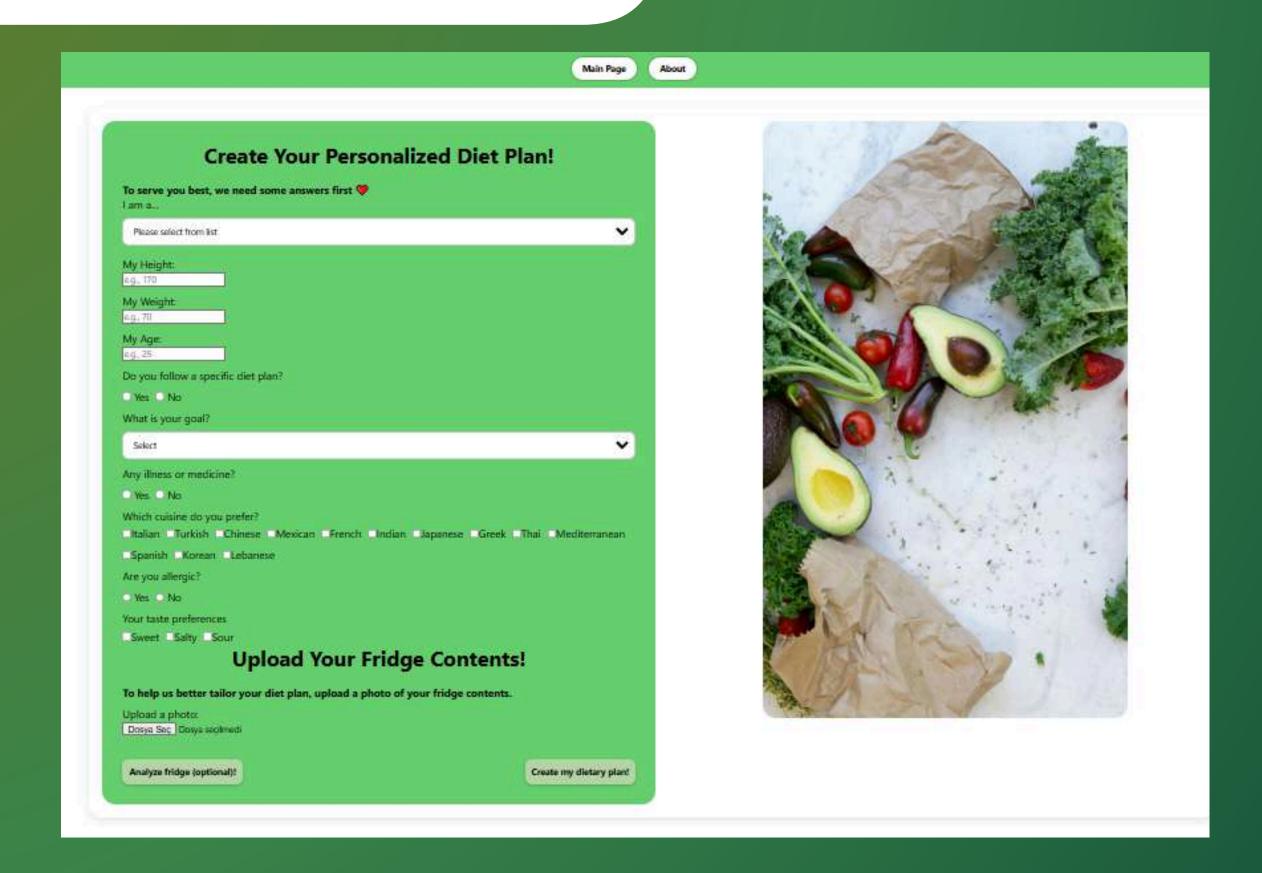
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- Important Notes

Ensuring Valid and Accurate Detection

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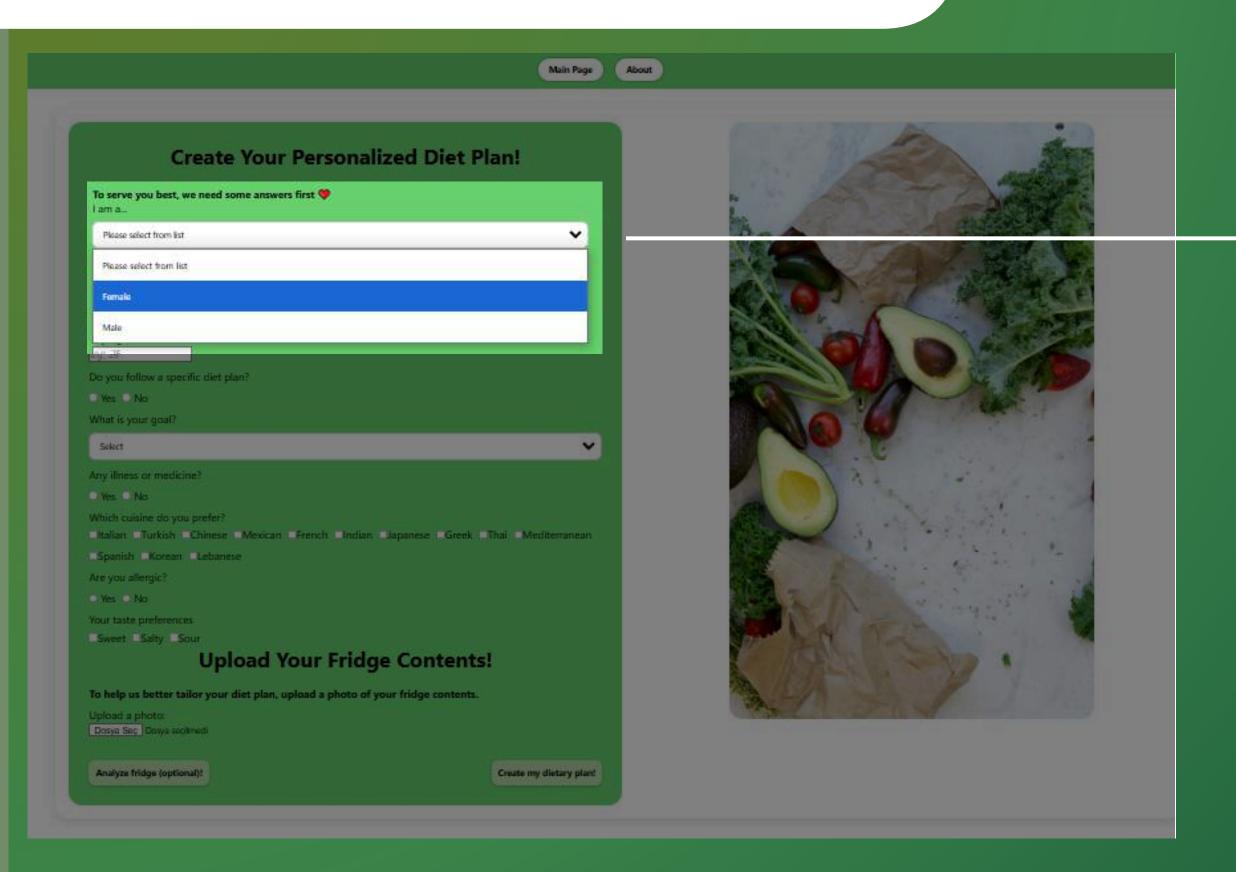
Structured Output Consistency

HOME PAGE All features

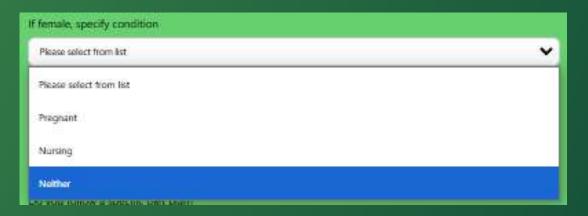


HOME PAGE

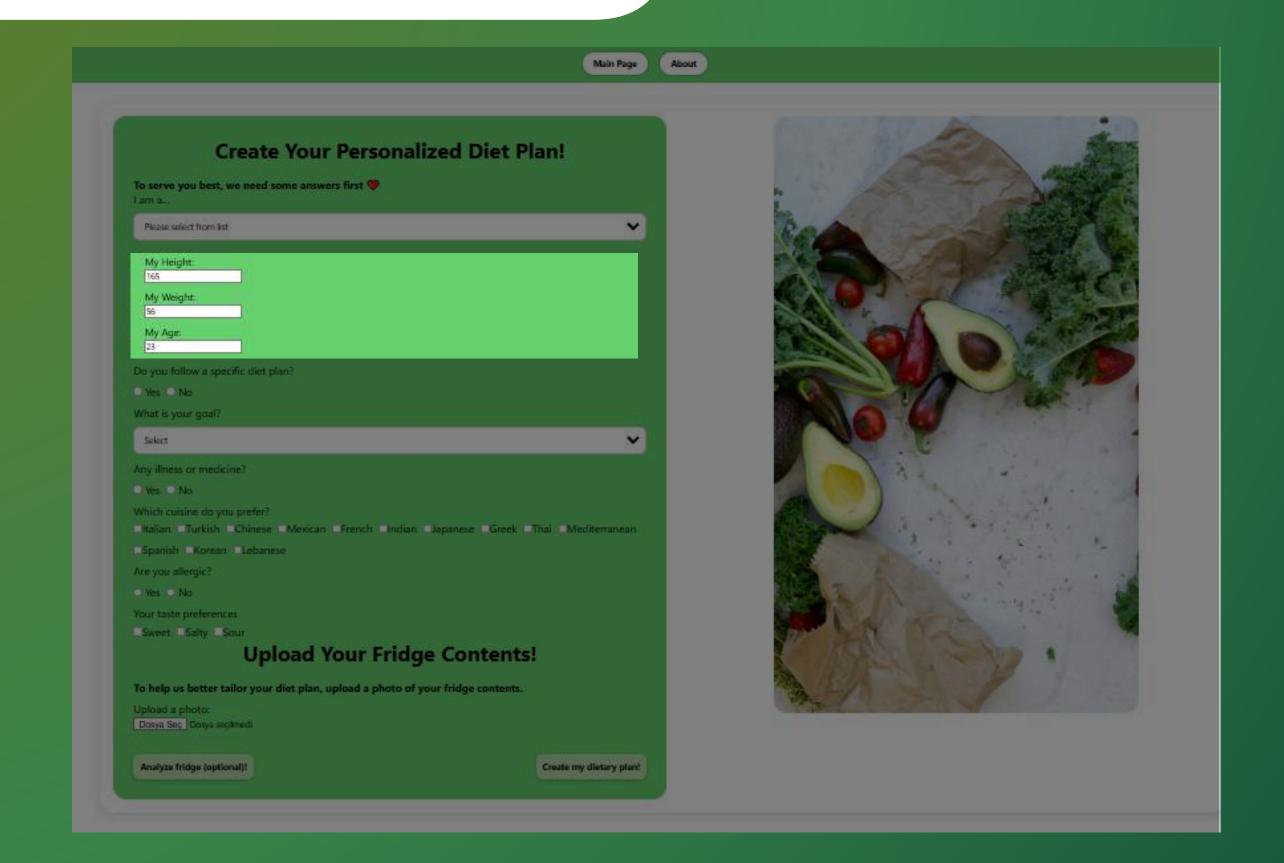
Gender



If user chooses female, another question appears in form:

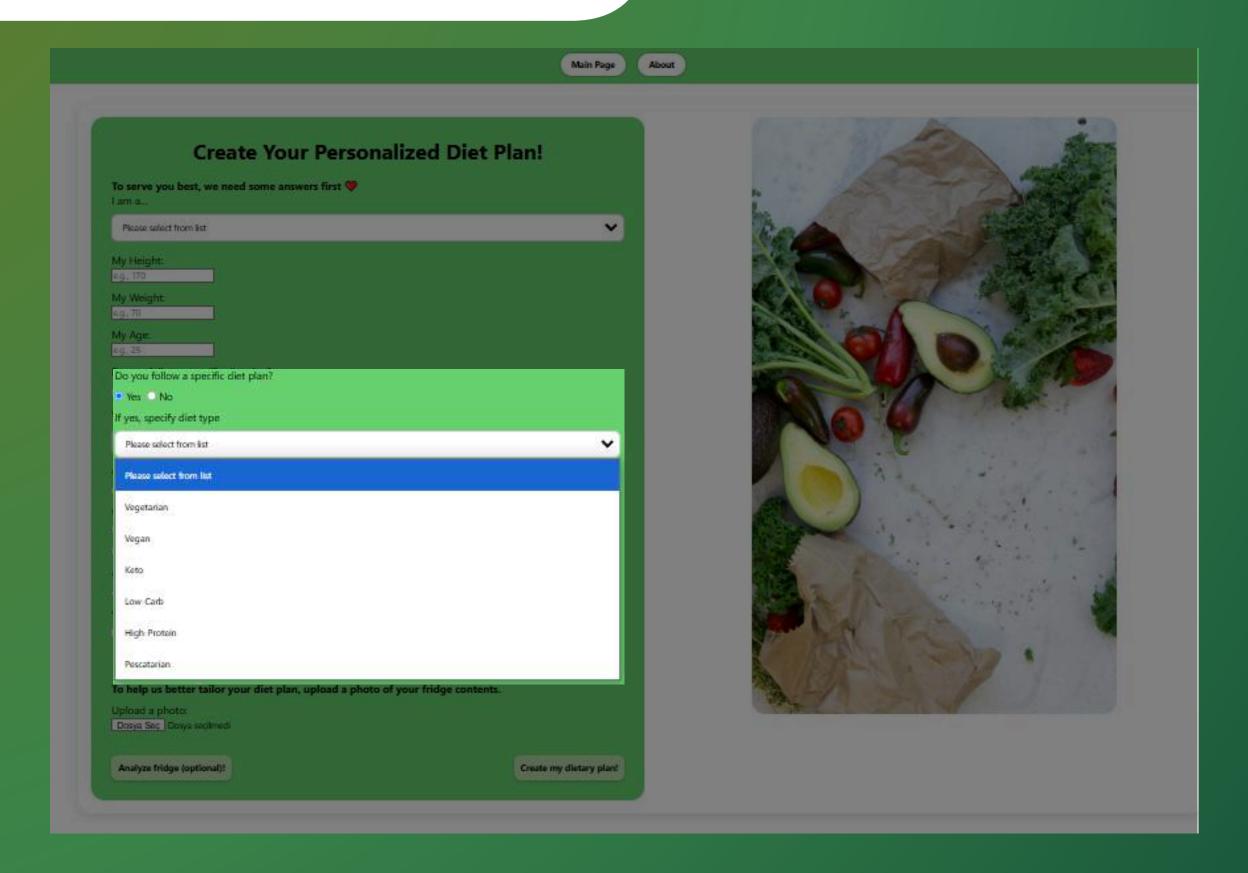






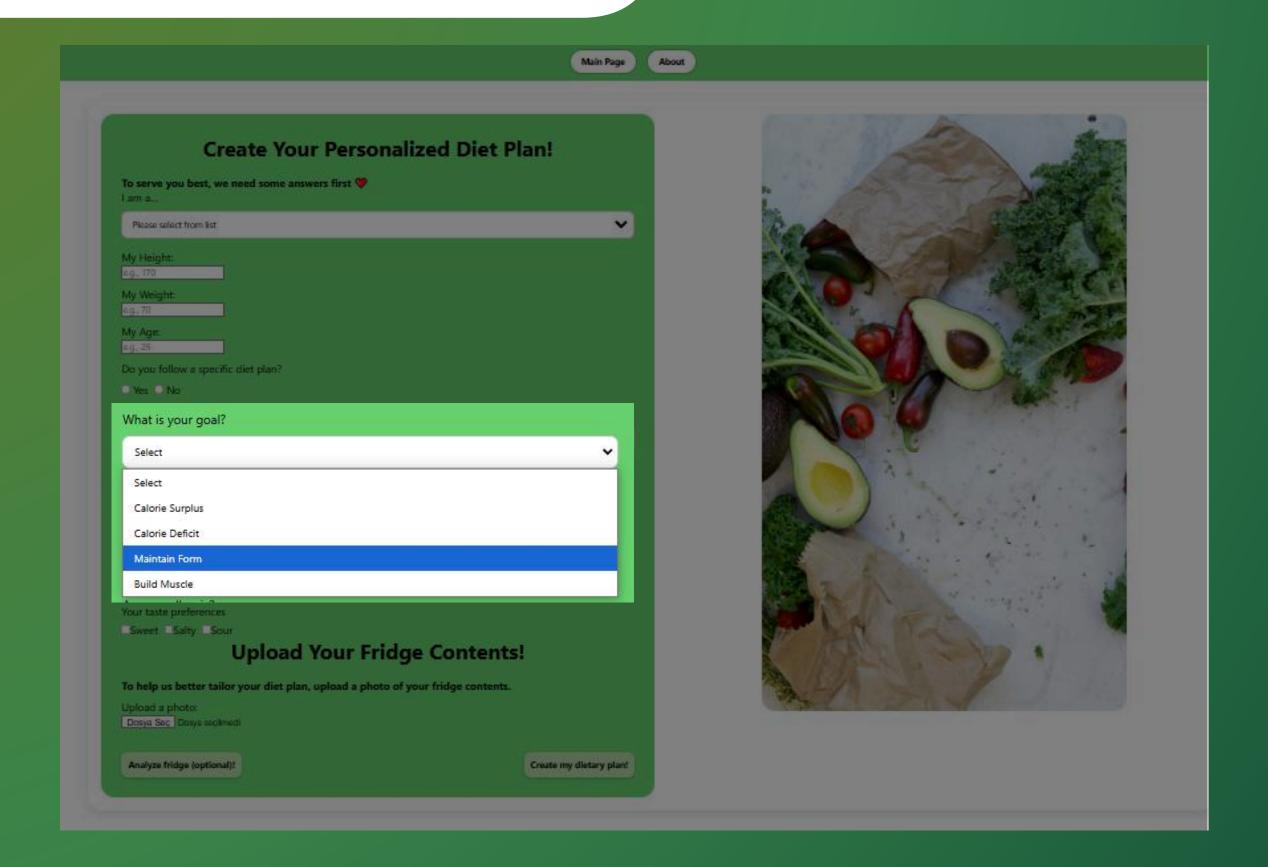


Specific Diet Plan

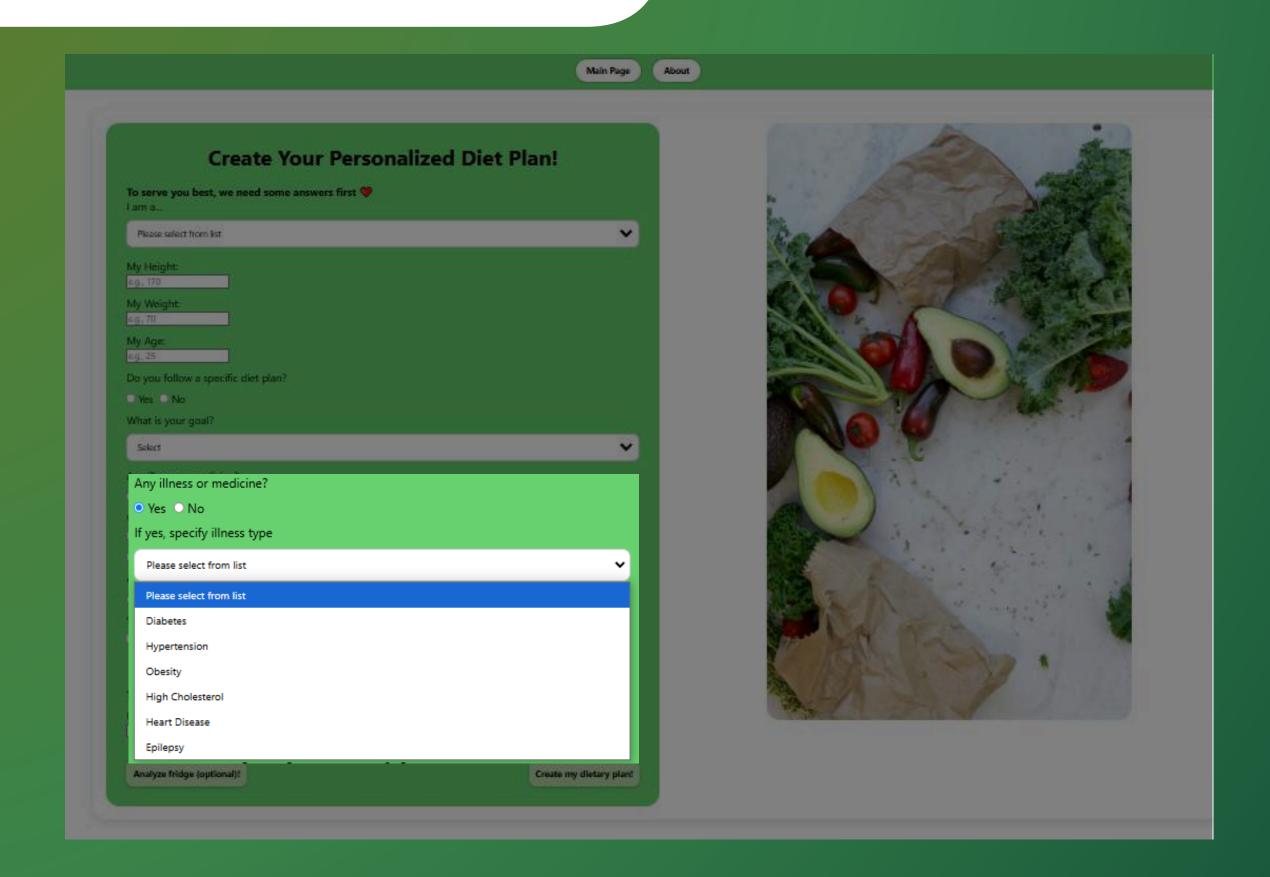




Users Goal

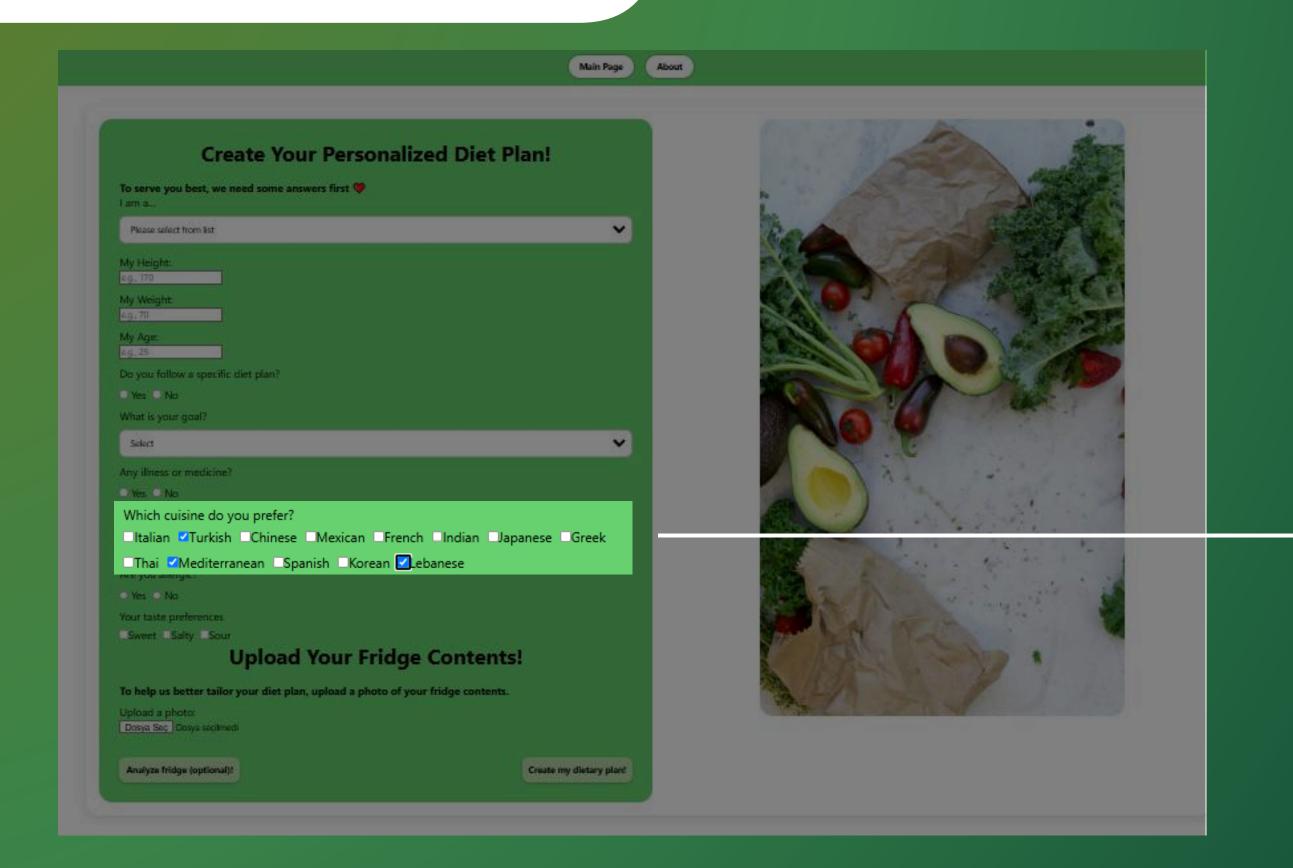




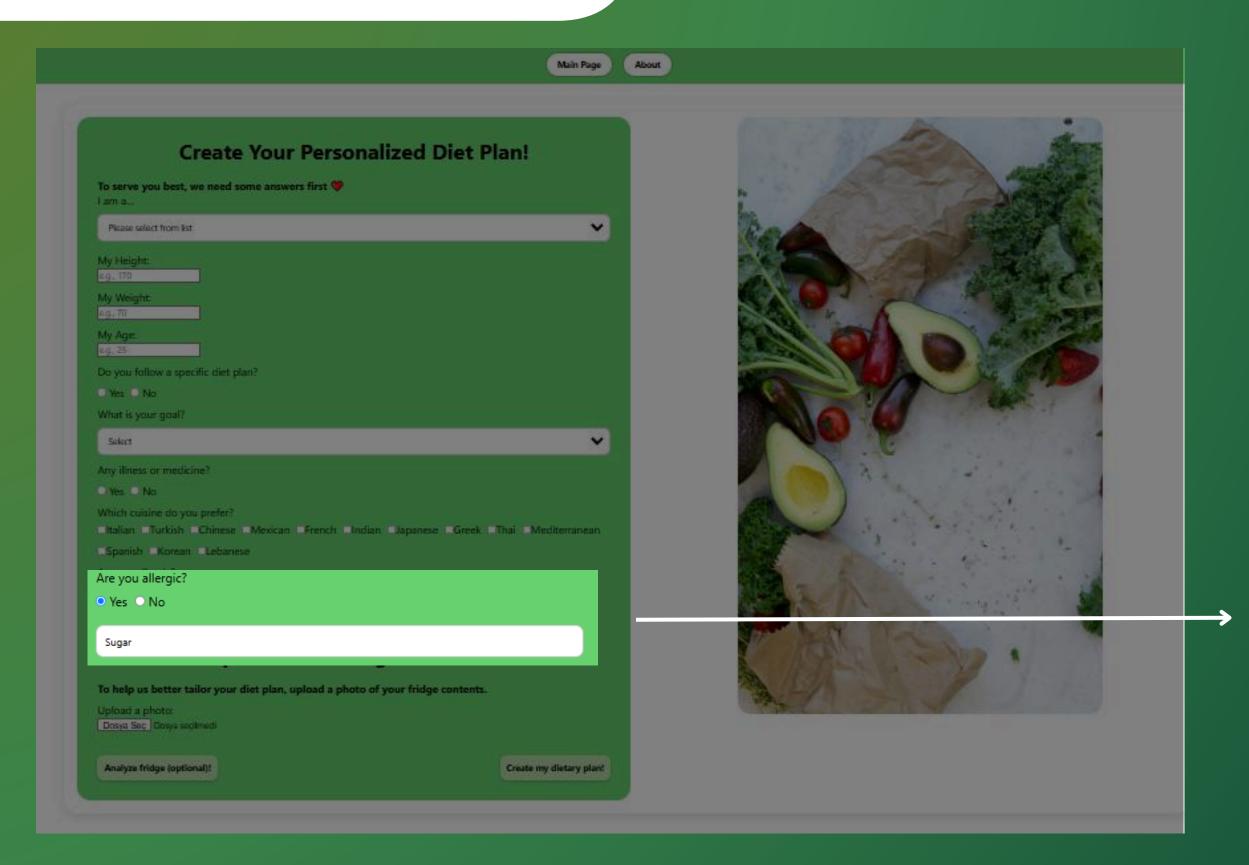




Cuisine Preferences



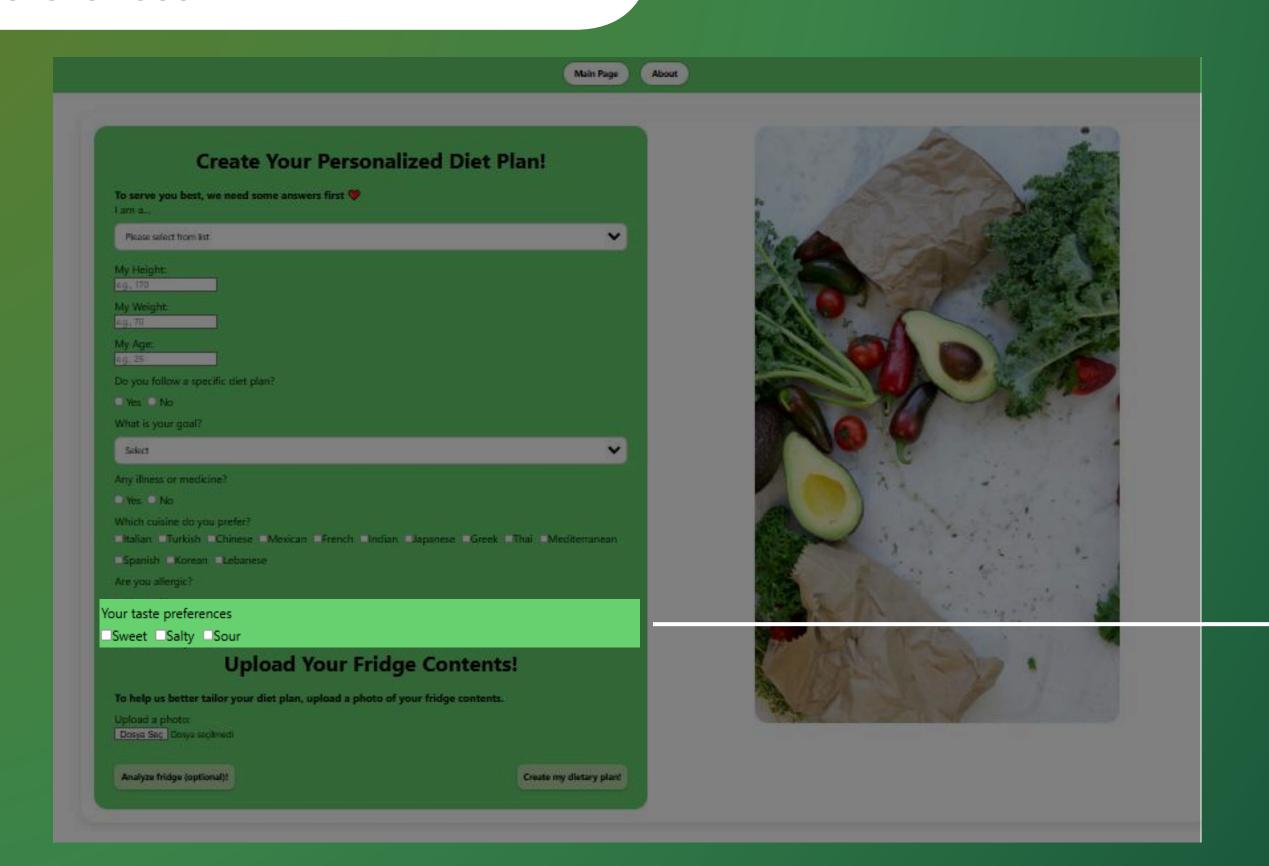
Multiple choice



The user should write here the product to which he/she is allergic.



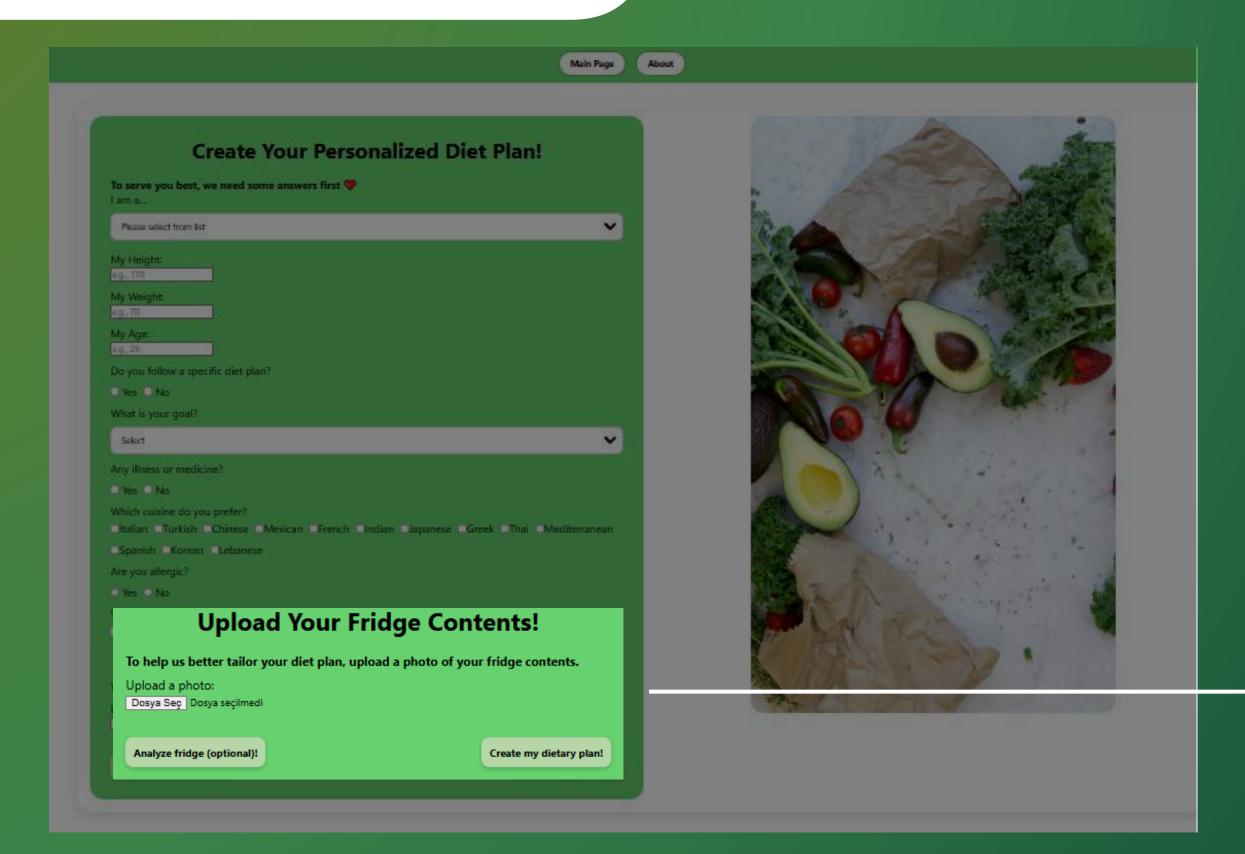
Taste Preferences



Multiple choice



Fridge Contents

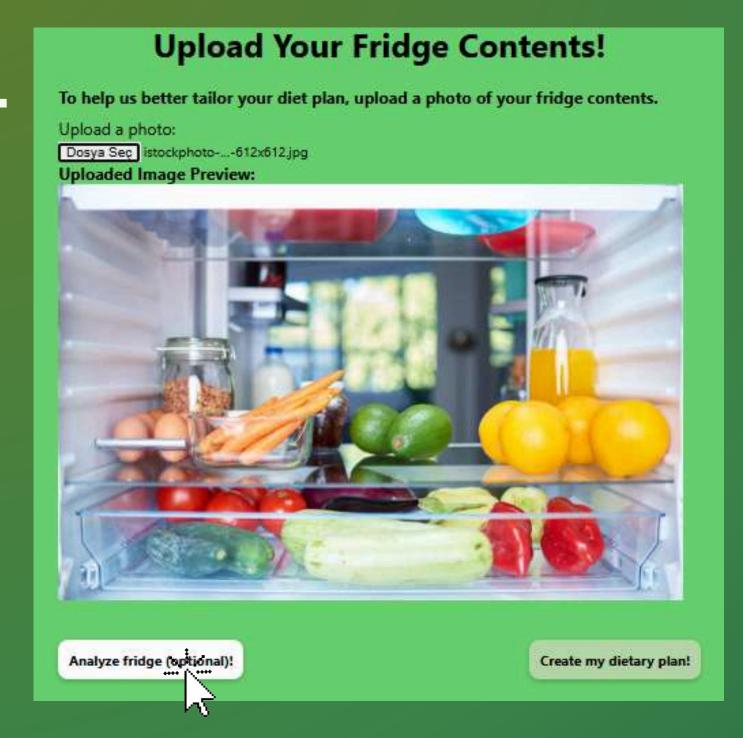


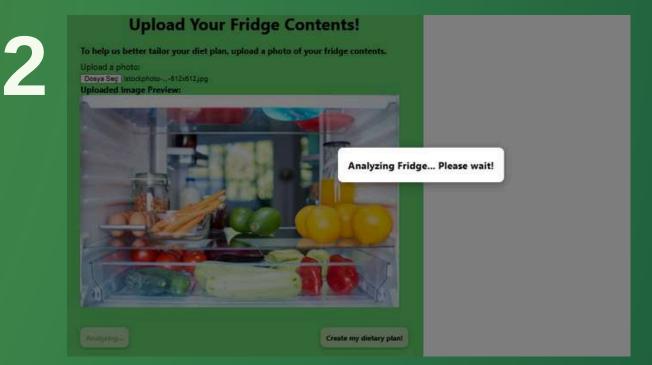
User should

→upload his/her
fridge's photo.



Fridge Contents





Items in Your Fridge: Eggs Carrots Avocado Oranges Granola or nuts in a jar Milk (in the background) Orange juice Cherry tomatoes Cucumber Zucchini Red bell pepper Green bell pepper Eggplant Analyze fridge (optional)! Create my dietary plan!



1

Upload Your Fridge Contents!

To help us better tailor your diet plan, upload a photo of your fridge contents.

Upload a photo:

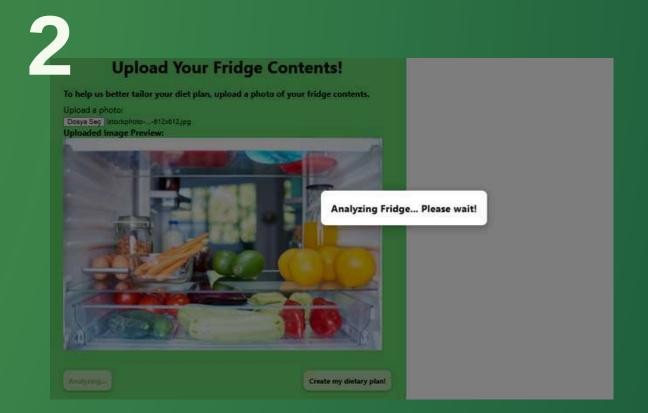
Dosya Seç istockphoto-...-612x612.jpg

Uploaded Image Preview:





Create my dietary plan!



Eggs
Carrots
Avocado
Oranges
Granola or nuts in a jar
Milk (in the background)
Orange juice
Cherry tomatoes
Cucumber
Zucchini
Red bell pepper
Green bell pepper

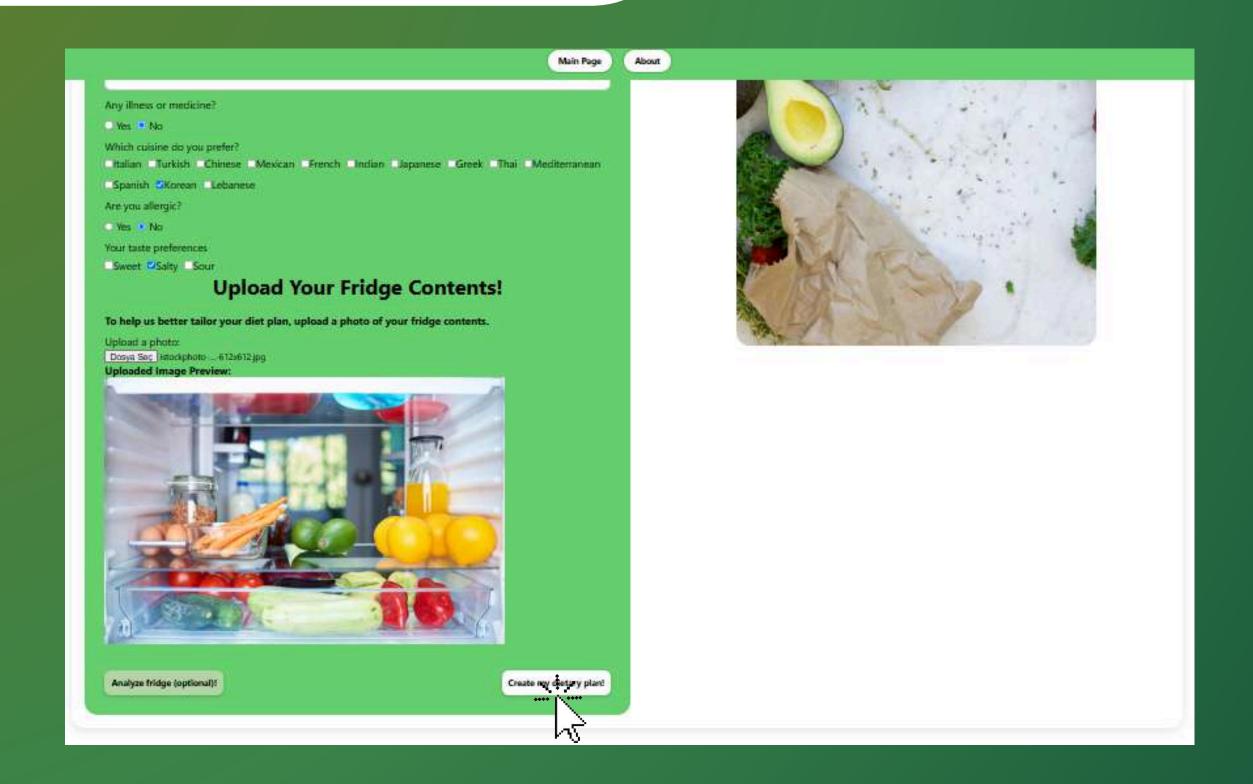
Eggplant

Analyze fridge (optional)!

Create my dietary plan!



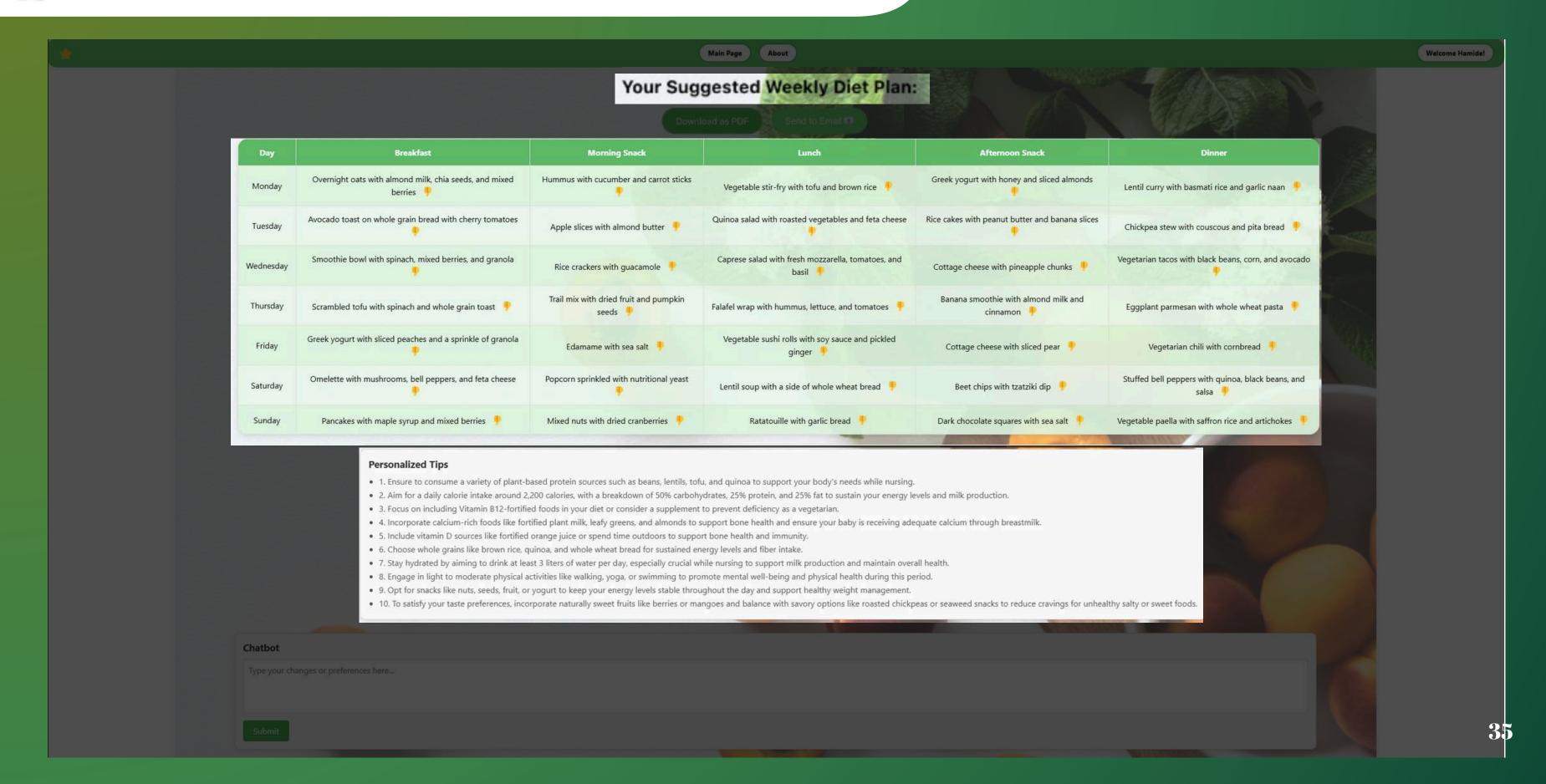
Create my dietary plan!



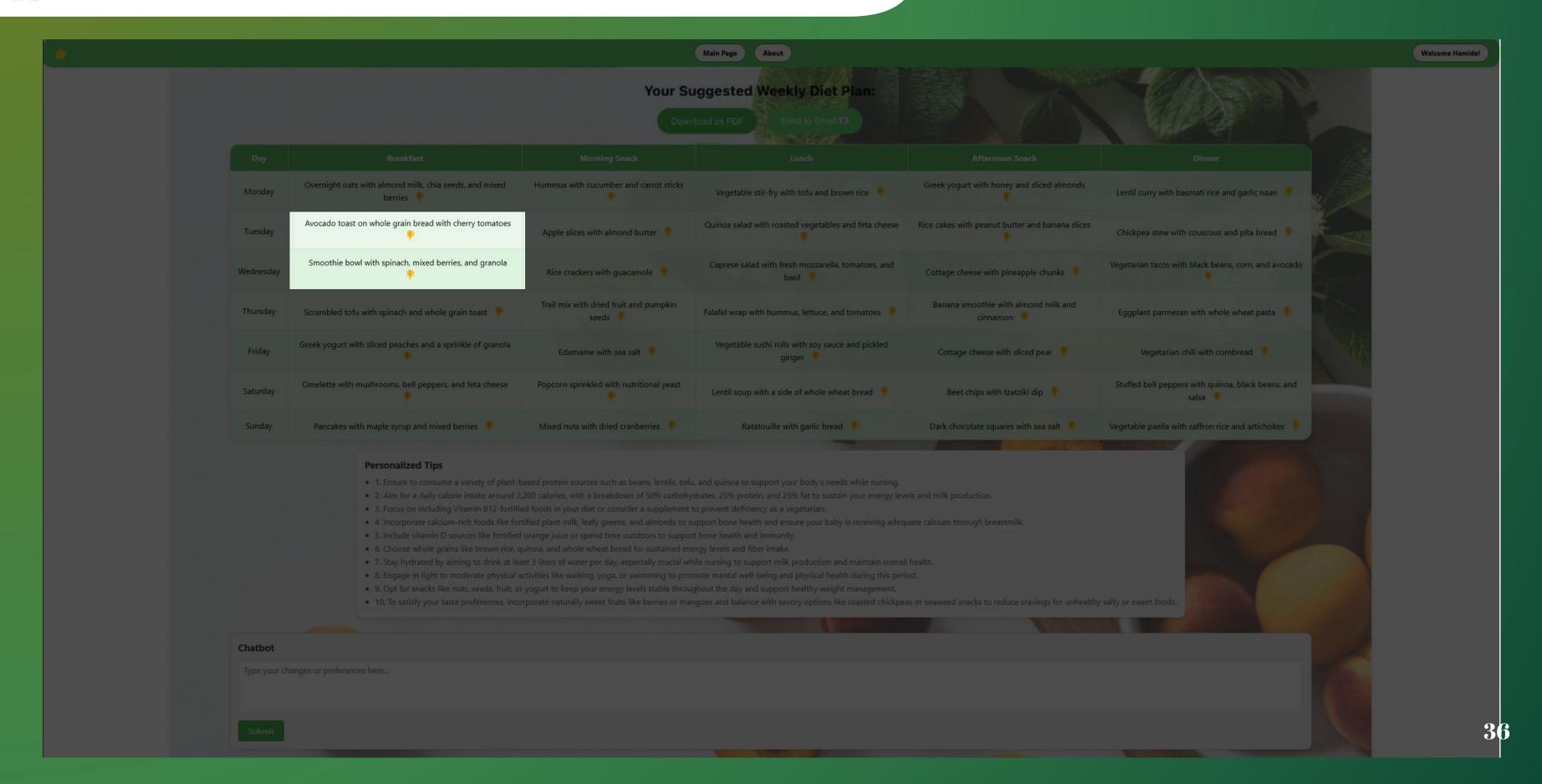
SUGGESTED WEEKLY DIET PLAN

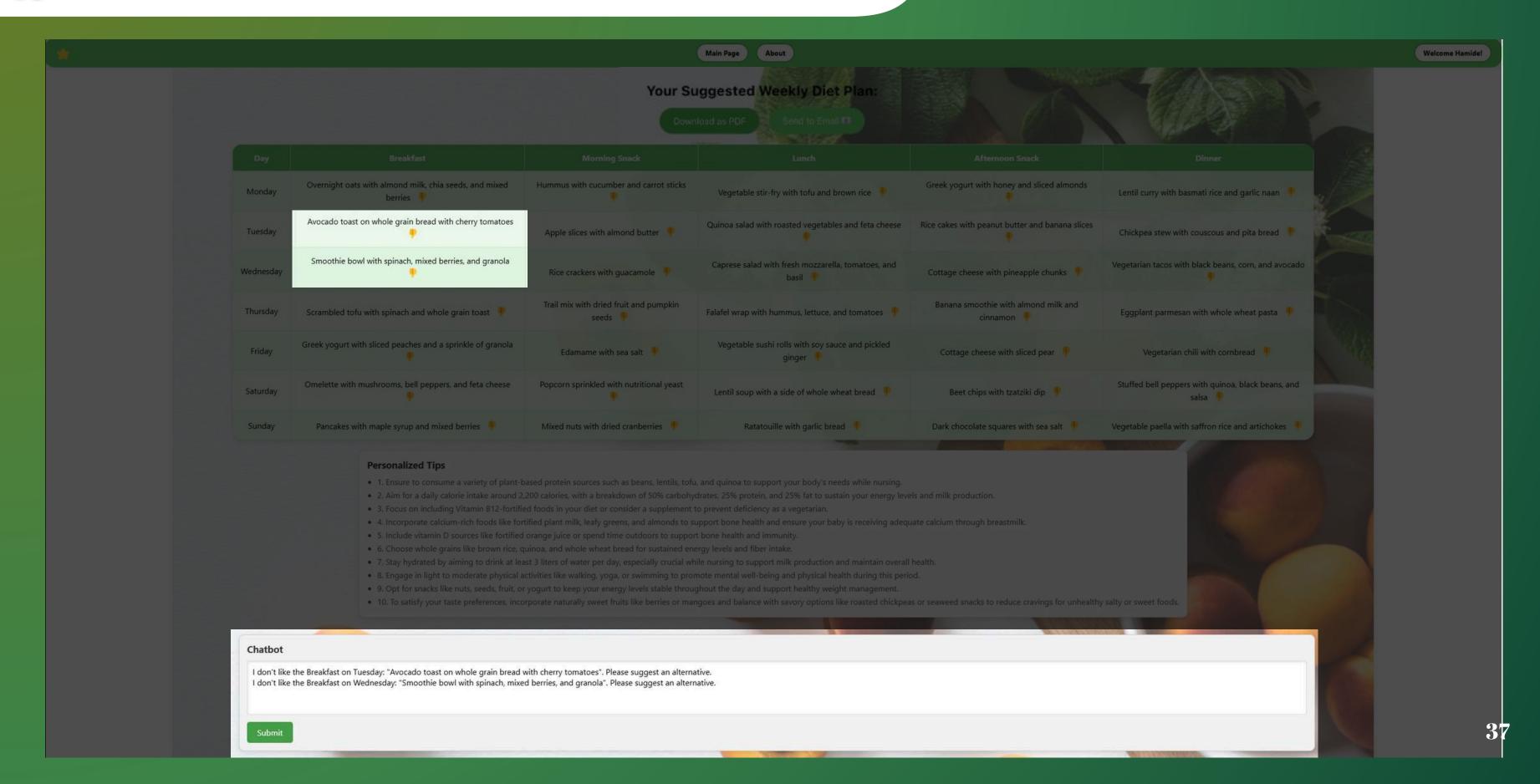
Your Suggested Weekly Diet Plan: Overnight oats with almond milk, chia seeds, and mixed Hummus with cucumber and carrot sticks Greek yogurt with honey and sliced almonds Vegetable stir-fry with tofu and brown rice Lentil curry with basmati rice and garlic naan berries 🤚 Avocado toast on whole grain bread with cherry tomatoes Quinoa salad with roasted vegetables and feta cheese Rice cakes with peanut butter and banana slices Tuesday Apple slices with almond butter Chickpea stew with couscous and pita bread Smoothie bowl with spinach, mixed berries, and granola Caprese salad with fresh mozzarella, tomatoes, and Vegetarian tacos with black beans, corn, and avocado Rice crackers with guacamole Cottage cheese with pineapple chunks Wednesday Trail mix with dried fruit and pumpkin Banana smoothie with almond milk and Eggplant parmesan with whole wheat pasta Scrambled tofu with spinach and whole grain toast Falafel wrap with hummus, lettuce, and tomatoes seeds 🥊 cinnamon ** Greek yogurt with sliced peaches and a sprinkle of granola Vegetable sushi rolls with soy sauce and pickled Friday Edamame with sea salt Cottage cheese with sliced pear 🥊 Vegetarian chili with cornbread Stuffed bell peppers with quinoa, black beans, and Omelette with mushrooms, bell peppers, and feta cheese Popcorn sprinkled with nutritional yeast Saturday Lentil soup with a side of whole wheat bread Beet chips with tzatziki dip salsa Pancakes with maple syrup and mixed berries Mixed nuts with dried cranberries Ratatouille with garlic bread Dark chocolate squares with sea salt Vegetable paella with saffron rice and artichokes Personalized Tips . 1. Ensure to consume a variety of plant-based protein sources such as beans, lentils, tofu, and quinoa to support your body's needs while nursing. . 2. Aim for a daily calorie intake around 2,200 calories, with a breakdown of 50% carbohydrates, 25% protein, and 25% fat to sustain your energy levels and milk production. • 3. Focus on including Vitamin B12-fortified foods in your diet or consider a supplement to prevent deficiency as a vegetarian. . 4. Incorporate calcium-rich foods like fortified plant milk, leafy greens, and almonds to support bone health and ensure your baby is receiving adequate calcium through breastmilk. . 5. Include vitamin D sources like fortified orange juice or spend time outdoors to support bone health and immunity. . 6. Choose whole grains like brown rice, quinoa, and whole wheat bread for sustained energy levels and fiber intake. . 7. Stay hydrated by aiming to drink at least 3 liters of water per day, especially crucial while nursing to support milk production and maintain overall health. . 8. Engage in light to moderate physical activities like walking, yoga, or swimming to promote mental well-being and physical health during this period. . 9. Opt for snacks like nuts, seeds, fruit, or yogurt to keep your energy levels stable throughout the day and support healthy weight management. • 10. To satisfy your taste preferences, incorporate naturally sweet fruits like berries or mangoes and balance with savory options like roasted chickpeas or seaweed snacks to reduce cravings for unhealthy salty or sweet foods. Chatbot Type your changes or preferences here...

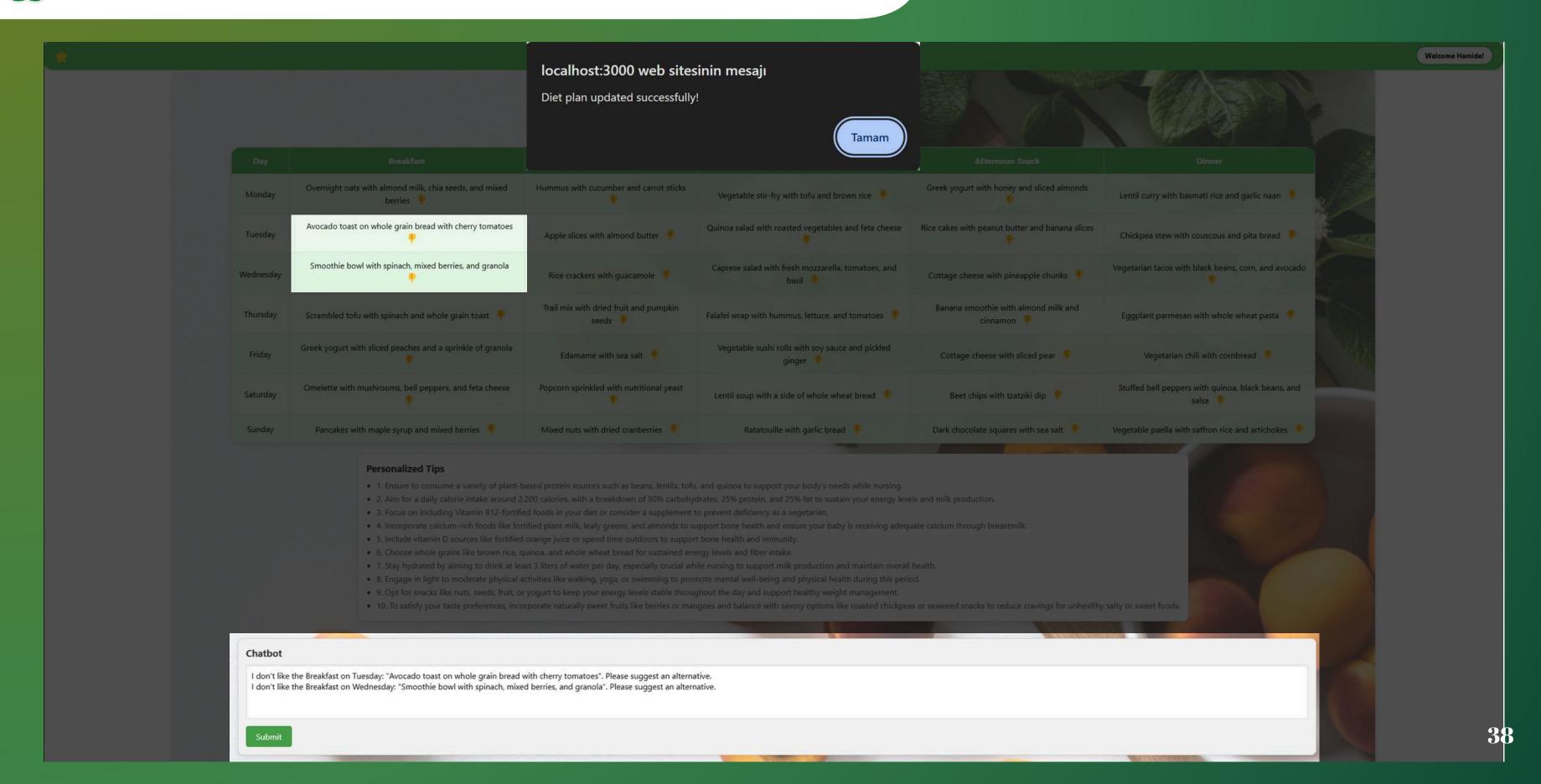
SUGGESTED WEEKLY DIET PLAN

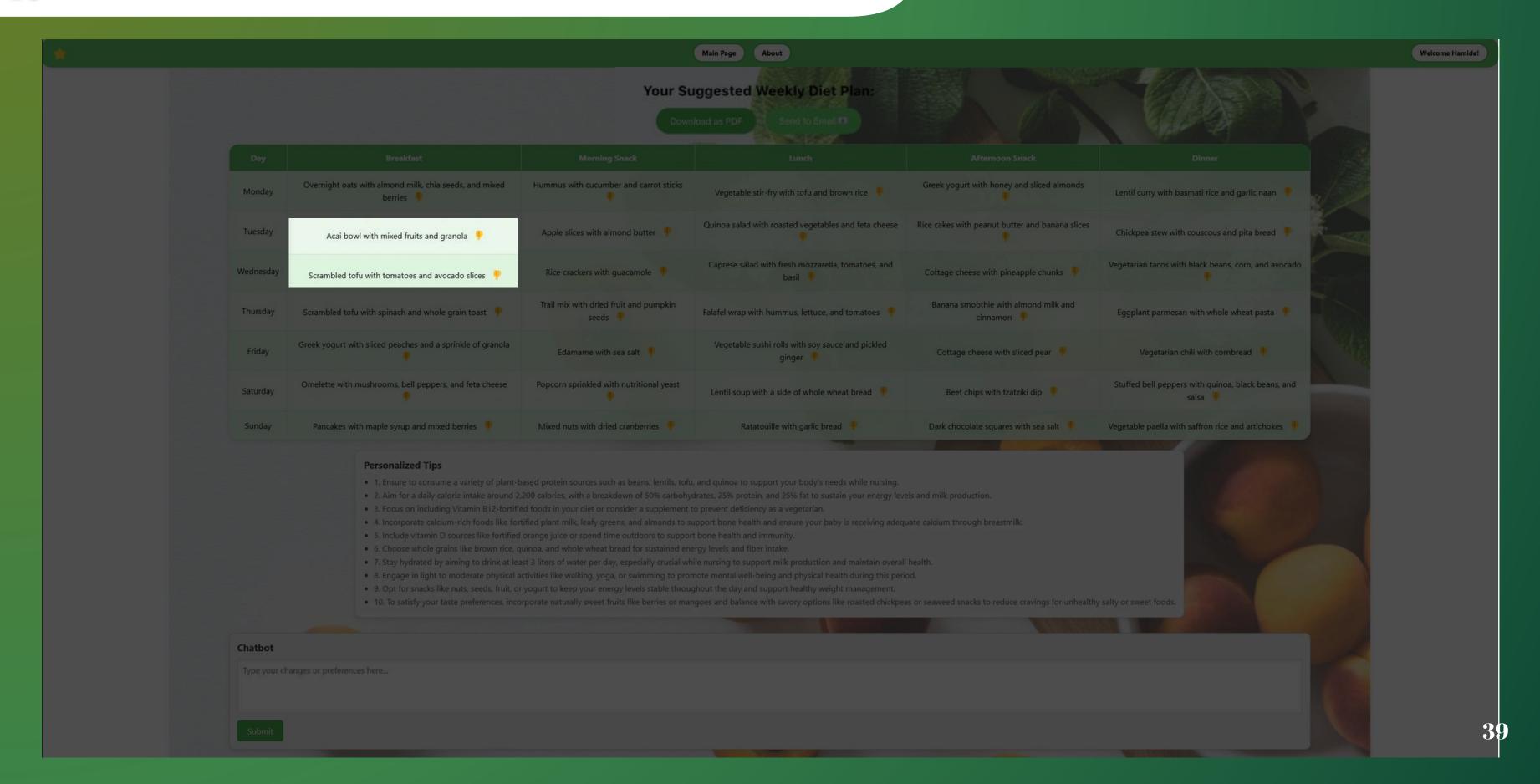


SUGGESTED WEEKLY DIET PLAN

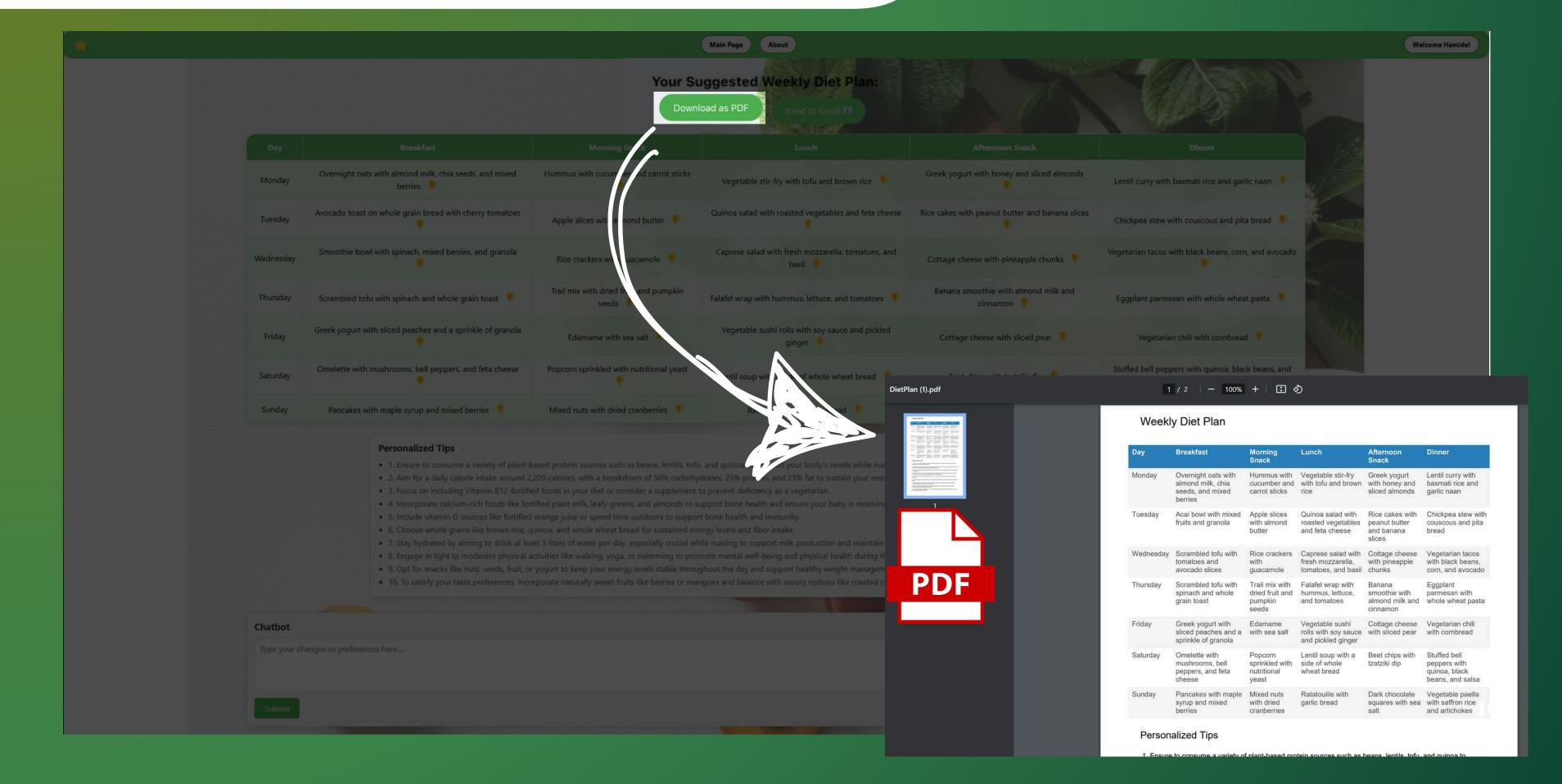
















Your Suggested Weekly Diet Plan:

Download as PDF

Day	Breakfast	Morning Snack	Lunch	Afternoon Snack
Monday	Overnight oats with almond milk, chia seeds, and mixed berries	Hummus with cucumber and carrot sticks	Vegetz ale 5' 4-fry with tofu and brown rice	Greek yogurt with honey and sliced almonds
Tuesday	Avocado toast on whole grain bread with cherry tomatoes	Apple slices with almond butter	Quinc 4 s /ad with roasted vegetables and feta cheese	Rice cakes with peanut butter and banana slices
Wednesday	Smoothie bowl with spinach, mixed berries, and granola	Rice crackers with guacamole	Capre e salad with fresh mozzarella, tomatoes, and basil	Cottage cheese with pineapple chunks
Thursday	Scrambled tofu with spinach and whole grain toast	Trail mix with dried fruit and pumpkin seeds	Falafel v p with hummus, lettuce, and tomatoes	Banana smoothie with almond milk and cinnamon
Friday	Greek yogurt with sliced peaches and a sprinkle of granola	Edamame with sea salt	Vegetable vishi rolls with soy sauce and pickled ginger	Cottage cheese with sliced pear
Saturday	Omelette with mushrooms, bell peppers, and feta cheese	Popcorn sprinkled with nutritional yeast	Lentil soup with a side whole wheat bread	Beet chips with tzatziki dip
Sunday	Pancakes with maple syrup and mixed berries	Mixed nuts with dried cranberries +	Ratatouille with garlic brea.	Dark chocolate squares with sea salt

Personalized Tips

- 1. Ensure to consume a variety of plant-based protein sources such as beans, lentils, tofu, and quinoa to support your body's needs while no
- . 2. Aim for a daily calorie intake around 2,200 calories, with a breakdown of 50% carbohydrates, 25% protein, and 25% fat to sustain your
- . 3. Focus on including Vitamin B12-fortified foods in your diet or consider a supplement to prevent deficiency as a vegetarian.
- . 4. Incorporate calcium-rich foods like fortified plant milk, leafy greens, and almonds to support bone health and ensure your baby is receiving adequate calcium through breastmilk.
- . 5. Include vitamin D sources like fortified orange juice or spend time outdoors to support bone health and immunity.
- 6. Choose whole grains like brown rice, quinoa, and whole wheat bread for sustained energy levels and fiber intake.
- . 7. Stay hydrated by aiming to drink at least 3 liters of water per day, especially crucial while nursing to support milk production and maintain overall health.
- . 8. Engage in light to moderate physical activities like walking, yoga, or swimming to promote mental well-being and physical health during this period.
- . 9. Opt for snacks like nuts, seeds, fruit, or yogurt to keep your energy levels stable throughout the day and support healthy weight management.
- . 10. To satisfy your taste preferences, incorporate naturally sweet fruits like berries or mangoes and balance with savory options like roasted chickpeas or seaweed snacks to reduce cravings for unhealthy s

Chatbot

Type your changes or preferences here...

Your Personalized Diet Plan

Dear kaoutar.aitbenali,

Thank you for using our Diet Planning Assistant. Here is your personalized weekly meal plan, carefully crafted to help you achieve your health and fitness goals!

Weekly Meal Schedule

Monday

- Breakfast: Scrambled eggs with spinach and avocado
- . Morning Snack: Greek vogurt with mixed berries
- . Lunch: Beef and broccoli stir-fry with cauliflower rice . Afternoon Snack: Sliced cucumbers with hummus
- · Dinner: Baked sesame chicken with stir-fried vegetables

- . Breakfast: Chia pudding with coconut milk and sliced almonds
- Morning Snack: Apple slices (Replace with pear slices)
 Lunch: Shrimp and vegetable stir-fry with konjac noodles
- . Dinner: Pork dumplings with steamed bok choy

Wednesday

- . Breakfast: Coconut flour pancakes with sugar-free syrup
- . Morning Snack: Celery sticks with peanut butter
- · Afternoon Snack: Mixed nuts
- · Dinner: Egg drop soup with stir-fried tofu and green beans

Thursday

- . Breakfast: Keto smoothie with coconut milk, avocado, and spinach
- · Morning Snack: Hard-boiled eggs
- . Lunch: Beef and mushroom lettuce wraps
- . Afternoon Snack: Almond flour crackers with guacamole
- Dinner: General Tso's chicken with roasted Chinese broccoli

- Breakfast: Baked avocado eggs with salsa
 Morning Snack: Cottage cheese with sliced peaches (Replace with berries)
- . Lunch: Stir-fried pork with cabbage and bell peppers
- Afternoon Snack: Sugar-free iello
- . Dinner: Lemon garlic shrimp with cauliflower fried rice

- . Breakfast: Zucchini fritters with sour cream
- . Morning Snack: Protein shake with almond milk
- Lunch: Cashew chicken with snap peas and water chestnuts
 Afternoon Snack: Seaweed snacks
- . Dinner: Teriyaki salmon with grilled asparagus

Sunday

- · Breakfast: Spinach and feta omelet

- Morning Snack: Pickled vegetables
 Lunch: Sesame ginger beef with shirataki noodles
 Afternoon Snack: Kelo fat bombs
 Dinner: Stir-fried tofu with broccoli and bell peppers

Personalized Tips

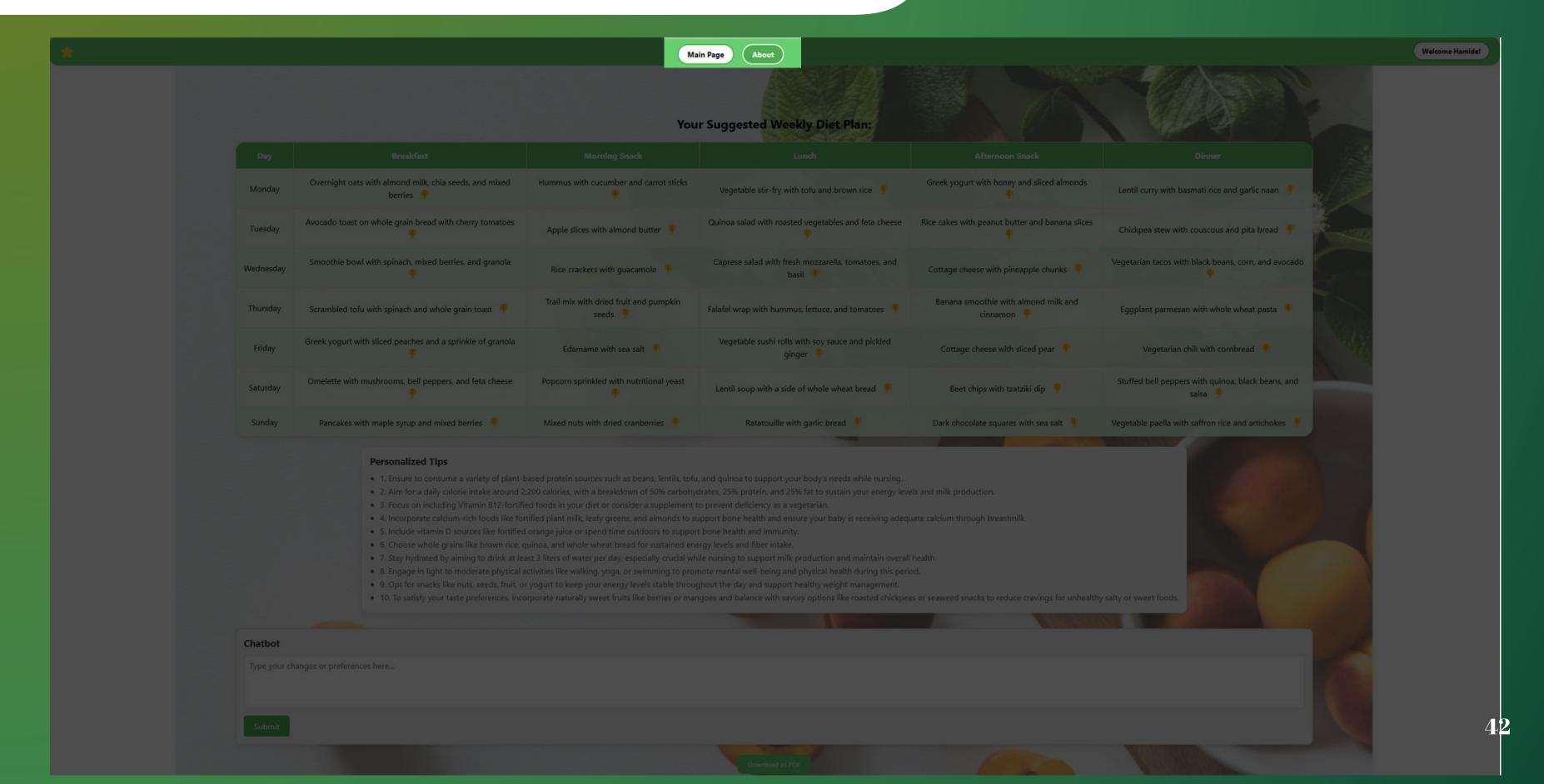
- I noticed that you have no specific items detected in your fridge. Based on these
 ingredients, I have suggested meals that align with your dietary preferences.
 However, you may still need to buy additional ingredients such as essential spices, fresh vegetables, or protein sources to complete your meals.
- 1. Aim for a daily calorie intake of around 1600-1800 calories, with a breakdown of approximately 5-10% carbohydrates, 20-25% protein, and 65-75% fat to maintain a
- keto diet and support your calorie deficit goal.

 2. Ensure you are getting enough Vitamin D through foods like fatty fish, egg yolks, and fortified dairy products, or consider a supplement given your limited sun
- exposure due to pregnancy.

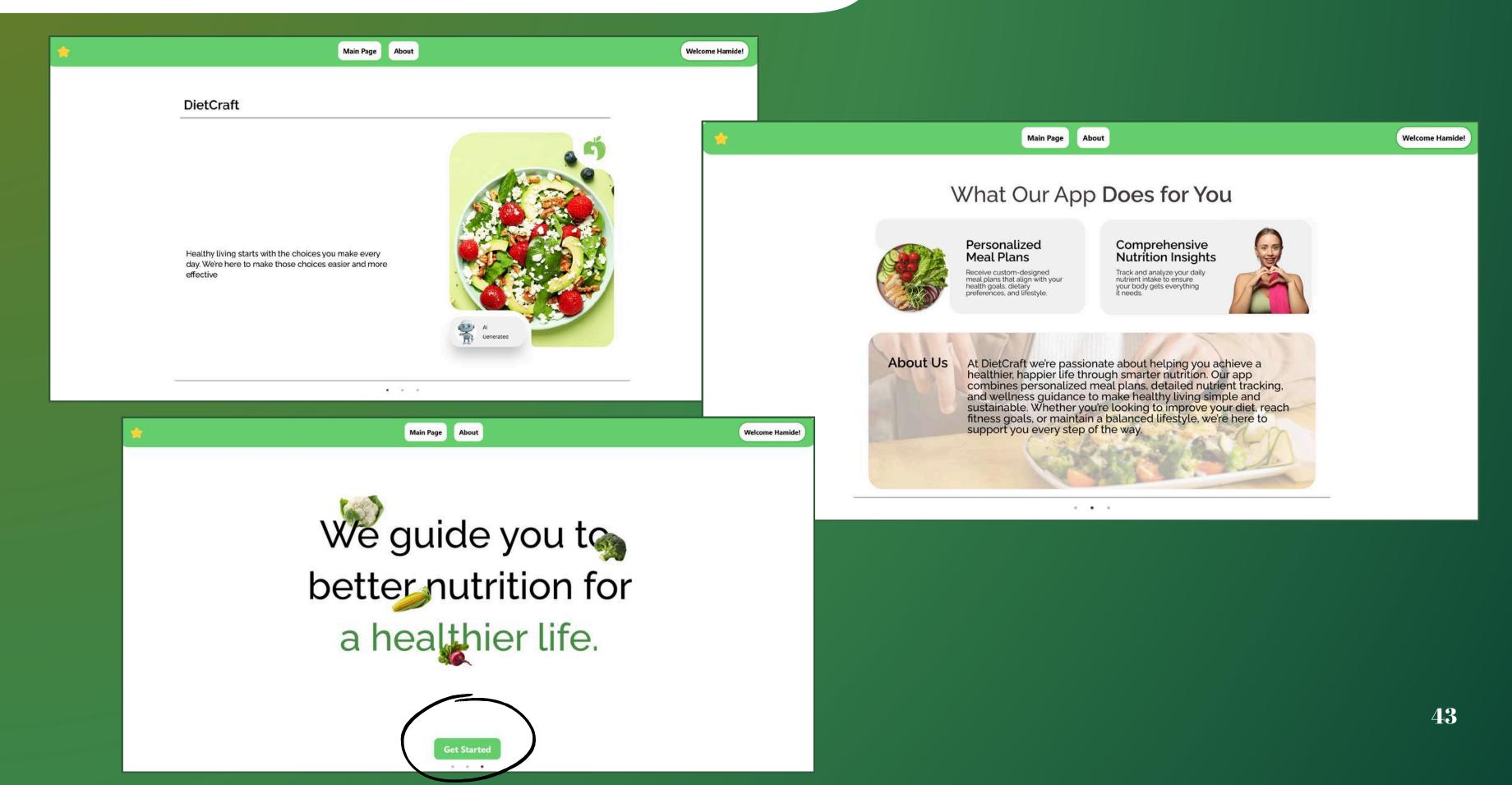
 3. Focus on consuming foods rich in Vitamin C, such as citrus fruits, bell peppers, and strawberries, to support your immune system and iron absorption
- 4. Incorporate sources of iron like lean poultry, beans, and fortified cereals, especially important during pregnancy to prevent anemia.

 5. Due to hypertension, limit your sodium intake by avoiding processed or salty
- foods and flavor your meals with herbs, spices, and lemon juice instead.
- 6. Include calcium-rich foods such as dairy products, tofu, and leafy greens to support both your bone health and your baby's development during pregnancy.
 7. Stay hydrated by aiming for at least 8-10 glasses of water per day, adjusting
- based on your activity level and pregnancy needs.
 Include magnesium sources like nuts, seeds, and dark chocolate in your diet to help with muscle function and heart health, particularly essential with hypertension.
 Opi for Chinese cuisine options that are low in refined carbohydrates and high in
- lean proteins and vegetables to align with your keto diet and calorie deficit goal.

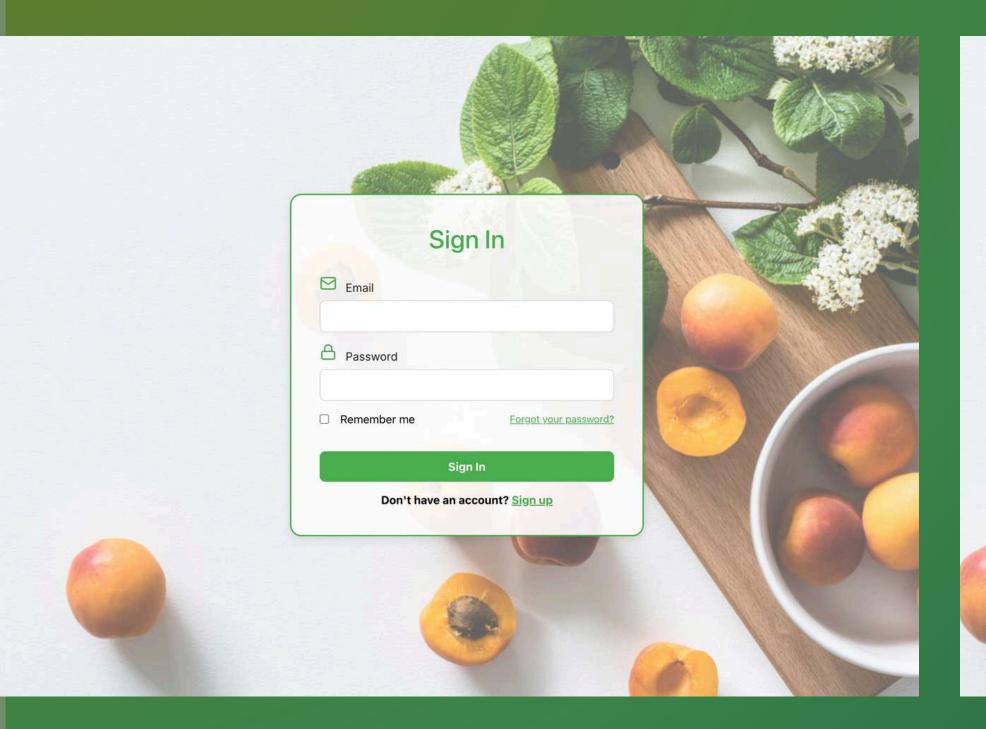
 10. Engage in pregnancy-sale physical activities like prenatal yoga or swimming to stay active and support your overall health and well-being during this special time.

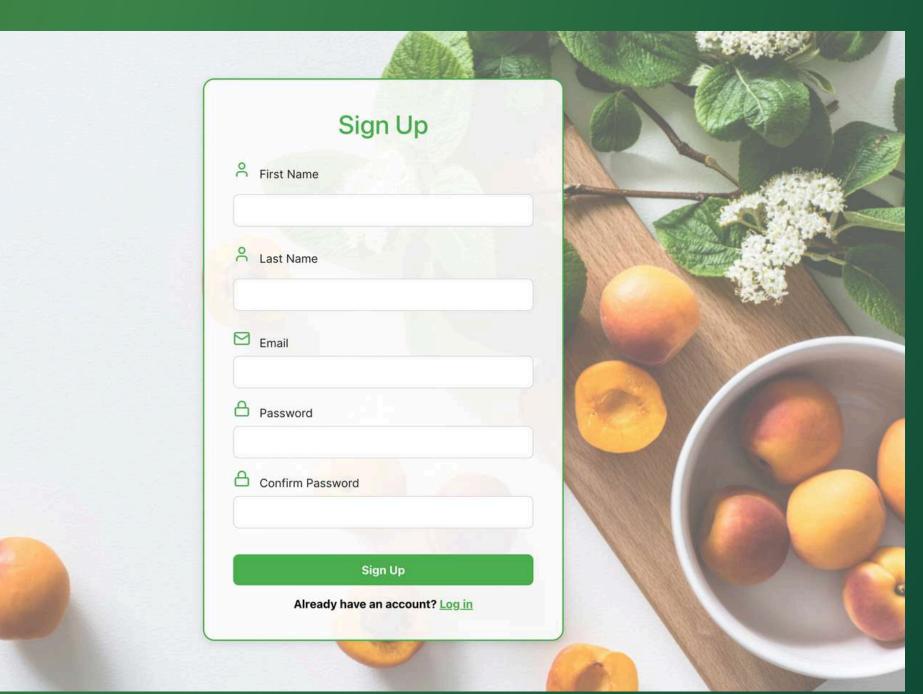




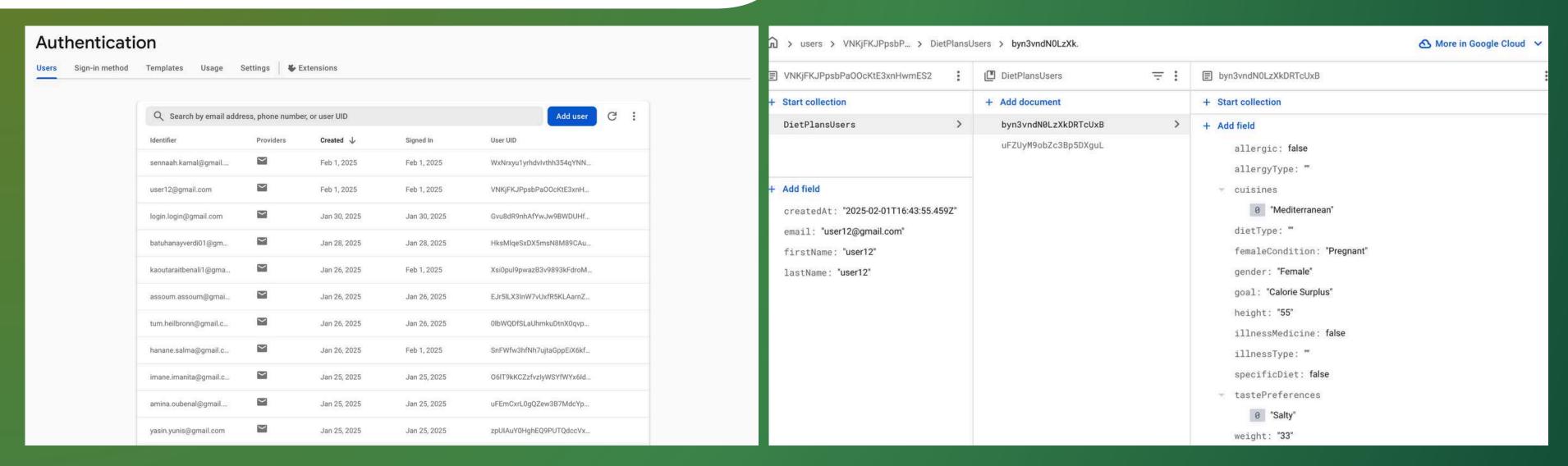


LOGIN PAGE









Our chatbot integrates with Firebase to personalize diet plans by capturing user feedback, storing preferences, and updating meal plans in real-time—when a user rejects an ingredient, Firebase records the change, the AI suggests alternatives, and the updated plan is seamlessly saved for future recommendations.

WHAT WE HEAR



"The Al-generated meal plans were useful, but I'd love more customization options."

99

"Fridge analysis worked well, but some detected items weren't accurate."



IMANE

PAULA





"Would be great to see meal recipe videos directly in the app!"



"The app is easy to use, but I'd like an option to manually adjust portion sizes."



ARAD



- Enhanced Customization Allow users to modify portion sizes, swap ingredients, and set dietary restrictions.
- Improved Fridge Analysis Boost AI accuracy for better ingredient detection and meal suggestions.
- Recipe Videos & Links Add clickable links and embedded tutorials for meal prep.
- Better UX & Interaction Refine design, navigation, and user flow for a smoother experience.
- Smart Meal Matching Let users upload past meals for Al-based similar suggestions.
- Mobile Optimization Ensure seamless performance across devices.
- Freemium & Premium Model Offer expert dietitian support in a premium tier.
- Multilingual Support Expand accessibility with multiple language options.

