**1. Introduction**

This document outlines the functional and nonfunctional requirements for the AI-powered smart cooking web application. The app will assist users in meal planning, recipe recommendations, shopping list generation, and step-by-step cooking guidance, leveraging AI technology.

**2. Functional Requirements**

**2.1 User Registration & Authentication**

1. Users must register with Name, Age, Height, Weight, Email, and Phone Number.

2. Users must verify their email address before accessing the app.

3. Users can log in using email and password.

4. Users can recover their lost password using their email address.

5. BMI is automatically calculated based on user input.

6. Users will complete a questionnaire to specify food preferences, dietary restrictions, known allergies, intolerances, and calorie goals.

7. Registered users can update their profile details anytime.

8. Users can reset chatbot history at any time.

9. A 1-week free trial is available for new premium users.

**2.2 AI-Powered Chatbot for Recipe Assistance**

10. The chatbot will ask users what ingredients they have available before suggesting recipes.

11. The chatbot will remember user preferences, allergies, and goals for personalized suggestions.

12. If a user doesn’t know what to cook, the chatbot will suggest recipes based on available ingredients.

13. Premium users will receive fully personalized meal recommendations considering dietary goals, intolerances, and food preferences.

14. Users can provide feedback to improve chatbot recommendations.

**2.3 Dynamic Step-by-Step Cooking Guide**

15. The dynamic step-by-step cooking guide is available only for premium users.

16. AI-generated text-based and audio cooking instructions for premium users.

17. The cooking process adjusts dynamically based on user feedback (e.g., pause, repeat step, request extra time).

18. AI sets timers for recipes requiring specific cooking durations.

19. AI provides estimated preparation and cooking times for recipes.

20. Users can request an alternative cooking method (e.g., oven vs. stovetop preparation).

21. AI learns from user interactions to improve the cooking guide experience.

**2.4 Recipe Management**

22. All saved recipes are stored in the "My Recipes" tab for later access.

23. Users can mark favorite recipes and find them in the "My Recipes" tab.

24. Recipe history will be stored and sorted by monthly, weekly, and daily categories.

25. Free users receive recipes as-is, with only missing ingredient substitutions.

26. Premium users can request AI to modify recipes (e.g., lower calories, increase protein, remove specific ingredients).

27. Users can provide feedback on suggested recipes to improve recommendations.

**2.5 Top Picks - Manually Curated Recipes**

28. The "Top Picks" section will feature manually curated recipes from professional chefs.

29. Picks will include appetizers, main courses, and desserts.

30. Users can browse recipes updated on a weekly or monthly basis.

31. Premium users can filter "Top Picks" based on meal type, dietary preference, and preparation time.

**2.6 Shopping List**

32. Premium users can generate a shopping list based on selected recipes.

33. Users can manually add their own ingredients and planned recipes.

34. The shopping list will be categorized for easier navigation (e.g., dairy, vegetables, spices, etc.).

35. AI suggests cost-effective ingredient alternatives when necessary.

36. Users can receive notifications when they are low on frequently used ingredients.

**2.7 Meal Tracking & Reports**

37. The app will track consumed meals based on the recipes users cook.

38. The app will generate daily calorie reports for users.

39. AI will provide recommendations to balance weekly nutritional intake.

**2.8 Notifications & AI-Driven Suggestions**

40. In-app reminders for upcoming meals and meal plans.

41. AI-generated cooking timers to assist users during meal preparation.

42. AI-generated tips when a user repeatedly chooses unhealthy meals or exceeds calorie goals.

43. Users can provide feedback on AI-generated substitutions.

44. AI recommends new recipes based on past interactions and preferences.

45. AI will provide suggestions for reducing food waste based on available ingredients.

46. AI will provide notifications for expiring ingredients.

**2.9 Premium Subscription & Access Control**

47. Users attempting to access premium features will see prompts encouraging them to upgrade.

48. Users can securely enter payment details and subscribe to the premium plan.

49. The system must process payments using a secure payment gateway.

50. Users can update or cancel their subscription through the app.

51. The system must notify users of successful or failed payments.

**2.10 AI Capabilities & Enhancements**

52. AI will generate intelligent ingredient substitutions.

53. Premium users can customize ingredient substitutions (e.g., prefer almond milk over oat milk).

54. AI will suggest budget-friendly ingredient alternatives when necessary.

55. AI will use OpenAI or Gemini for natural language processing and recommendation generation.

56. AI-generated audio instructions will be powered by text-to-speech technology.

57. AI will learn from user interactions to improve future recommendations.

**2.11 Contact & Support System**

58. Users can reach support via a traditional email-based inquiry system.

59. Users can track past inquiries through the app.

60. An FAQ section will be available for common issues and troubleshooting.

61. Users can leave feedback on the app’s functionality and AI suggestions.

**3. Nonfunctional Requirements**

**3.1 Performance & Scalability**

1.The system must support at least 10,000 concurrent users without performance degradation.

2. Recipe search and chatbot responses must be delivered within 2 seconds.

3. The system should be able to scale dynamically based on user demand.

### **3.2 Security & Data Privacy**

4. User authentication must be implemented using OAuth 2.0 or a similar secure authentication protocol.

5. All personal and payment information must be encrypted using AES-256 encryption.

6. The system must comply with GDPR and CCPA for data protection and user privacy.

7. Users must have the option to delete their personal data upon request.

8. API keys and sensitive credentials must be stored securely and never exposed in client-side code.

### **3.3 Availability & Reliability**

9. The system must maintain an uptime of 99.9%.

10. Automatic failover mechanisms should be in place to prevent downtime.

11. A robust backup and disaster recovery plan must be in place to restore data in case of failures.

### **3.4 Usability & Accessibility**

12. The user interface must be intuitive and easy to navigate.

13. The app should be WCAG 2.1 AA compliant for accessibility.

14. Text and button sizes should be adjustable to accommodate users with visual impairments.

### **3.5 Compatibility & Platform Support**

15. The web app must be fully responsive and work seamlessly on desktop, tablet, and mobile devices.

16. The system must support all major web browsers, including Chrome, Firefox, Safari, and Edge.

### **3.6 Maintainability & Extensibility**

17. The codebase should follow modular architecture to allow for easy updates and feature expansion.

18. A comprehensive logging and error tracking system should be in place.

19. New feature deployments should follow CI/CD (Continuous Integration/Continuous Deployment) practices.

### **3.7 AI Model Performance & Improvements**

20. AI recommendations should improve over time based on user interactions.

21. The AI model should be retrained periodically to maintain accuracy and relevance.

22. Users should have the option to provide feedback to refine AI-generated recipes.

### **3.8 Compliance & Legal Requirements**

23. The application must comply with GDPR, CCPA, and PCI-DSS standards.

24. Terms and Conditions, as well as the Privacy Policy, must be available and accessible from the app.

### **3.9 Payment Processing & Financial Security**

25. Payments must be processed through a PCI-DSS compliant payment gateway.

26. Users must receive email confirmations for every successful or failed transaction.

27. Subscription renewal reminders should be sent 7 days before the next billing cycle.

### **3.10 Customer Support & Issue Resolution**

28. Customer support must be available via email and FAQs.

29. Support inquiries must receive a response within 24 hours.

30. Users should be able to track the status of their support tickets within the app.