**AI Project Synopsis**

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**Class 12D**

**1. Title**

“CookBot: Your Personal AI Chef”

**2. Introduction**

Cooking is an essential part of our daily lives, but it can be challenging for beginners or busy individuals. In this project, We aim to bridge this gap by creating an AI-powered recipe recommendation system that not only suggests delicious recipes but also guides users step-by-step through the cooking process. By combining culinary expertise with artificial intelligence, We intend to make home cooking more accessible, enjoyable, and sustainable.

**3. Objective**

Our primary objective is to develop an AI model that recommends personalised recipes based on user preferences and dietary restrictions. Additionally, We aim to provide real-time guidance during cooking, ensuring that users follow each step correctly. By doing so, We hope to promote healthier eating habits, reduce food waste, and enhance culinary skills.

**4. Methodology**

Our approach will combine content-based filtering and natural language processing (NLP). Here are the key components of my methodology:

* **Content-Based Filtering:**

1. Analyse recipe features such as ingredients, cuisine type, and difficulty level.
2. Calculate similarity scores between user preferences and existing recipes.
3. Recommend recipes similar to those the user has liked before.

* **Natural Language Generation (NLG):**

1. Generate detailed cooking instructions dynamically based on the recipe steps.
2. Use NLG templates for common cooking actions (e.g., chopping, sautéing).

**5. Dataset**

Our dataset will consist of a diverse collection of recipes sourced from reputable cooking websites, cookbooks, food blogs, etc. Each recipe entry will include information on ingredients, preparation steps, and user ratings. We will preprocess the data to ensure consistency and relevance.

**6. Proposed Solution**

* **Recipe Representation:**

1. Convert recipes into a vector space representation (e.g., TF-IDF or word embeddings).
2. Use this representation to calculate similarity scores.

* **Interactive Chatbot:**

1. Develop a chatbot that engages with users during cooking.
2. Ask questions like, “Have you preheated the oven?” or “Did you add the spices?”.
3. Guide users through each step.

**7. Expected Outcomes**

**I anticipate the following outcomes:**

* Improved recipe recommendations tailored to user preferences.
* Enhanced cooking experiences with real-time guidance.
* Increased user confidence in trying new recipes.

**8. Timeline**

**Data Collection (Week 1-2):**

* Gather and preprocess recipe data.

**Model Development (Week 3-4):**

* Implement content-based filtering and NLG components.

**Training and Testing (Week 5-6):**

* Train the model on the dataset.
* Evaluate performance using user feedback.

**Integration and Deployment (Week 7):**

* Integrate the chatbot into a user-friendly app.

**Documentation and Logbook:**

* Maintain detailed records of progress.

**9. Resources**

* **Software:** Python, TensorFlow, NLTK, Flask (for chatbot interface)
* **Hardware:** Desktop: CPU-'Ryzen 5 5600x', GPU-'RTX 3080', RAM-'16gb 3200mhz'
* **Support:** Online tutorials, AI community forums, School Teacher

**10. Conclusion**

CookBot aims to revolutionise home cooking by combining AI-driven recommendations with interactive guidance. We believe that empowering users in the kitchen contributes to healthier lifestyles and a more sustainable food culture. Challenges may include handling diverse cuisines, addressing user-specific dietary needs, and ensuring seamless chatbot interactions.

**11. References**

* Recipe websites and cookbooks.
* Research papers on NLG and recommendation systems.