

Application Idea: ***Decipher2Dine***

Decipher2Dine is an application that takes names of different dishes as input from its users in speech or text formats, deciphers the contents of dish preparation, and returns the ingredients to the users. The items present in the dish are available in both speech output and text output to the user. The user can get the result in a preferred language and choose a nutritional value analysis report of the dish.

Motivation: Identify the ingredients and nutritional contents of a dish by simply giving speech input of dish name. The users can understand the contents beforehand and determine whether that dish is suited for them or not. The application finds its use-cases for people with;

- food allergies who need to avoid specific food items
- restrictive diet preferences (like vegetarians, vegans, lactose intolerance, etc.)
- health issues that require avoiding consumption of certain foods
- students in nutrition and dietician professions, trainee chefs as a reference platform for learning and sharing
- travelers to identify local ingredient names and explore cuisines with ease

The users can convert the ingredient names in their native languages or another preferred language. The application requires human language processing to understand the input given by the user, which is in speech or text form, and process it to derive the contents and nutritional values of the given dish.

Design: The application takes speech or text as input from the user. The speech is transformed into text using speech-to-text conversion techniques. The derived text with the dish name discovers similarities with the recipes dataset using text analytics ML processes. The ingredients linked to the recipe dataset return items associated with the dish. The ingredient list is returned to the user using text-to-speech methods and also made available in text format for viewing. The user can choose to get the output in another language by requesting verbally or selecting a language from the dropdown. If the user asks for a dish's nutrition report, the filtered ingredients map to the nutritional values datasets, and the final analysis gets shared with the user.

Input: The user says the name of a dish or types the name in the textbox on the application, i.e., input is in speech or text form. Example: Teriyaki Fried Chicken is the dish name spoken by the user or typed in the textbox. Users can also ask (speech or typed input) for a nutritional content analysis of the dish. Example of user input: Give nutritional value for Teriyaki Fried Chicken.

Output: The application outputs a list of ingredients in the dish. The result is available to the users in both speech and text format. The user is also provided with the option (a button to give speech input OR a dropdown) to select a preferred language they want to get the output in.

The output gets displayed in the language requested by the user in text format and as speech output.

Internal Processes: Speech-to-text conversion, text analytics, text classification, language translations, mapping the dish name to ingredients, nutritional value analysis report generation (if requested), Text-to-speech conversion.

Analysis:

The limitations of the proposed application are; the result (i.e., the list of ingredients output) given by this application is generic. The result of the ingredients list may not match the exact contents of the same dish prepared in other regions. To devise and help users get accurate contents of the dish would require adding a few filtering questions on the dish after the input is received. The implication of using the alternative solution would be to get a faster, more precise items list. But it impacts users' interaction with the application.