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Programming 3
Homework Specification
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Description of the Task

The Java task being created is centered around a Digital Recipe Book designed to organise a personal collection of recipes through a user-friendly GUI. This application has the aim to make it easy for users to add, view, edit, and categorise recipes, in a digital manner.

Key features of the Digital Recipe Book are outlined below:

Recipe Management
Users can add new recipes, edit existing ones, delete recipes, and view detailed information about each recipe. A recipe entry may include:

- Name: A descriptive title of the recipe.
- Ingredients: A list of ingredients required for the recipe.
- Instructions: Step-by-step cooking instructions.
- Tags: Users can tag recipes with keywords (e.g., "vegetarian," "quick") to improve searchability.

Recipe Categorisation
Recipes are categorised via their meal type (e.g. Breakfast, Lunch, Dinner, Dessert) to make it quick and easy to find recipes based on the type of meal. This will be showcased in a JTree structure on the GUI.

Search and Filter
The application allows users to search for recipes by keywords, tags or specific ingredients. This feature improves usability, ensuring users are able find recipes that correspond with the available ingredients or particular preferences.

Data Persistence
Recipes are to be saved across sessions, utilising Java serialisation to store the recipe collection in a file, which reloads after the application is reopened.

Graphical User Interface (GUI)
The GUI is planned to be built with Java Swing, having a menu bar featured for main actions, a JTree for categorisation, and panels for displaying recipes and search results, in turn, providing an intuitive, visually organised way for users to interact with their digital recipe collection.

Testing and Reliability
The application would also include unit tests for its core functions, such as adding, editing, and deleting recipes. This would enforce the core stability of the application, especially as more recipes are added or updated.

The purpose of the Digital Recipe Book is to help gastronomy enthusiasts collet, access and manager their recipes through a digital schema, providing rapid search options and eliminating the need to maintain physical notes. This application could also be beneficial to small restaurant owners, meal planners, or anyone who cooks in a frequent manner.

Use-Cases

Use-Case	Actor	Description	Preconditions	Postconditions
Add	User	Can add a new recipe though entering the name, ingredients, tags and instructions	Must have opened the Add Recipe section	A new recipe is to be saved to the collection and showcased in a sorted list
View	User	Can select a designated recipe to observe all details	Must have existing recipe	A recipe's details are to be displayed in the designated section
Edit	User	Can modify existing data of a recipe	Must have a recipe in selected mode	A recipe's information should be saved in its updated form
Delete	User	Can delete recipe entirely	Must have a recipe in selected mode	A recipe should no longer exist in the data file
Search	User	Can search and filter recipes via keywords or ingredients etc.	Must have at least one existing recipe to be searched	A list of recipes matching the search criteria should be displayed

Brief Description of the Solution

The application will follow a Model-View-Controller (MVC) structure. The model handles the core data, storing recipes in a collection and managing file input and ouput, the view uses components most likely from Java Swing for the GUI, and the controller manages user actions, as those seen above in the use-cases.
Some key classes, which will most likely be used, can be classified by the following:

1. Recipe
   - Represents individual recipes, storing attributes like name, ingredients, instructions, and tags.

2. RecipeManager
   - Manages operations on the recipes, including adding, editing, deleting, and searching within the collection.

3. RecipeSerialiser
   - Handles file output/input using Java serialisation, ensuring recipes are saved and reloaded across sessions.

Other components to keep into consideration are the UI features such as some kind of main frame, a recipe panel, an add recipe dialog window, and a search panel for filtration. In reality, a user would utilise the application by, starting the application through the main frame, saving or loading data, if had already used the program, then add or edit pages in the recipe dialog window, and then utilise other functions of the application, before saving and exiting. Behind the scenes, before the application will be able to coherently work, unit tests can be executed to verify the application's stability as new recipes are added, removed etc.

The Digital Recipe Book will offer an organised, user-friendly way to manage a collection of recipes, enhancing the cooking experience by making recipe information easy to store, search, and retrieve. This application combines core Java principles with practical functionality, delivering a project that reflects the concepts covered in class while also being useful in real-world scenarios.