* + - Module Code : FC724
    - Class/Group: Group A
    - Module Title: Programming Practical Applications
    - Assessment Title: Project
    - Tutor Name: Callum Birkett
    - Student GUID Number: P453118
    - Date of Submission: 5th May

**I confirm that this assignment is my own work. Where I/we have referred to academic sources, I have provided in-text citations and included the sources in the final reference list.**

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**Project Overview and Justification**

**Project Description**

**Software Architecture and Implementation**

**Algorithm Description**

Main Algorithm/Visual Representation/Function Descriptions

**Testing and Debugging**

Testing Evidence/Bug Fixing

**Learning and Reflection**

Development Process/Challenges and Solutions

The reflection should include:

* Skills developed
* Why those skills are important
* How you developed those skills
* How you might change your process for future projects(mention problems that you have)

**Object-Oriented Design and Data Structures**

**User Guide (Optional)**

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**Module Descriptions**

我原本是一個完全不會煮飯的人。After studying abroad我開始喜歡上料理 也凱使嘗試各式各樣的料理 該專案旨在建立一個使用者友好的應用程式來組織和管理個人食譜

這個專案的理由是解決各種烹飪書、網站和筆記中分散的食譜的常見問題，這使得很難找到和有效地使用它們。且此專案最大的目的是根據使用者自己的習慣跟口味去記錄這些菜 而不是清一色的無腦按造網路上或書上食譜來料理 此管理器也更好的讓使用者下次想再做一次這道菜的時候更快速找到這菜使用者的秘密食譜 此應用程式將為使用者提供一個集中的、可搜尋的和易於訪問的解決方案，以儲存、檢索和管理他們的食譜 它還將允許使用者輕鬆分享食譜。

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{

"title": "Spaghetti Bolognese",

"description": "A classic Italian pasta dish.",

"servings": 4,

"cuisine": "Italian",

"category": "Dinner",

"ingredients": [

{

"name": "Spaghetti",

"quantity": 400,

"unit": "g"

},

{

"name": "Ground beef",

"quantity": 250,

"unit": "g"

},

{

"name": "Tomato sauce",

"quantity": 1,

"unit": "cup"

}

],

"steps": [

"Cook spaghetti until al dente.",

"Brown the ground beef.",

"Mix in tomato sauce and simmer.",

"Combine with spaghetti and serve."

]

},

{

"title": "microwave scrambled eggs",

"description": "",

"servings": 1,

"cuisine": "",

"category": "",

"ingredients": [

{

"name": "eggs",

"quantity": 2.0,

"unit": ""

},

{

"name": "milk (optional, for creaminess)",

"quantity": 1.0,

"unit": "tablespoon"

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{

"name": "salt and pepper",

"quantity": 1.0,

"unit": ""

},

{

"name": "Small knob of butter or a tiny spray of cooking oil",

"quantity": 1.0,

"unit": ""

}

],

"steps": [

"Prep the mug: If you like, put the butter in a microwave-safe mug and microwave for about 10 seconds until melted. Alternatively, lightly spray the mug with cooking oil.",

"Whisk eggs: Crack the eggs into the mug. Add milk (if using), salt, and pepper. Whisk everything together with a fork until the yolks and whites are combined.",

"Microwave: Microwave on high for 30 seconds.",

"Stir: Take the mug out and stir the eggs with a fork.",

"Microwave again: Microwave for another 30-60 seconds, or until the eggs look mostly set but are still a little moist. Cooking time can vary depending on your microwave."

]

},

{

"title": "Quick Chicken Stir-Fry",

"description": "A simple and flavourful Asian-inspired stir-fry",

"servings": 2,

"cuisine": "Asian",

"category": "Dinner",

"ingredients": [

{

"name": "Chicken breast",

"quantity": 300.0,

"unit": "g"

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{

"name": "Mixed vegetables",

"quantity": 200.0,

"unit": "g"

},

{

"name": "soy sauce",

"quantity": 2.0,

"unit": "tbsp"

},

{

"name": "sesame oil",

"quantity": 1.0,

"unit": "tbsp"

},

{

"name": "rice",

"quantity": 150.0,

"unit": "g"

},

{

"name": "",

"quantity": null,

"unit": null

}

],

"steps": [

"Cook rice according to package instructions.",

"Cut chicken breast into bite-sized pieces",

"Heat sesame oil in a pan or wok",

"Stir-fry chicken until cooked through",

"Add mixed vegetables and stir-fry until tender-crisp",

"Pour in soy sauce and toss to coat.",

"Serve hot with cooked rice",

null

]

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{

"title": "cheesy tomato pasta bake",

"description": "A comforting and easy pasta bake with tomatoes and cheese",

"servings": 4,

"cuisine": "Italian-American",

"category": "dinner",

"ingredients": [

{

"name": "pasta",

"quantity": 300.0,

"unit": "g"

},

{

"name": "canned chopped tomatoes",

"quantity": 400.0,

"unit": "g"

},

{

"name": "garlic",

"quantity": 2.0,

"unit": "cloves"

},

{

"name": "dried oregano",

"quantity": 1.0,

"unit": "tsp"

},

{

"name": "mozzarella cheese",

"quantity": 150.0,

"unit": "g"

},

{

"name": "parmesan cheese",

"quantity": 50.0,

"unit": "g"

}

],

"steps": [

"Cook pasta according to package instructions until slightly underdone",

"Preheat oven to 180\u00b0C (160\u00b0C fan/Gas Mark 4)",

"Saut\u00e9 minced garlic in a pan with a little olive oil until fragrant",

"Add chopped tomatoes and oregano. Simmer for 5-10 minutes",

"Drain the pasta and add it to the tomato sauce. Stir well",

"Pour the pasta mixture into an ovenproof dish",

"Top with slices of mozzarella and grated Parmesan cheese",

"Bake in the preheated oven for 20-25 minutes, or until the cheese is melted and bubbly.",

"Let it rest for a few minutes before serving",

"A comforting and easy pasta bake with tomatoes and cheese."

],

"notes": "Add cooked vegetables or meat to the sauce for extra flavour and nutrients. You can also use different types of cheese"

},

{

"title": "Lentil Soup",

"description": "A hearty and nutritious vegetarian soup",

"servings": 4,

"cuisine": "international",

"category": "Lunch/Dinner",

"ingredients": [

{

"name": "red lentils",

"quantity": 200.0,

"unit": "g"

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{

"name": "vegetable broth",

"quantity": 1.5,

"unit": "litres"

},

{

"name": "onion",

"quantity": 1.0,

"unit": "medium"

},

{

"name": "carrots",

"quantity": 2.0,

"unit": "medium"

},

{

"name": "celery stalks",

"quantity": 2.0,

"unit": "medium"

},

{

"name": "diced tomatoes",

"quantity": 400.0,

"unit": "g"

},

{

"name": "garlic",

"quantity": 2.0,

"unit": "cloves"

},

{

"name": "dried thyme",

"quantity": 1.0,

"unit": "tsp"

},

{

"name": "bay leaf ",

"quantity": 1.0,

"unit": ""

}

],

"steps": [

"Rinse the lentils under cold water",

"ice the onion, carrots, and celery",

"Mince the garlic",

"Heat a little oil in a large pot over medium heat.",

"Add the onion, carrots, and celery and cook until softened, about 5-7 minutes",

"Stir in the garlic and thyme and cook for another minute until fragrant",

"Add the rinsed lentils, vegetable broth, and diced tomatoes",

"Add the bay leaf",

"Bring to a boil, then reduce heat and simmer for 25-30 minutes, or until the lentils are tender",

"Remove the bay leaf before serving",

"Season with salt and pepper to taste"

],

"notes": "You can blend some of the soup at the end for a smoother texture. Serve with crusty bread",

"image\_path": "noooo"

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"title": "Tuna Salad Sandwich",

"description": "A quick and easy sandwich for lunch or a light meal",

"servings": 1,

"cuisine": "american",

"category": "lunch",

"ingredients": [

{

"name": "canned tuna in water, drained",

"quantity": 150.0,

"unit": "g"

},

{

"name": "mayonnaie",

"quantity": 2.0,

"unit": "tbsp"

},

{

"name": "celery",

"quantity": 1.0,

"unit": "stalk"

},

{

"name": "red onion",

"quantity": 0.25,

"unit": "small"

},

{

"name": "lemon juice",

"quantity": 1.0,

"unit": "tsp"

},

{

"name": "salt",

"quantity": 1.0,

"unit": "to taste"

},

{

"name": "black peper",

"quantity": 1.0,

"unit": "to taste"

},

{

"name": "bread slices",

"quantity": 2.0,

"unit": ""

},

{

"name": "lettuce leaves",

"quantity": 1.0,

"unit": ""

}

],

"steps": [

"In a bowl, flake the drained tuna with a fork",

"Add mayonnaise, chopped celery, and finely chopped red onion to the tuna",

"Squeeze in lemon juice and season with salt and black pepper to taste",

"Mix all the ingredients well until combined",

"Spread the tuna salad evenly onto one slice of bread",

"Top with lettuce leaves if desired",

"Place the other slice of bread on top",

"Cut the sandwich in half and serve"

],

"rating": 3.0,

"notes": "You can add other ingredients like sweetcorn, chopped pickles, or hard-boiled eggs to the tuna salad. Use your favourite type of bread",

"image\_path": "yummmmmm"

}

]