

Final Project Assignment Brief – Deep Learning & GenAI

FoodVisionAI: Automated Nutritional Analysis App

Module: Data Analytics-3

Duration: 14 days

Total Points: 100

Assignment type: Individual project implementation and delivery

Format: Final presentation, Demo, Documentation

Instructor: Prof. Dr. Gayan de Silva

Date: December 4th, 2025

1. Overview

This final project requires each student to build an AI-based application that takes an image of a meal and automatically predicts nutritional information such as calories, fat, carbohydrates, and protein. Students must use a pretrained deep learning model and customise their project based on their local cuisine (e.g., Indian food, Chinese food, Malaysian food, etc.). A simple and familiar interface (web app/mobile app/Streamlit/Gradio) is sufficient.

2. Core Requirements

- Use a
 - pretrained vision model (EfficientNet, ResNet, ViT, CLIP, YOLO etc.).
 - OR any other pretrained vision of a opensource small GenAI model
 - AND fine-tuning with a small local-food dataset
- Retrieve nutritional values from a provided/sourced dataset after predicting the food item.
- Integrate a generative model(opensource for heavy stuff, final polishing you may use an API for online better version) to explain the food, describe its nutrition, provide meal suggestions, or healthy alternatives.
- Create a simple UI allowing image upload and displaying analysis and ask questions.

3. Optional Extended Features(you will get higher marks)

- Multiple-food detection
- Portion-size estimation and calculate the consumption based on the portion
- Option to correct if the detection are not correct
- Personalised dietary recommendations
- Speed/cost optimisation of the pretrained model
- Architecture improvements or quantisation

4. Assessment Criteria (Total 100 Marks)

1. UI and Features : App design, usability, stability.

2. Extended Features : Creativity beyond requirements.
3. Model Efficiency & Improvements: Cost reduction, speed enhancements, architecture improvements.
4. Presentation & PPT : Clarity, demonstration, explanation.
5. Documentation & Code Quality : Structure, README, comments, reproducibility.

5. Deliverables

- Source code and project folder.
- UI-based working application.
- Documentation (README and technical report).
- Short presentation (8–10 minutes).

6. Deadline

16. 12. 2025 at 9am to 1pm. Exact timeslot will be given to you, later.

7. Notes

You are encouraged to use open-source datasets and pretrained models. The focus is on intelligent system design, model usage, and creative GenAI integration rather than training models from scratch.

Exam

8. Presentation format (5 mins)

- Cover page
- Architecture diagram – explain the flows
- Covered features
- Extended features
- Difficulties came across and how to overcome them
- Future work

9. Demo (5 mins)

- demo end to end
- exam: Run a FoodVisionAI application on a image given by the examiner at that time

10. Documentation (no need to present)

- this should cover how to install and set up the application
- user guide
- technical details
- limitations