

Machine Learning

Coursework 2 & 3 Specification

General Information

Please read the following information carefully before starting your coursework.

- Submission date: **15 Nov 2023 by 23:59 GMT** online via Moodle.
- Contribution: **50%** of the total mark.
- Academic misconduct: All submissions will be processed through plagiarism tool. If signs of misconduct are found, all students involved will be contacted to discuss further steps. Please see here for information on academic integrity at the university.

<https://portal.roehampton.ac.uk/information/Pages/Academic-Integrity.aspx>.

Our guiding principle is that academic integrity and honesty are fundamental to the academic work you produce at the University of Roehampton. You are expected to complete coursework which is your own and which is referenced appropriately. The university has in place measures to detect academic dishonesty in all its forms. If you are found to be cheating or attempting to gain an unfair advantage over other students in any way, this is considered academic misconduct and you will be penalised accordingly. Please don't do it. It is not worth it.

- Grading advice: While fully functioning programs and its documentation that meet all the requirements are the goal of the test, the programs and the rationale for their design, implementation, testing and discussion will be assessed for efficiency, simplicity, creativity, and good style.

Coursework Task

Imagine that you work for an AI company, you are asked to develop a machine learning product that can classify images. You will design a neural network for this image classification task. To complete this task, you are suggested to follow the instructions below.

- Find a public image dataset. The dataset should contain images (or pixels) with their associated labels/classes. You can use any image dataset (e.g., animal images, flower images, etc.) except for the digits image dataset in lab solutions. You can look for the dataset on any public data website and here is just an example: <https://paperswithcode.com/datasets?task=image-classification>
- Import the data to your program. Define the input and output. Split the data into training and testing datasets.
- Design a neural network for this image classification task. Your neural network should at least have input layer, hidden layer, and output layer. Please feel free to add other layers and design your own neural network structure.
- Build the neural network using training dataset and evaluate it using testing dataset. Present the evaluation result (e.g., accuracy).
- Explain the training process and the model structure in a simple clear way. Please feel free to use plot or flowchart.
- [Optional] Quickly rerun the designed codes and achieve the similar outcome without error.
- [Optional] Ask the user to import or select an image as test sample. Present the classification result.
- [Optional] Develop any other additional feature you want.

Submission Requirement

You should submit the codes with your name and ID number. The file should contain documentation explaining your implementation (comment your code).

You will also need to present your work in either the following two ways:

- Present to a tutor during lab session within two weeks after the due date.
- Record your screen while running the codes and include the video link **WITHIN** your submission. The video should be less than 10 minutes and highlight the key features you implemented.