Assignment Topic: Neural Network Models for Object Recognition
Nowadays, Artificial Intelligence (AI) artefacts are powering various industries and sectors globally. Many AI products, like self-driving cars, for example, utilise object detection. The ability to build intelligent products that can detect objects is a valuable skill. Some other interesting applications of object detection include: Face detection (in the new iPhone), object tracking, people counting, pedestrian detection, video surveillance etc.

In this task, you are required to build one Neural Networks using the CIFAR-10-Object Recognition image dataset.

“CIFAR-10 hosted in Kaggle, and directly in keras-datasets, is an established computer-vision dataset used for object recognition. It is a subset of the 80 million tiny images dataset, and consists of 60,000 32x32 colour images containing one of 10 object classes, with 6000 images per class. It was collected by Alex Krizhevsky, Vinod Nair, and Geoffrey Hinton.”

Your overall task is to build the neural networks and evaluate the performance of the model. You are expected to create a validation set from the training set. Hence you would have:

A Training set
A Validation set
A Testing set
Your ML model should address following points:

Describe how you created your validation set from your training set and give details of the data (metadata).
Discuss the rationale for having a validation set.
Discuss the structures of the ANN.
Discuss the activation function used.
Discuss the loss function used.
Give an account of the number of epochs used in the models.
Discuss your approach to aspects of the Neural Network design.
Include a concluding section, discussing the knowledge gained during the entire exercise.
The required language for data mining for this assignment is Python.

Instructions
For this assignment, you are required to record a 20-minute presentation, along with a transcript of the audio file. The presentation should include your demonstration. Your slides should not be wordy or repeat, verbatim, the oral presentation. Visuals, illustration, statistics, charts, tables and indication of key pointers are welcome. In assessing the presentation for marking, emphasis will be placed on the oral content.

However, clarity of the visual presentation will also be taken into account. It is strongly recommended that, in order to record your presentation, you use a headset with a microphone. Please ensure that your citations and list of references are included in the slides and citations mentioned in your transcript.

There is no word count for the slide presentation, and there is no fixed word count for the oral presentation/transcript. However, note that an average speech rate for a comfortable and clearly orally paced presentation is about 100-150 words per minute. Given that your presentation should be about 20 minutes, you can work against a minimum of 2,000 to a maximum of 2,500 words in your oral presentation/transcript. Before submitting the work, consider the following checklist in conjunction with the applicable grading criteria (see the Module Resources page):