Deep Learning - Lab 6 Exercise

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Exercise 1

Exercise 1.1:Finetuning ResNet50 model.
The following is my methodology for finetuning ResNet50 model.

1. Load the pre-trained model and freeze all other parameters that have already been trained, since we just need to train the last Full Connected layer.
2. The Average Pooling layer was replaced with an Adaptive Average Pooling layer which enables the model to accept non-square inputs.
3. The output of the newly initialised Linear Layer is set as the number of classes in the training dataset.

The results are shown in Table 1. It can be observed that after 30 iterations, the finetuned model performs better than the original model with 2 Convolutional layers and 3 Full connected layers on the boating dataset.

	Train_Acc	Validation_Acc	Test_Acc
Orignial	0.74	0.78	0.75
Finetuning	0.76	0.78	0.75

Table 1: The original and finetuning model

Exercise 2

Exercise 2.1:Reflect on the two different approaches.
The results are shown in Table 2. The model's training took 8 seconds, which is 75 times faster than the previous two models (the original and finetuning models), and the accuracy consistency suggests that the model is not overfitting and is fully trained. However, all of the models had a lower classification performance for the class with the lower training data, such as in the class of Sandoloaremi, Barchino, and MotoscafoACTV. This is especially the same in the SVM model. Besides, the classes which have the most data, such as water and VaporettoACTV attributed to the high classification accuracy of results. This is because the dataset is unbalanced, Overall, The performance of the SVM model is better than the finetuned model in terms of speed and overall accuracy.

	Train_Acc	Validation_Acc	Test_Acc
SVM	0.87	0.87	0.85

Table 2: SVM model