Task 2

Bird Classification Report

Split.py: a python script was created to split the dataset into train and test sets using the clause, 0 for testing and 1 for training.

Data Cleaning and Pre-processing:

A validation split was done in the ratio of 9:1 from the training set and various image augmentations such pixel normalisation, shearing, zooming, centre cropping and horizontal and vertical flipping were performed using PyTorch.

Model Training and Methodology:

Many well-known pre-trained models, including Resnet50, Resnet101, and Efficientnet_b0, were used to implement transfer learning. Resnet101, however, performed a little bit better than Efficientnet_b0.

Hyperparameters Used:

Optimizer Used: Adam optimizer was implemented with learning rates of 0.001 for Efficientnet_b0 and 0.0001 for Resnet50 and Resnet101 due to its versatility in that it performs well for both deep and shallow networks as well as sparse tensors.

Activation Layer: Rectified Linear Unit (ReLU) was chosen because it requires relatively little computing and can make the network more non-linear.

To learn enough features and fit them into the memory, a batch size of 32 was used. To speed up training while maintaining acceptable picture quality, 224x224 images were employed. 18 epochs were utilised since the model attained a local minimum after around 169 iterations.

All the Hyperparameters were passed through the StepSchedular for training and testing of the models.

It can be significantly noted that the optimal parameters selected were after many trials and errors.

Best Model: Resnet101, Accuracy: 79%

Confusion Matrix Heatmap: