HW4: Wild Animals Part 1
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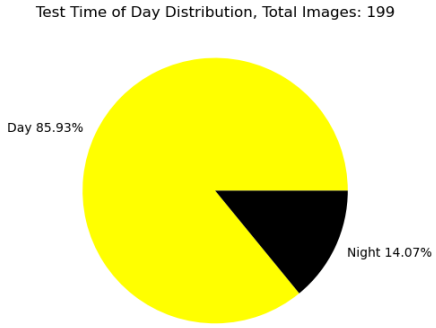
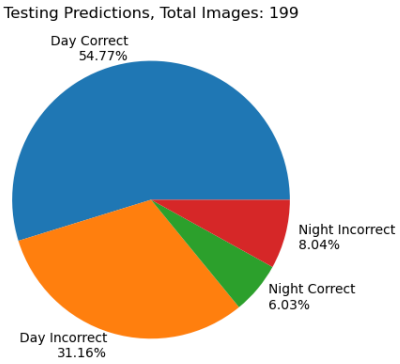
Looking through the images provided by Barry M. Goldwater Range we were able to make some observations about the data we were handling. We noticed that the images were labeled both with their corresponding chip (or camera) value and whether the image was taken during the day or at night time, along with the animal in the image. There is great contrast in the images that were taken during the day versus at night, the ones taken at night were gray scale, and the daytime images the brightness of the image varied based on the time of day. We decided to split the data into the training and testing set using the leave one out method, or rather in our case leave all but one out. We parsed our the chip value, which are all unique to the camera that took the image and split the data based on that. There were six chips total. We trained the neural network on chip01 which contained the highest number of images and then tested it on the other five chips. The downside of splitting our data this way was that the other five chips did not contain any images of bighorn sheep, bobcats, coyotes, and mule deer.
After running the training and testing we analyzed the distribution of day time and night time images in each dataset. We found that as we trained the model the percentage of incorrect predictions for day and night decreased each epoch. However when we ran the test dataset, the ratio of incorrect predictions was much higher for the night images when compared to the day. The night images were incorrect more than half of the time, while the daytime images were incorrect closer to one fourth of the time. The following figures show the distribution of the day and night data, and the testing predictions.





In addition to analyzing the distribution of results, we calculated the F1 scores for each of the BatchIDs on the testing set. Each time we ran our script we got slightly different F1 scores however they were always between 0.4 and 0.8, this was due to the precision and recall changing slightly. We were unable to reach an F1 score of one due to our test set not containing all of the animals.

There are several goals we hope to achieve during the second part of this assignment. One of them is we are hoping to find a way to split the images into testing and training sets more evenly; doing so would give us more accurate results. If the testing set contained all of the animals we would have a better idea of how accurate the training was after the testing. The other goal, which is our main goal, is to train our neural network to identify and label whether it

is day time or night time in addition to the animal. By doing this we how to minimize the incorrect images for each time of day.

References:

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- https://github.com/aladdinpersson/Machine-Learning-Collection