

## Discussion Questions

### 1. What network/model did you select, and why

In order to achieve transfer learning, Inception v3 model has been used in this task as it is very powerful pre-trained image processing model which is originally trained on ImageNet databases.

### 2. Describe your pipeline and pre-processing steps

#### Pre-Processing Steps:

- Installing Python and different libraries including Tensorflow.
- Creation of training and testing scripts.
- Downloading relevant model and images.

#### Pipeline steps:

- Creating relevant directories that will be used for different parameters.
- Image folders created with names that will be used as labels in image processing.
- Pasting images and model in relevant folders.
- Creating a command to call from command prompt to execute training script.
- Calling training script to train last layer of Inception v3 model on required images.
- Creating directory and pasting test images for classification purposes.
- Creating a command to call from command prompt to execute verification script.
- Calling verification script to verify the output of the trained model.

Verification Script is developed to move all successfully classified images of cat from 'test\_set' folder to a separate folder named, 'cat\_images'.

### 3. What steps did you take to get the best accuracy

The model was trained on 12500 different images of cats to ensure accurate results.

### 4. How long did your training and inference take, how could you make these faster?

It took around 2 hours to train the model on 12500 images of cats. Performance can be enhanced if the process is carried out on a computer that has GPU. Moreover, algorithms could be analyzed for optimization purposes.

**5. If you had more time, how would you expand on this submission?**

I would have worked to improve 2 aspects of image processing, one is performance and the other one is accuracy. This is just to ensure that the best possible outcome is always achieved with respect to the input provided.

As far as performance is concerned, I would have spent more time to ensure the algorithms are optimized.

For accuracy, I already ensured to use a large dataset for training purposes. Further, I would have extracted more information from existing data as the new features may have high ability to explain the variance in the training data, ensuring accuracy. Moreover, results of multiple models could be used to ensure prolific results, along with verifying algorithms for accurate outputs.

Finally, all the research done so far on image processing could also be analyzed in order to make certain that the best possible outcome is achieved whilst ensuring any further improvements to the research if could be made.