# BITS F464 - ML Assignment -3

## Neural Networks to classify Dog and Cat images

**Group Members:**


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# Confusion Matrix

| Predicted | Dog | Cat | Total |
|---|---|---|---|
| Actual | | | |
| Dog | 11788 | 00712 | 12500 |
| Cat | 11462 | 01038 | 12500 |
| Total | 23250 | 01750 | 25000 |

Assuming Dog =Positive Class and Cat=Negative Class
TN = 01038 FP = 11462 FN = 00712 TP = 11788
Accuracy = (TP+TN)/(TP+FP+FN+TN) = 0.51304
Precision = TP/TP+FP = 0.50701
Recall = TP/TP+FN = 0.94304

F1-Score = 2*(Recall * Precision) / (Recall + Precision) = 0.65947

**Remarks:-**

**Since images are a complex dataset, Logistic Regression (equivalent to one hidden node one hidden layer neural network) is not expected to perform as good as our one hidden layered five hidden node neural network. On the other hand, a multi-hidden-layered neural network is expected to improve the model's accuracy on the dataset. Performance parameters also improve if we increase the number of hidden neurons as well as switch to more advanced activation functions.**

# Comparison with different configuration of Neural Nets

| Configuration | Precision | Recall | F-Score | Accuracy |
|---|---|---|---|---|
| Logistic | | | | |
| 1-Layer | | | | |
| 2-Layer | | | | |
| 3-Layer | | | | |

**Remarks:-**