

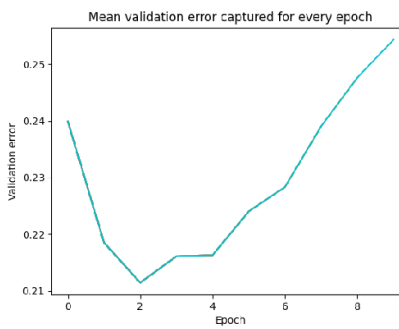
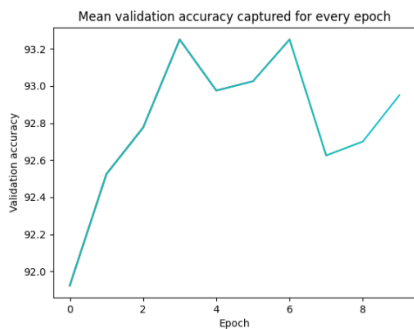
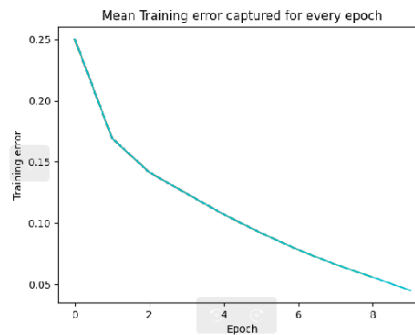
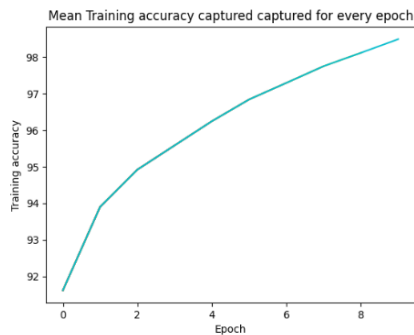
# Assignment 1: Computer Vision

**Kiran Kumaraswamy**

Note: All models are saved in “results/savedmodels” directory and logs of the execution is in logs directory and plots are in plots directory in the code.

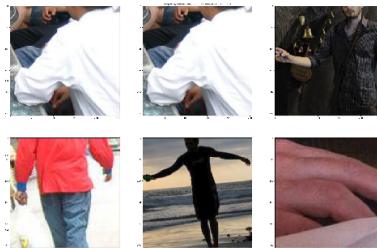
## Task1: Self-supervised Pre Training

- The pretraining task was trained for 10 epochs
- Best validation results were achieved after epoch 6. loss = 0.2114 and miou=93.2499.



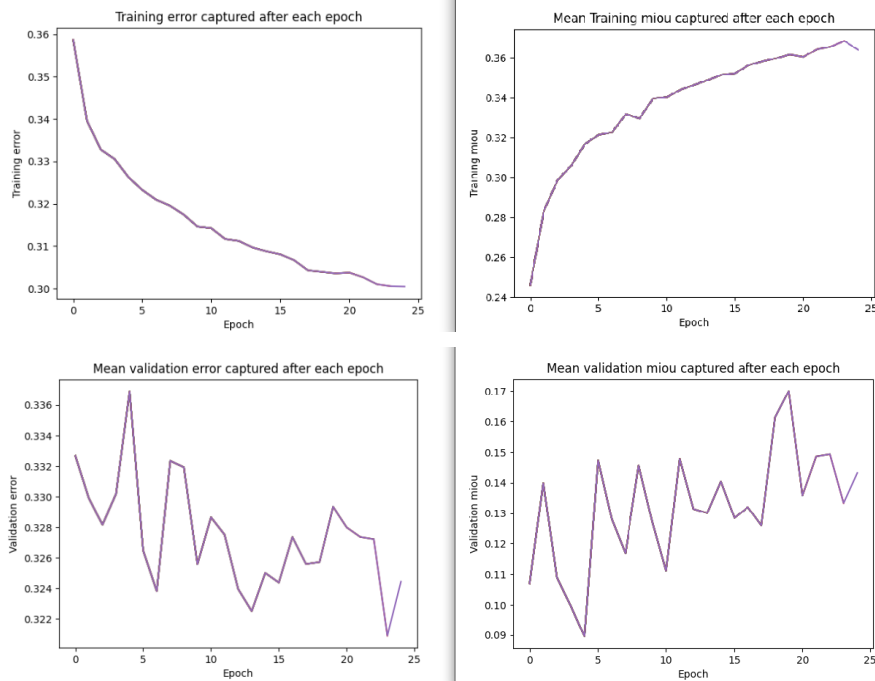
## Nearest Neighbors

- After running nearest neighbour estimation among the top 5 results, 1 image is the input image and the rest of the 4 images share some features with the input image.
- Below are the results I obtained after running the code. Some features like leg and hand postures are common among the images. Yes the network has learned the feature representations.

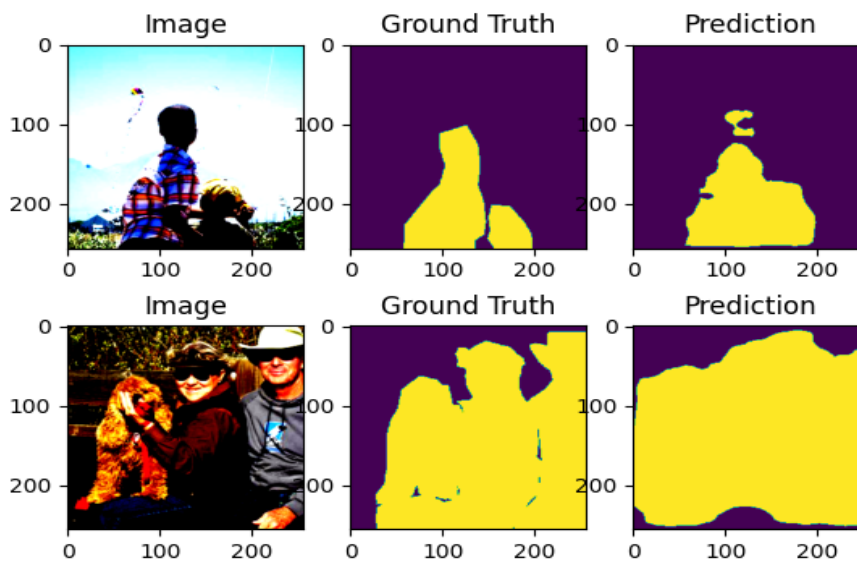


## Binary Segmentation

- The network is trained for 25 epochs and the best result in terms of miou is achieved at 19th epoch.
- Best validation loss = 0.3209 and miou = 0.1700

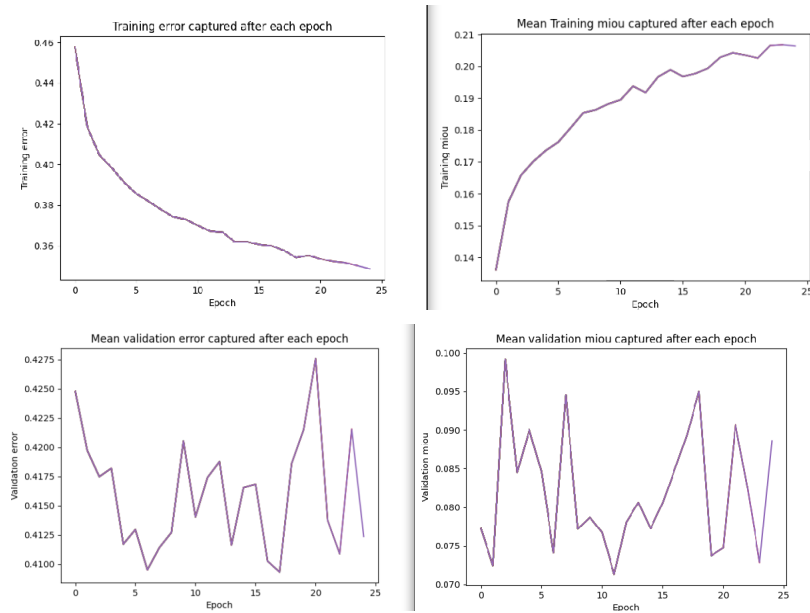


- Qualitative results

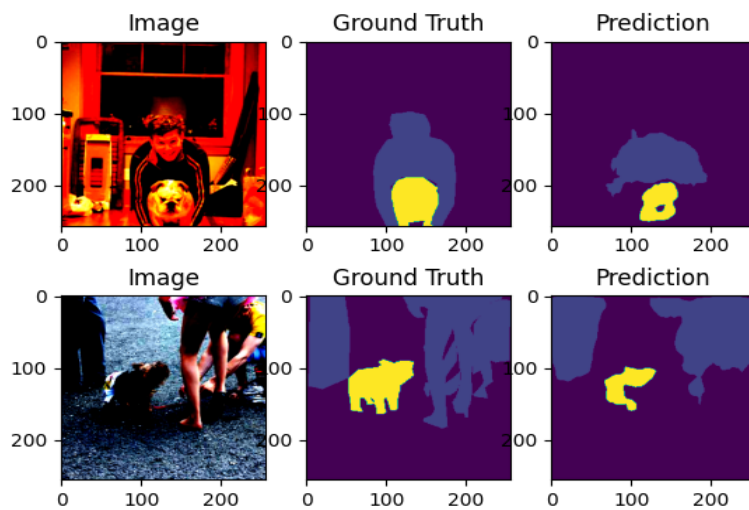


## Task2: Classical pixel-wise semantic segmentation

- The model is trained for 25 epochs and the best result in terms of validation is achieved in 18 epochs without considering initial peak. Loss = 0.4185 and miou = 0.0950. In my case the model doesn't look generalized. Probably with better regularization the curve would be more smooth and model might have generalized well.
- The results attached were trained using the provided binary\_segmentation weights as they result is better compared to my pretrained weights.



## • Qualitative results



**Task 2. Attention-based Semantic Segmentation**

- Dot-product based attention mechanism is implemented.
- Attention layer is implemented.
- dt\_single\_ss.py is implemented to use an attention mechanism. The loss is decreasing as expected, however the mIoU is not increasing.
- Further conclusions cannot be drawn as the accuracy is not increasing.
- I have attached the training logs in the log directory. We can observe that the loss is decreasing as expected. However, the accuracy is not increasing.
- There is a bug in the code I have written for the attention mechanism and hence the results are erroneous. I could have fixed it but my intention for this submission was to provide the results without changing the model code I have written previously.