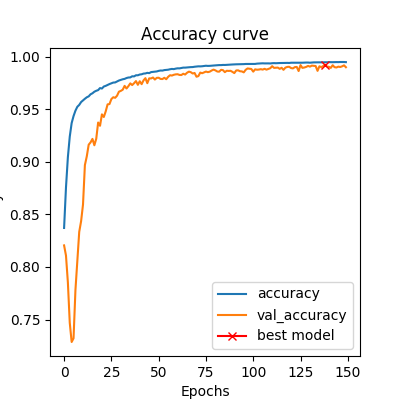
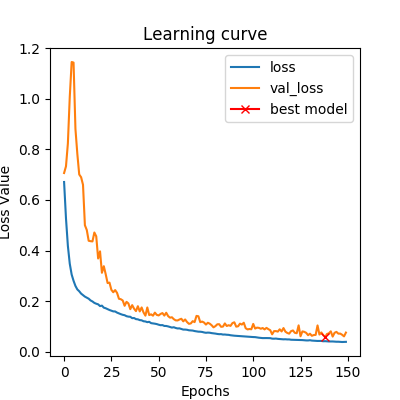
Lab 3

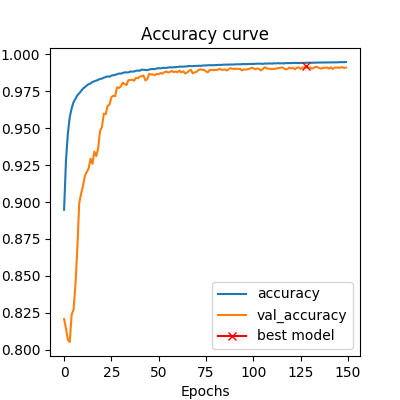
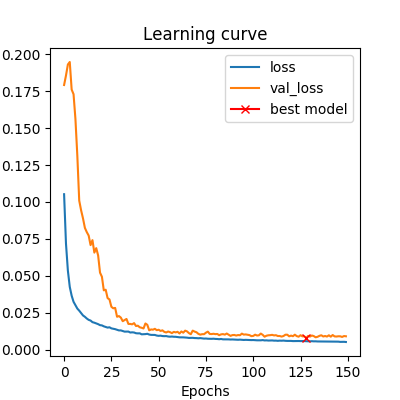
Task 1a

Lung Segmentation in Chest X-ray Images – Metric- Dice Coefficient

Loss Function- Binary Cross Entropy

Task 1b

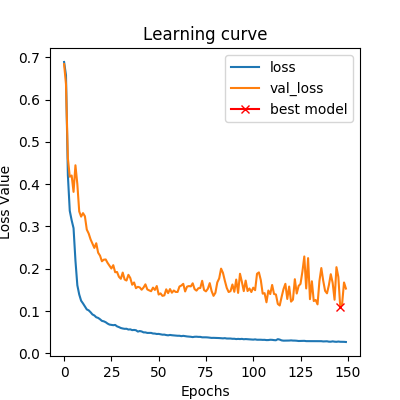
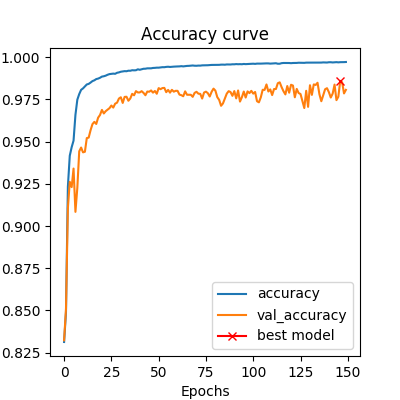
Lung Segmentation in Chest X-ray Images – Metric- Dice Coefficient

Loss Function- Dice Loss

The validation loss for the model with loss function as Dice Loss (0.008) is lower than validation loss for the model with loss function as Binary Cross Entropy(0.077), over 150 epochs.

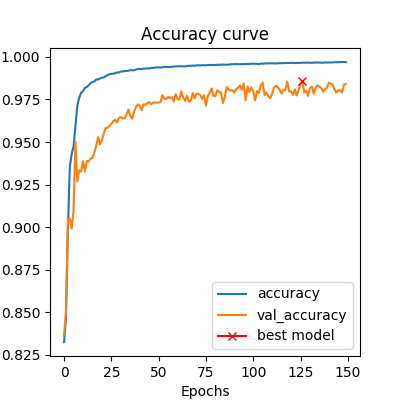
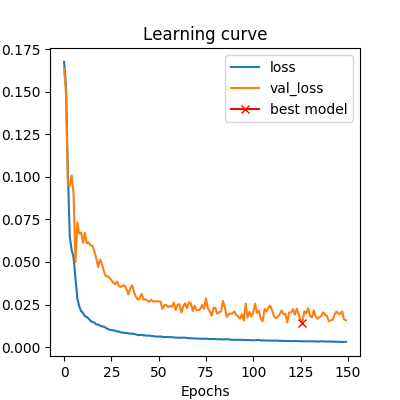
The Dice Coefficient for the model with loss function as Dice Loss(0.99) is higher than the dice coefficient of the model with loss function as Binary Cross Entropy(0.98), over 150 epochs.

Task 2



Lung Segmentation in Chest X-ray Images – Metric- Dice Coefficient

Loss Function- Binary Cross Entropy, without batch normalization

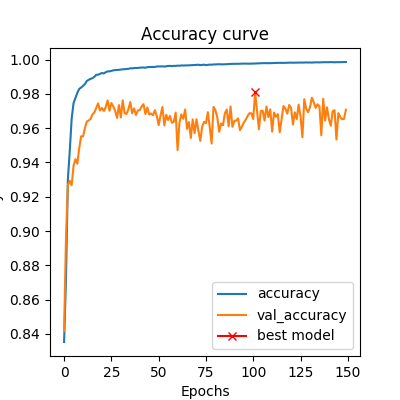
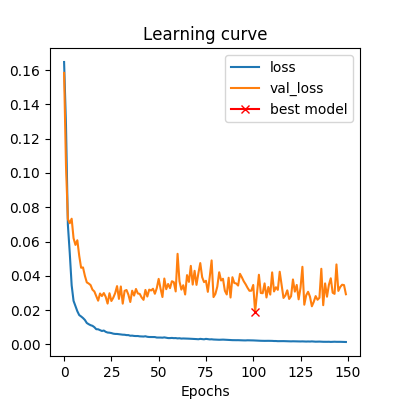
Lung Segmentation in Chest X-ray Images – Metric- Dice Coefficient

Loss Function- Dice Loss, without batch normalization

Removing batch normalization has improved the performance in both the cases (Loss Function – Binary Cross Entropy and Loss Function as Dice Loss), compared to the results in part 1.

The validation loss for the best models with both the loss functions (Binary cross entropy and Dice loss) is lower without batch normalization, which signifies that both the models are performing better without batch normalization.

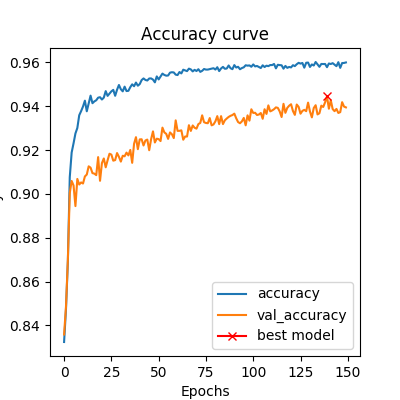
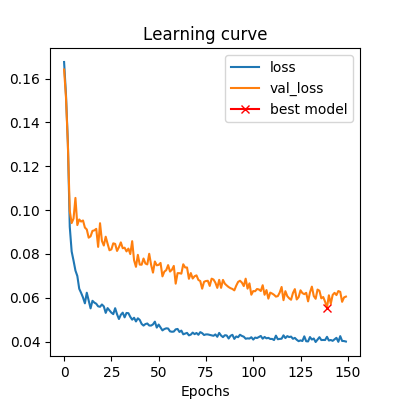
Task 3

The segmentation accuracy ( Dice Score) of the best model on validation set is 0.98 which is higher than the best validation Dice scores of most previous models.

Setting the base to 32 is leading to overfitting and is not imporoving the perfomance of the model that much. Increasing the base too much could lead to overfitting ( like in this case ) and not having a base high enough could lead to underfitting by taking away the network’s power to learn. The best to choose the number of feature maps is finding a compromise between the two situations with hit and trial and then check the model’s performance on a test set.

Task 4

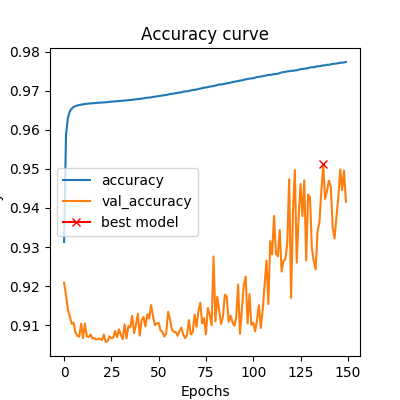
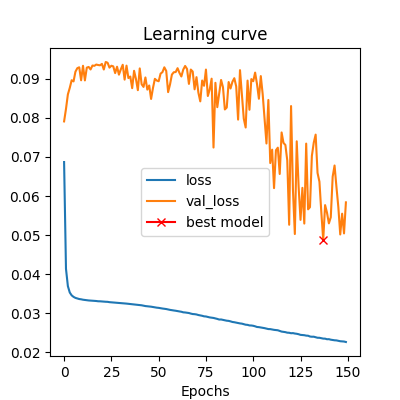
Lung Segmentation in Chest X-ray Images – with best parameters and

Data augmentation

For this particular dataset, the data augmentation does not seem to help as the validaiton dice score of the best model (0.935) is lower than that in Task 3 (0.98). The validation loss of the best model in task 4 (0.06) is higher than the validation loss of the best model in task 3(0.02).

The model in task 4 seems to have a good generalization power as it is not overfitting. Model in task 3 seems to have a better genarilazation power so the model in task 4 is not particularly an improvement.

Task 5a

Lung Segmenation in CT Images

The sementation results of X-ray images are better than the segmentation results of the CT-Images.