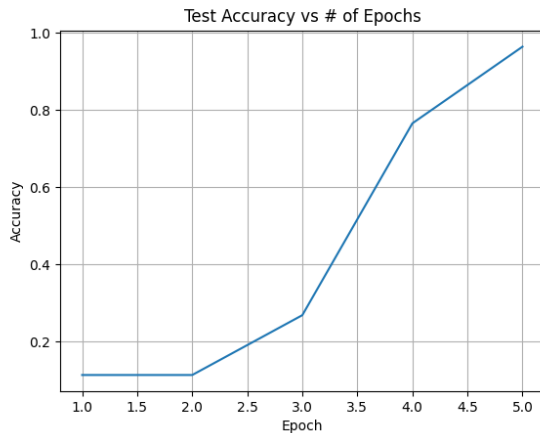
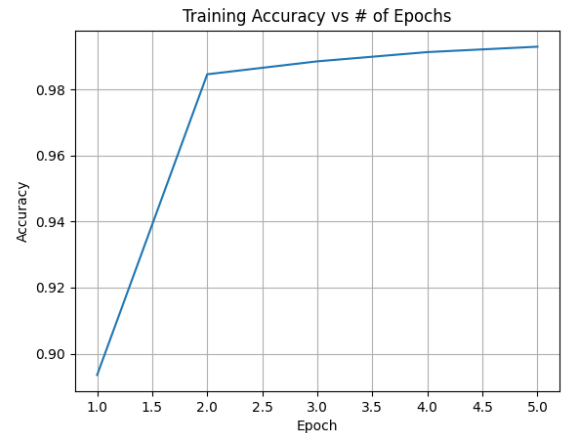


Exercise # 2

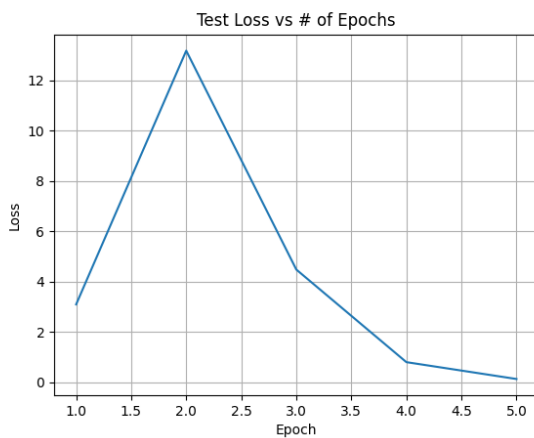
Q2b) Below are the 4 graphs each documenting an aspect of the training and testing process for our VG11 net implimention:



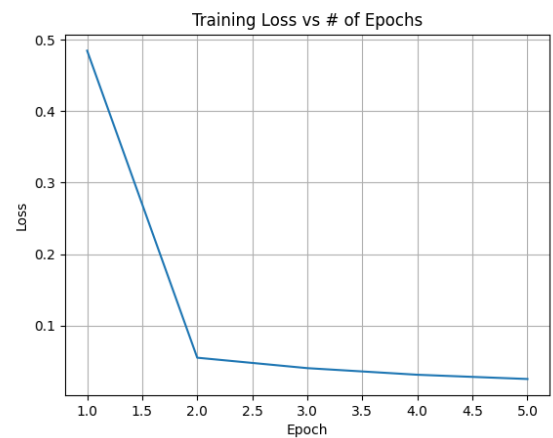
(i) Test accuracy vs the number of epochs



(ii) Training accuracy vs the number of epochs

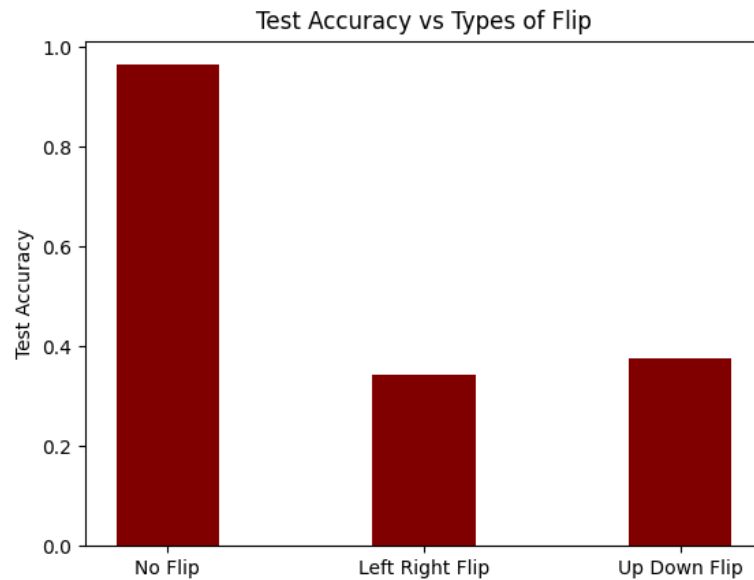


(i) Test loss vs the number of epochs



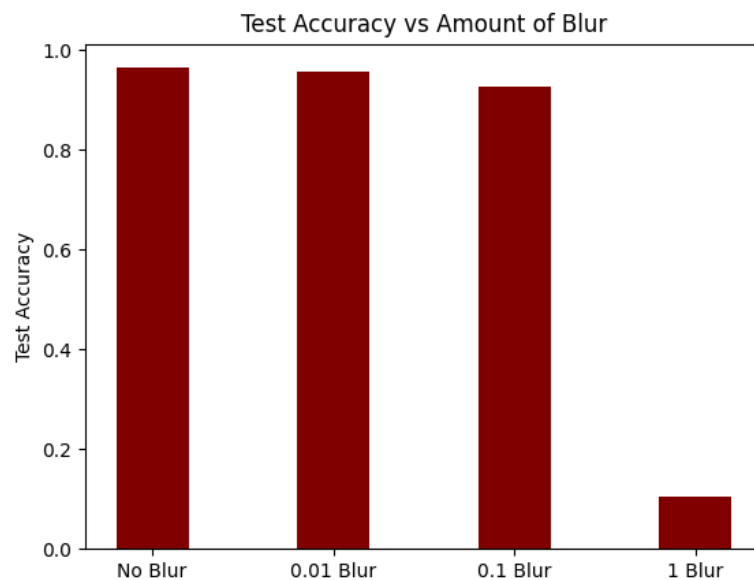
(ii) Training loss vs the number of epochs

Q2ci) Below we can see the testing accuracy across each flip:



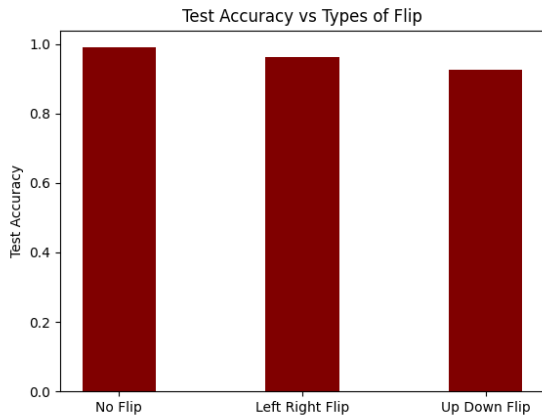
We can see that the updown flip has a higher testing accuracy than the left-right flip, this can be due to the fact that some digits remain more unchanged (like 3) from an updown flip than a right left flip. **Explicit values are provided on the next page.**

Q2cii) Below we can see the testing accuracy across each flip:

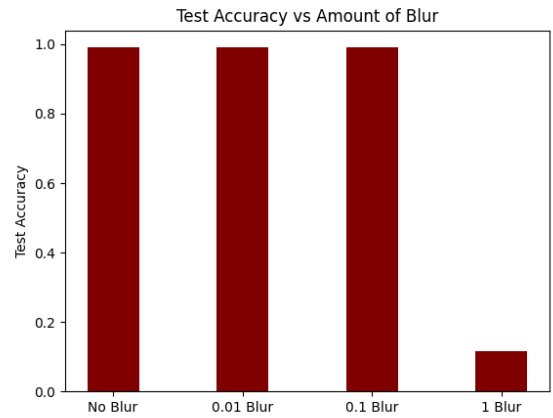


As the amount of blur increases, we can see that testing accuracy decreases. **Explicit values are provided on the next page.**

Q2d) By applying the both times of flips, and 0.01 and 0.1 blurring to our original dataset we can retrain for 5 epochs. After which we get the following graphs.



(i) Test accuracy vs flips



(ii) Training accuracy vs blur

We get the following updated test accuracies:

1. No Flip / No Blur: 0.9899
2. Left Right Flip: 0.9635
3. Up Down Flip: 0.9255
4. 0.01 Blur: 0.9905
5. 0.1 Blur: 0.9907
6. 1 Blur: 0.1159

This is comparison to before we did the retraining where we had the following test accuracies:

1. No Flip / No Blur: 0.9784
2. Left Right Flip: 0.3481
3. Up Down Flip: 0.3755
4. 0.01 Blur: 0.9705
5. 0.1 Blur: 0.9503
6. 1 Blur: 0.1139