

Project #2

Fashion Minst

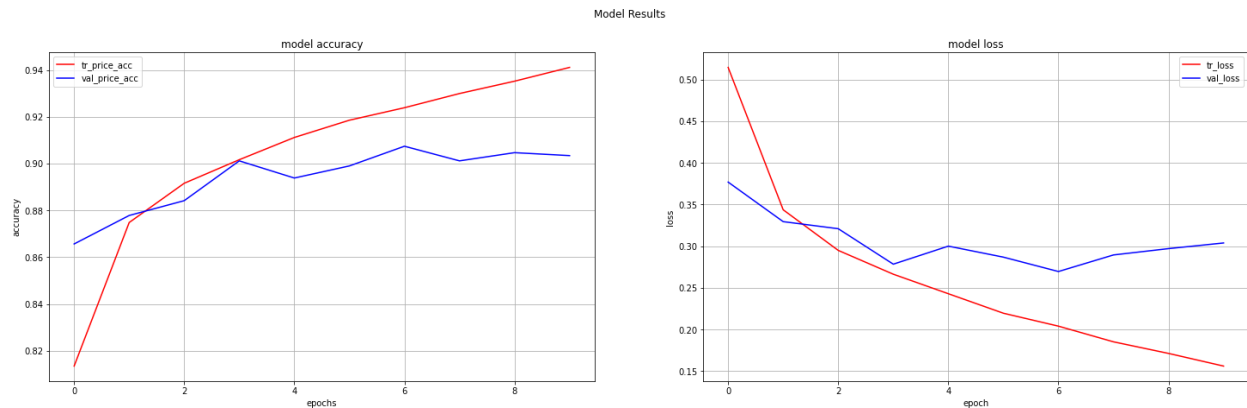
By\ Abdelrahman Magdy El-Hamoly (21AMME1)

Ahmed Mohamed Gaber AbdElaziz (21AMGA)

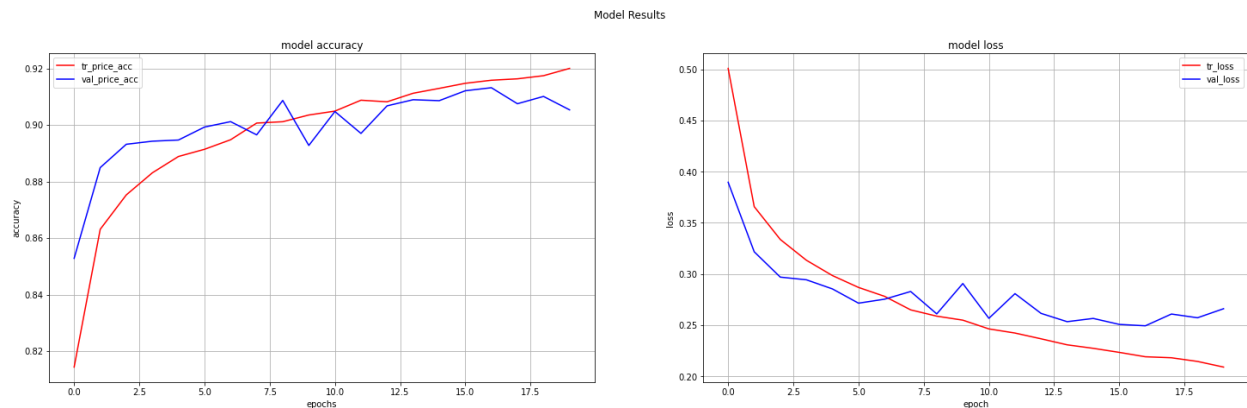
Karim Gamal Mahmoud Mohamed (21kgmm)

LeNet-5 plots

Simple LeNet-5 without hyperparameter tuning



LeNet-5 With hyperparameter tuning



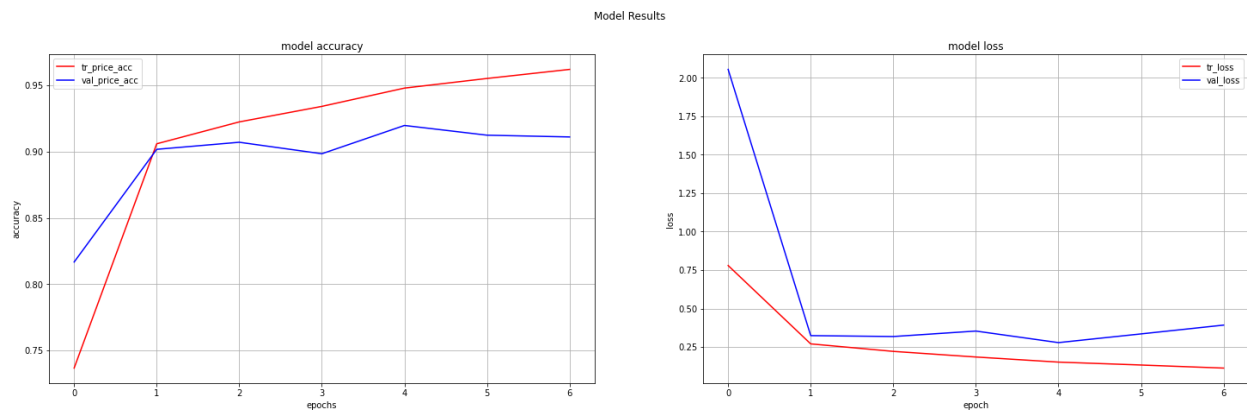
Model	Evaluation - Loss	Evaluation-Acc
Simple LeNet-5	0.270307272672	90.6
LeNet-5 with HP tuning	0.2482645958	90.78
LeNet-5 with cross val	0.6810760498	90.59
LeNet-5 with HP tuning & cross val	0.219912305474	92.46

Comment: As we see from the graphs and the results from the first model, we have very high accuracy on the training data but we have a fair score on validation data but it is far from the

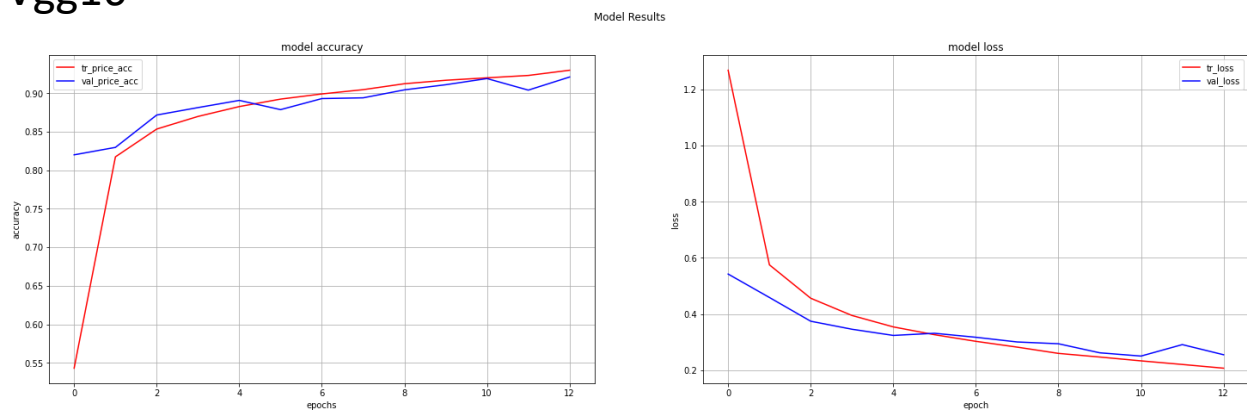
training score so we added some dropout layers to avoid overfitting and it worked as the difference between training and validation score decreased with the increase of validation score by 2%.

LeNet comparison with the other models.

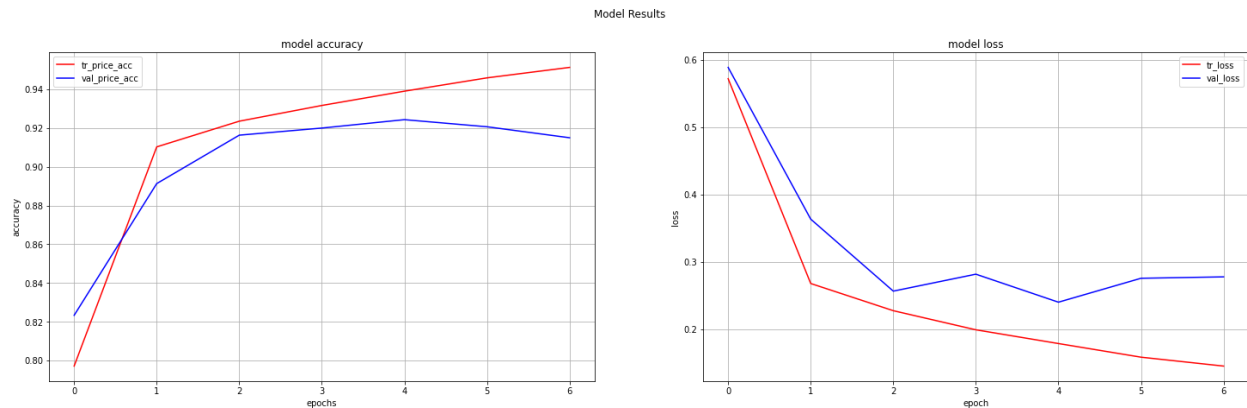
ResNet152V2



Vgg16



DenseNet169



Model	Evaluation - Loss	Evaluation – Acc
Best LeNet-5	0.219912305474	92.46
DenseNet169	0.2855	92.27
ResNet152V2	0.3292	91.67
Vgg16	0.2370	91.92

As we see from all the previous trials, the LeNet is the best model built for these reasons:

- The training accuracy is 94.74% and the evaluation accuracy is 92.46% so they are so close to each other (NO OVERFITTING).
- Has the highest evaluation score.
- Has the least evaluation loss.

References

<https://stackoverflow.com/questions/44475682/cross-validation-in-deep-neural-networks>

<https://www.kaggle.com/code/anandad/classify-fashion-mnist-with-vgg16>

<https://www.kaggle.com/code/crawford/diagnose-lung-disease-with-vgg16/notebook>

<https://www.kaggle.com/code/omarsalahhemied/fashine-mnist-with-vgg16-densenet169-resnet152v2>

<https://www.programcreek.com/python/example/92213/keras.applications.vgg16.VGG16>

<https://www.socouldanyone.com/2013/03/converting-grayscale-to-rgb-with-numpy.html>