Report

Furniture Identification using Convolutional Neural Network (CNN)

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Dataset: A multi classification data was collected from Kaggle website, which consisted of 5 classes which are furniture types that are bed(0), chair(1), sofa(2), swivel chair(3) and table(4).





Objective: The objective of the project is to build a CNN model which will help to identify the types of furniture.

Training data	4014 images
Testing data	423 images
Validation data	10 images

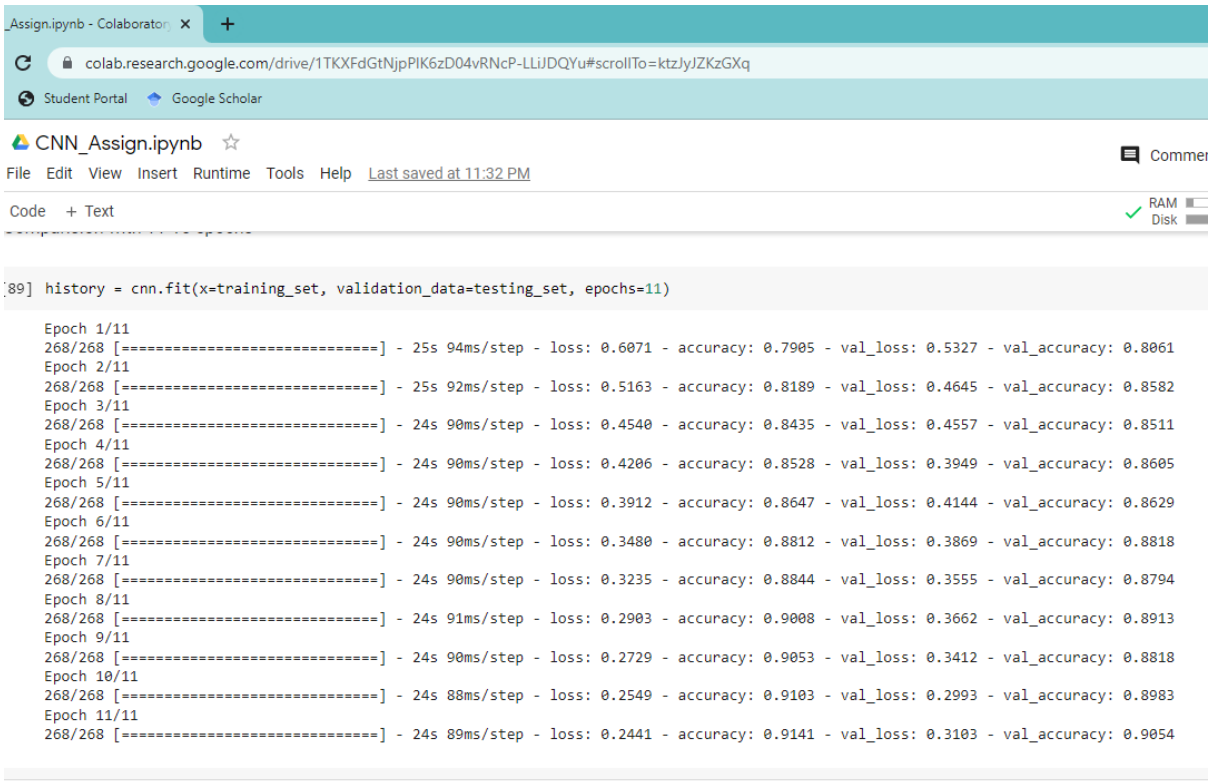
Steps used for building CNN model:

1. Data was loaded into training and testing data using ImageDataGenerator library.
2. Then initialise CNN model using tensorflow library.
3. Applied 2 convolutional layers with 32 filters.

4. Then applied 2 max pooling layers with size of 2 and strides of 2.
5. Applied activation function as ‘relu’.
6. Applied flattening layer.
7. And finally, an output layer with 5 units because of 5 classes, by applying ‘softmax’ activation function.
8. The optimizer used for model is ‘adam’ and used categorical cross entropy for mutli-classification problem.

Results:

I tried training the model using 3,5,11,15,25 epochs but got less cross_entropy and higher accuracy for 11 epochs which is as follows.



Below, is table of accuracies and loss.

Training loss	**0.24**
Validation loss	**0.31**
Training accuracy	**0.91**
Validation accuracy	**0.90**

Image 1

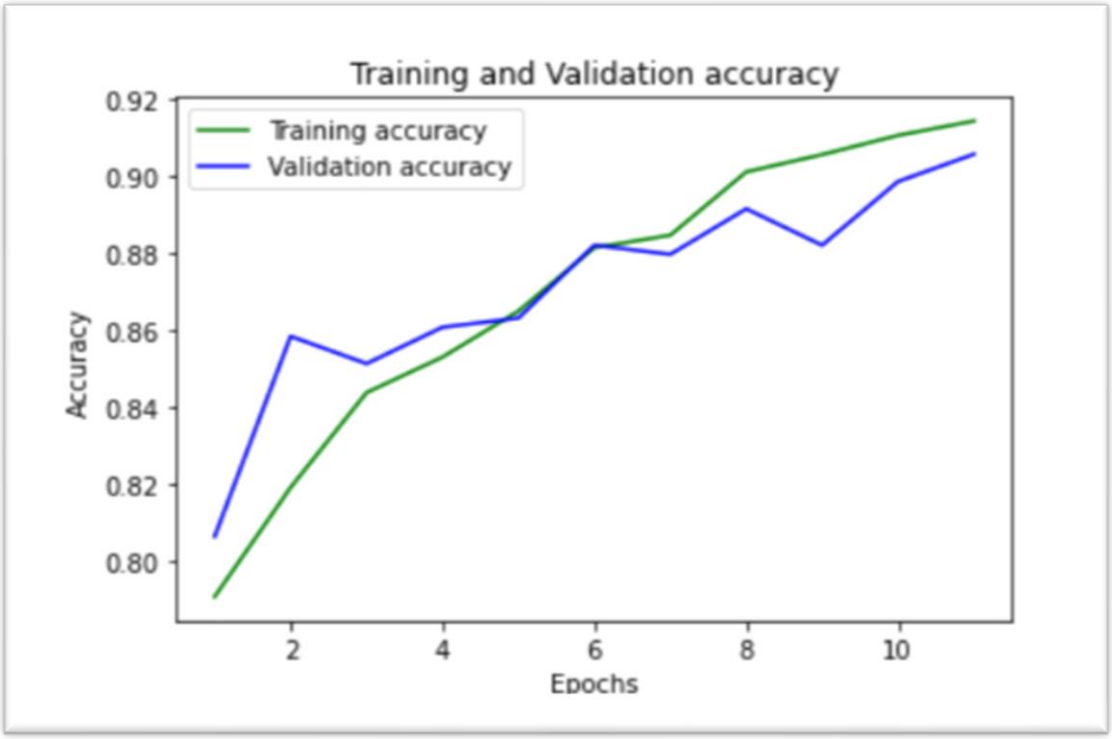


Image 2

From above images we can get a clear idea about losses and accuracies, it could be easily interpreted from image 1 that training loss as well as validation loss are decresing as epochs are increasing. And from image 2 this can be interpreted that training accuracy and validation accuracy are increasing along with epochs.

Model Evaluation:

For evaluating model 10 images were used, out of which 9 images were identified correctlya and 1 image was missclassified.