Model Write up (Justification Sheet)

Model No.	Model	Description	Result	Decision + Explanation
Note: During fitting of several models following issue were observed: Resource exhausted (OOM) to deal with this issue notebook saved till output of that cell. Kernel reset and again started fitting of same model followed by running of required cell of respective Model.				
1	Simple Conv3D	Batch Size: 40 No of Epoch: 10 Parameters: 25,749,637	Cat accuracy: 0.8907 Val accuracy: 0.5417	a) Model is over fit b) Let us try Batch Normalization with Conv3D c) Increase no of epoch
2	Conv3D with Batch Normalization	Batch Size: 40 No of Epoch: 15 Parameters: 20,900,613	Cat accuracy: 0.9927 Val accuracy: 0.2250	a) Model is over fit and early stopping and accuracy is not increasing with each epoch b) Include Dropout c) increase no of epoch
3	Conv3D with Batch Normalization, Dropout	Batch Size: 40 No of Epoch: 20 Parameters: 20,900,613	Cat accuracy: 0.9431 Val accuracy: 0.1667	a) Model is still over fit and early stopping and accuracy is not increasing with each epoch b) Add Global Average Pooling c) Reduce parameters
4	Conv3D with Batch Normalization, Dropout, Global Average Pooling	Batch Size: 40 No of Epoch: 30 Parameters: 712,453	Cat accuracy: 0.9052 Val accuracy: 0.1917	a) Val accuracy improved but model is still overfitting b) Change no of epoch c) Try with Conv LSTM method with reduced parameter
5	Conv2D + LSTM	Batch Size: 40 No of Epoch: 40 Parameters: 124,165	Cat accuracy: 0.8455 Val accuracy: 0.1500	a) Model is still over fit and early stopping and accuracy is not increasing with each epoch b) Try with GRU with reduced parameter with same batch size and epoch

6	Conv2D + GRU	Batch Size: 40 No of Epoch: 40 Parameters: 99,845	Cat accuracy: 0.8688 Val accuracy: 0.5417	a) Val Accuracy is increased but model is over fit b) Use transfer learning to improve Val accuracy. c) Change no of epoch
7	TranferLearningVGG16 + LSTM	Batch Size: 40 No of Epoch: 30 Parameters: 15,053,509	Cat accuracy: 0.9665 Val accuracy: 0.4667	a) Still overfitting. b) Add Batch Normalization
8	TranferLearningVGG16 + LSTM with Batch Normalization	Batch Size: 40 No of Epoch: 30 Parameters: 15,054,021	Cat accuracy: 0.9723 Val accuracy: 0.6167	a) Val Accuracy has increased but Model is Still overfitting b) Change epoch c) Try with GRU
9	VGG16 + GRU	Batch Size: 40 No of Epoch: 20 Parameters: 14,972,357	Cat accuracy: 0.8921 Val accuracy: 0.5417	a) Model is still overfitting b) Try with different transfer learning method c) Change epoch d) Reduce parameter
10	Mobilenet + GRU	Batch Size: 40 No of Epoch: 15 Parameters: 3,693,253	Cat accuracy: 0.9694 Val accuracy: 0.9333	Got best Val accuracy when compare to all above model.

Conclusion:

With different learning method, change in different no of epoch and training parameters from that Model 10 (Mobilenet + GRU) gave best accuracy when compared to all above models.