

Computer Vision Assignment No. 3 Hamza Ali Imran 273922

- Preprocessing

I have written a python script “preprocessing_script.py” to do preprocessing. My script divided the data-set into 3 folders randomly with 70% Training, 15% Test and 15% Cross-validation. Along with division it also resizes all images to 100x100 pixels. While working on data-generators of Keras I was facing problems hence I merged the folders of Validation and Test and divide data into 15% and 15% with data-generators. I have uploaded the preprocessed data-set at the following repository

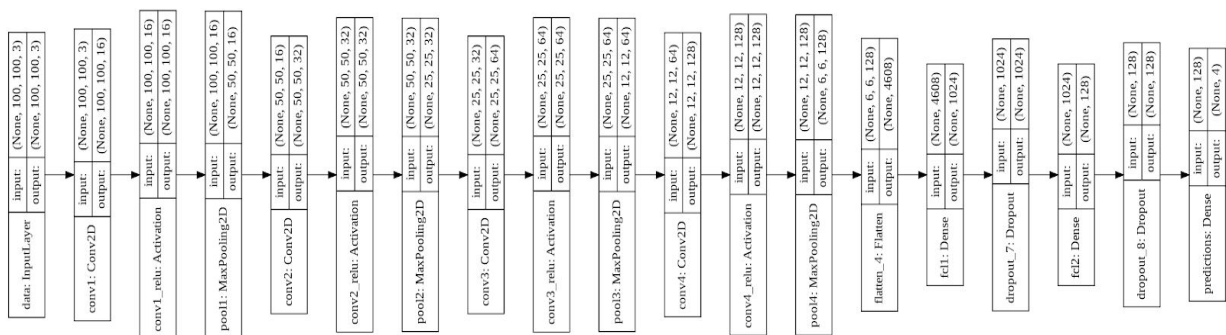
“https://github.com/ibtisam14/preprocessed_dataset.git”

- Training

I have trained a total of 7 CNNs and trying different modifications the best test data accuracy I got was 84.9850 %.

1.

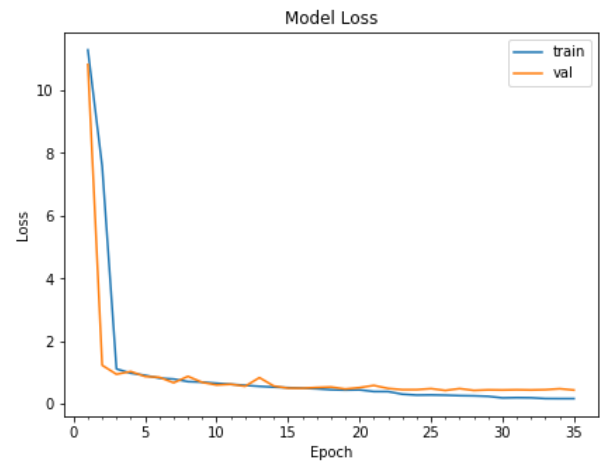
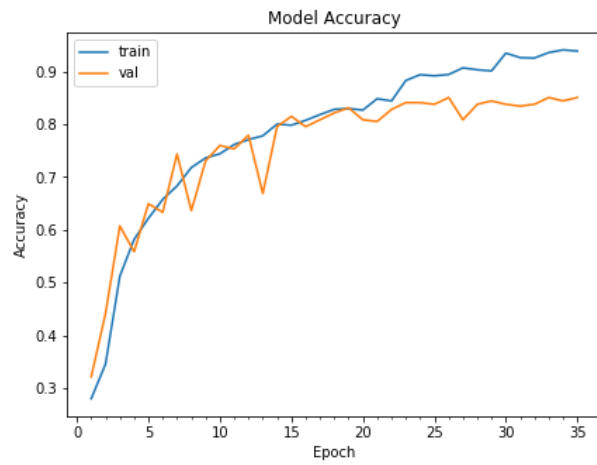
Model



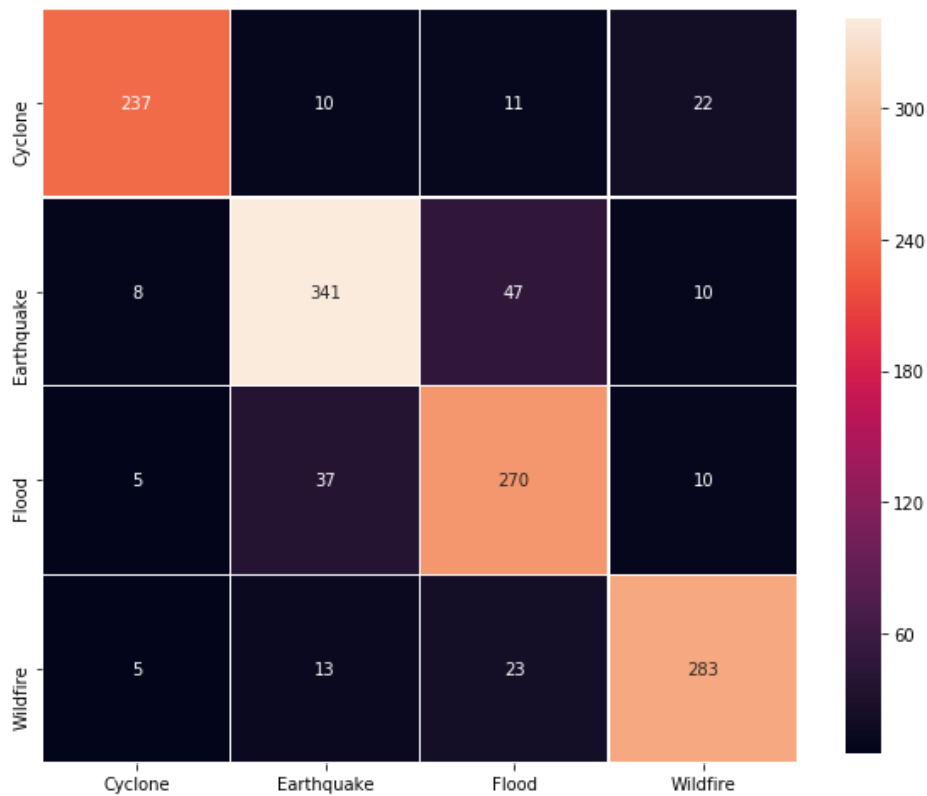
Accuracy & Loss

Validation: accuracy = 0.844156 ; loss_v = 0.464803

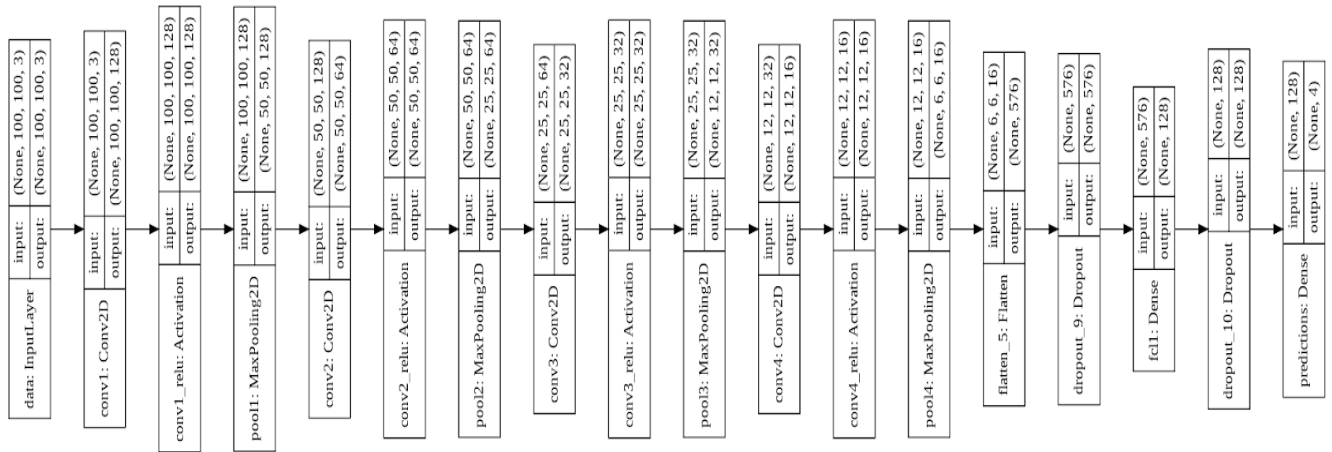
Test: accuracy = 0.849099 ; loss_v = 0.467130



Confusion Matrix



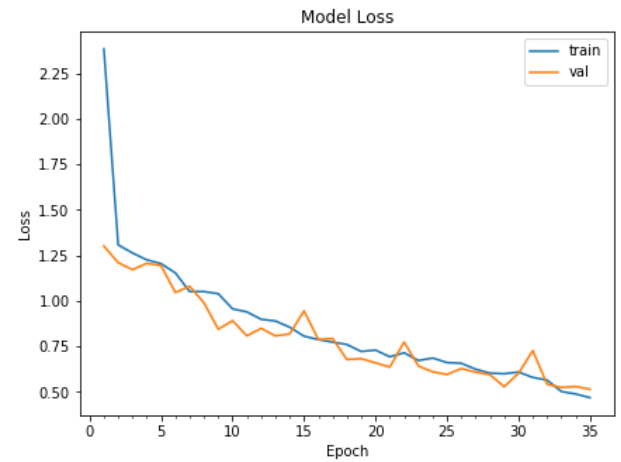
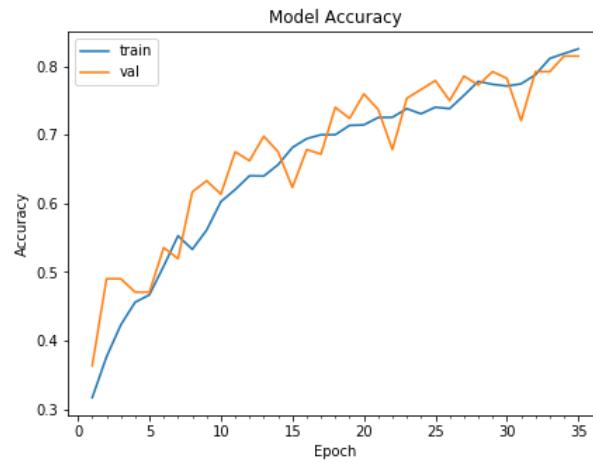
2.
Model



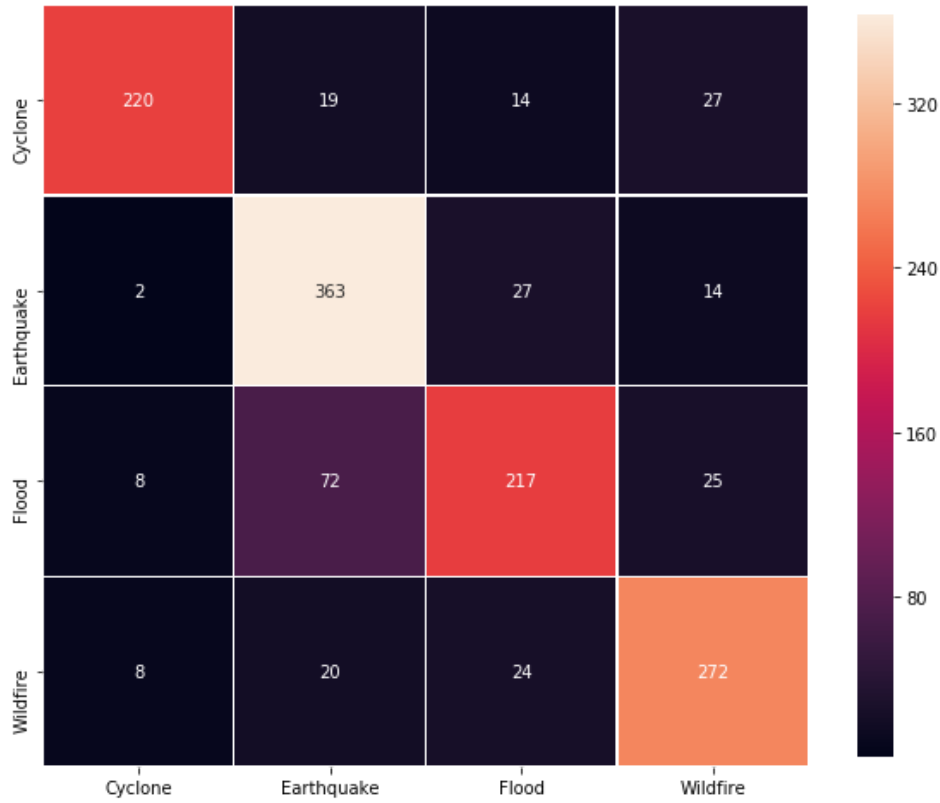
Accuracy & Loss

Validation: accuracy = 0.808442 ; loss_v = 0.494716

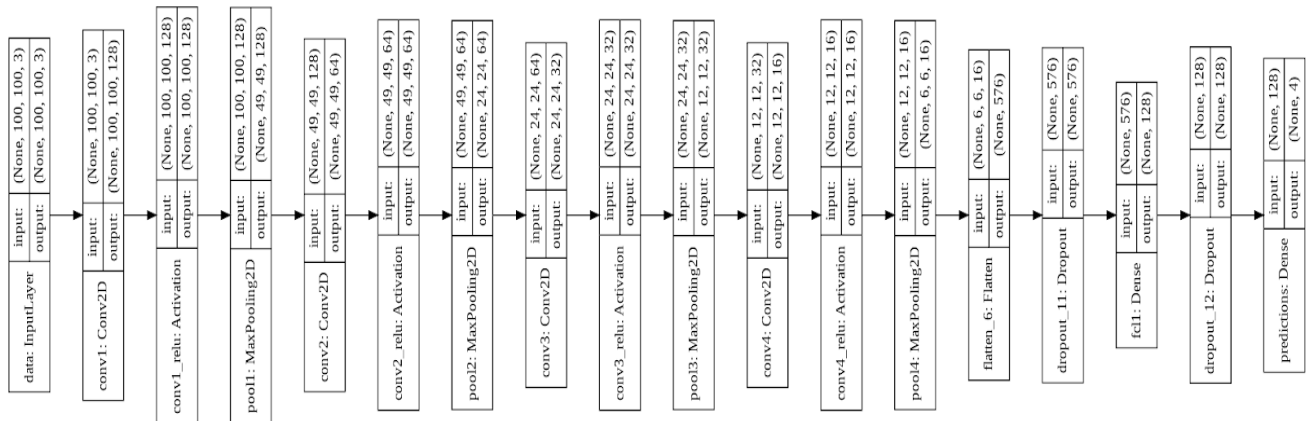
Test: accuracy = 0.804805 ; loss_v = 0.550407



Confusion Matrix



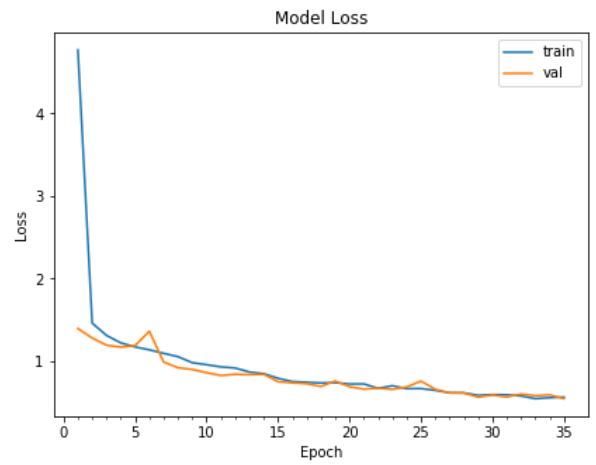
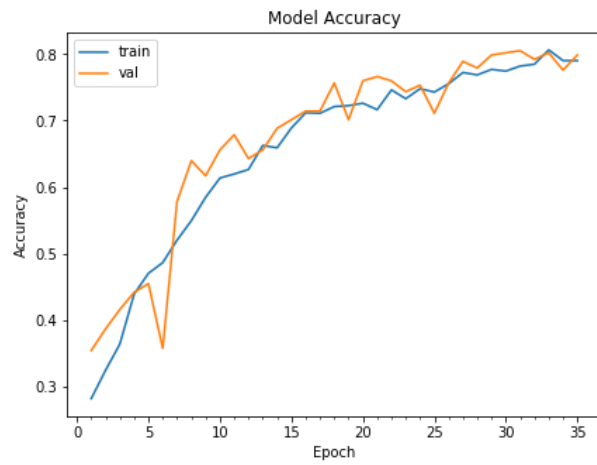
3. Model



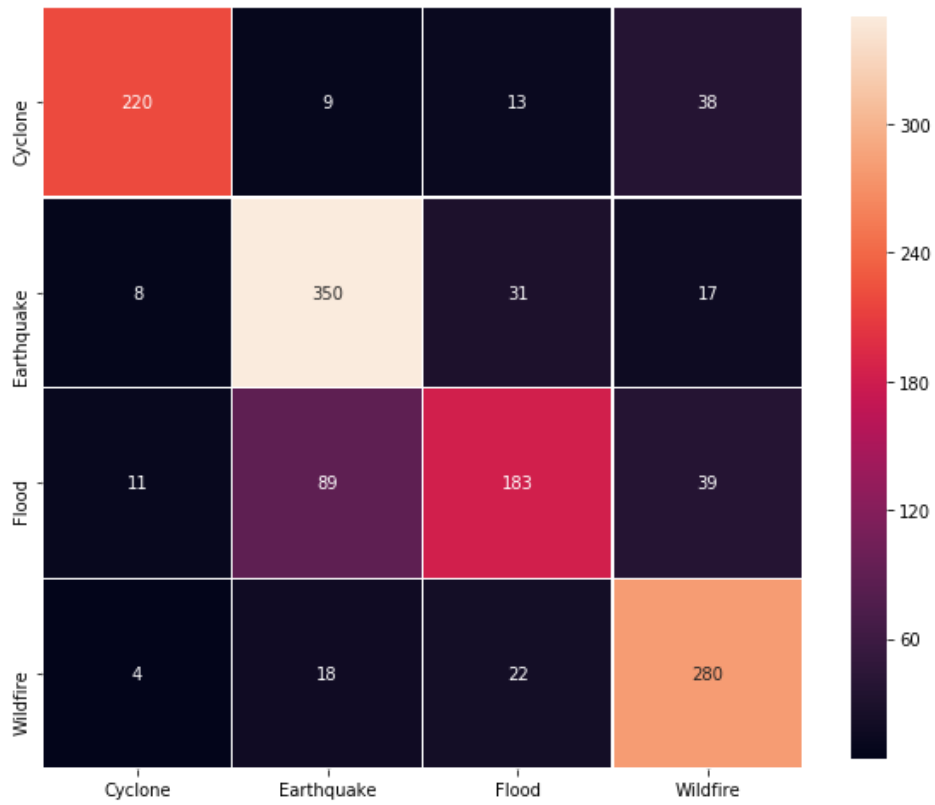
Accuracy & Loss

Validation: accuracy = 0.798701 ; loss_v = 0.574900

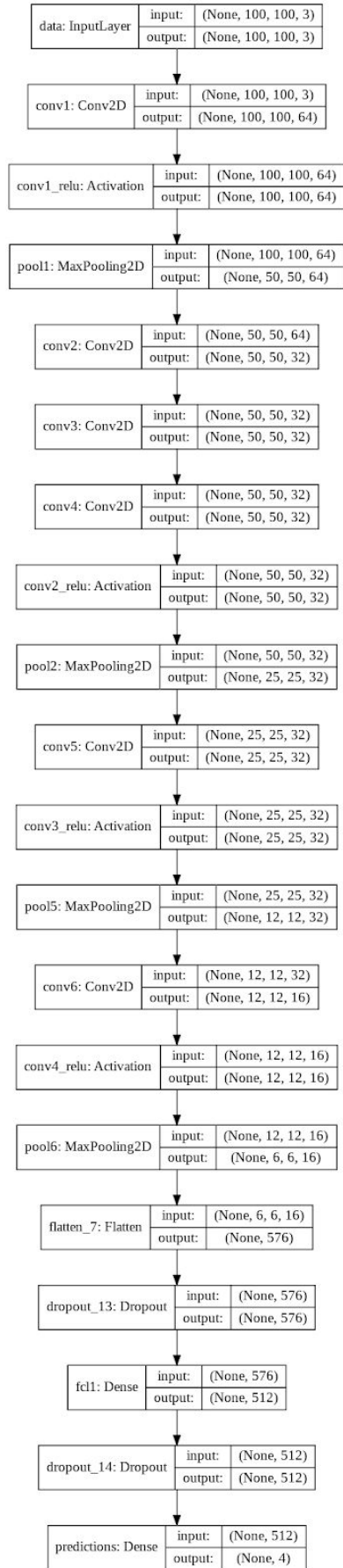
Test: accuracy = 0.775526 ; loss_v = 0.586168



Confusion Matrix



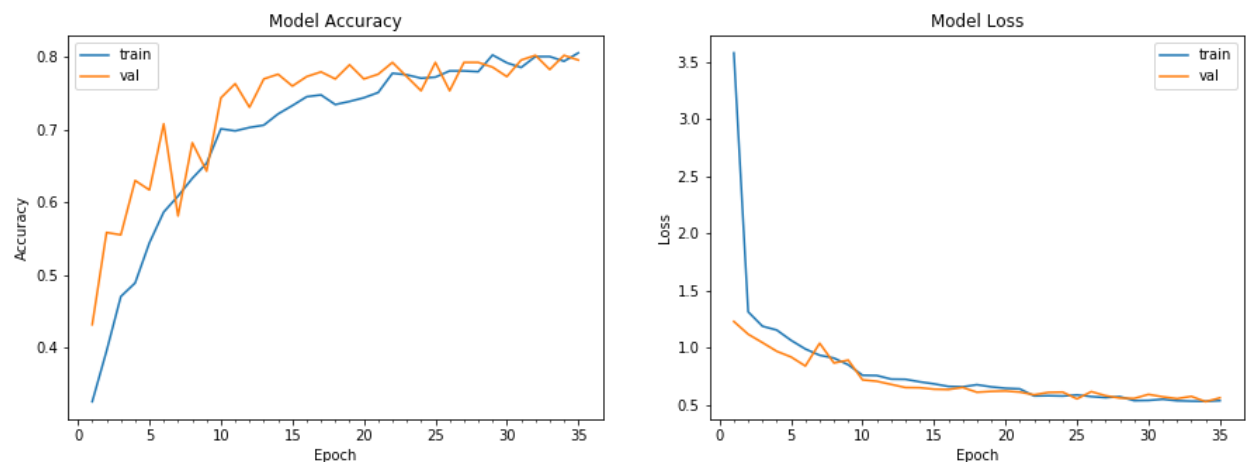
4.
Model



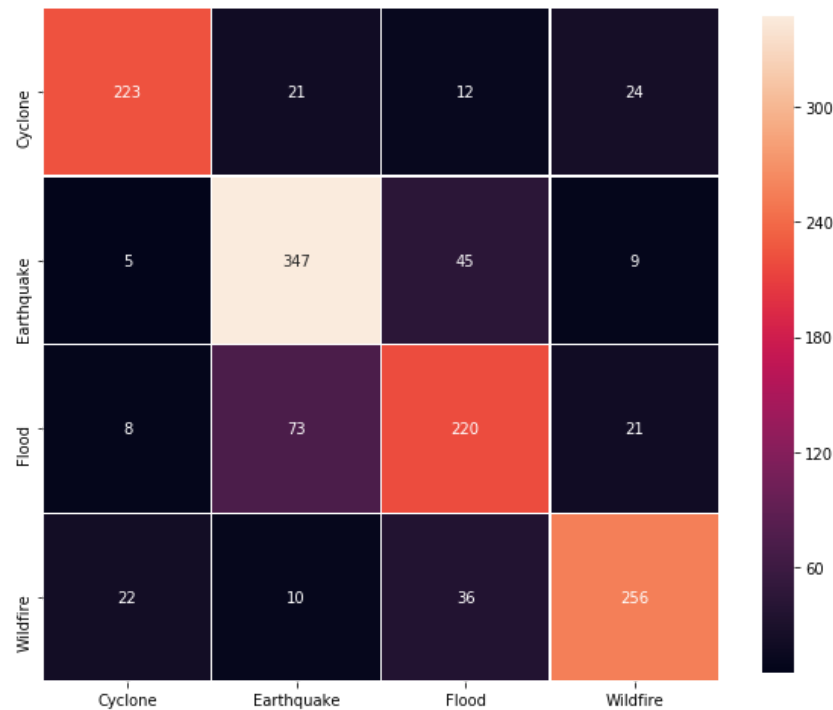
Accuracy & Loss

Validation: accuracy = 0.801948 ; loss_v = 0.534816

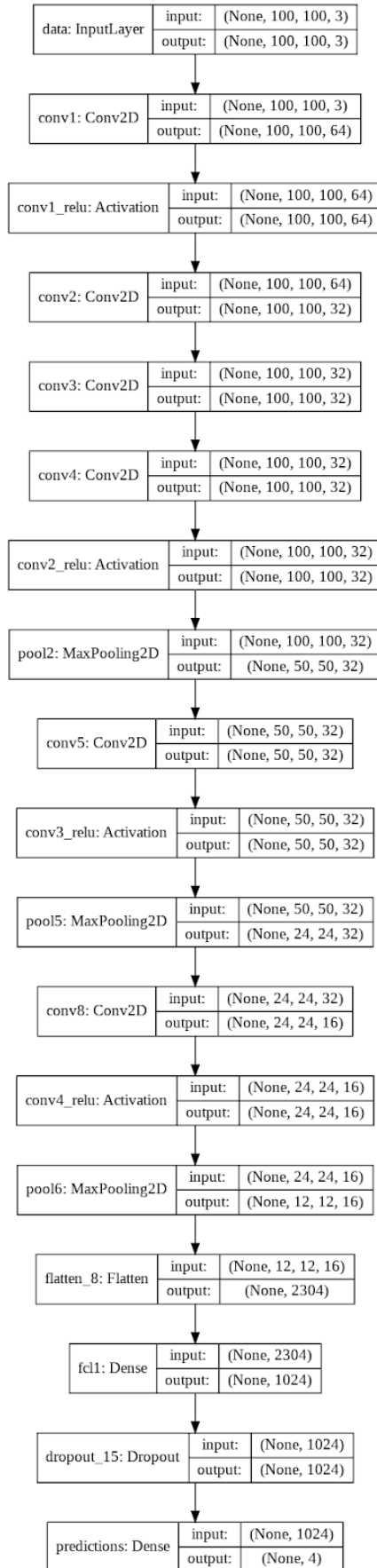
Test: accuracy = 0.785285 ; loss_v = 0.545711



Confusion Matrix



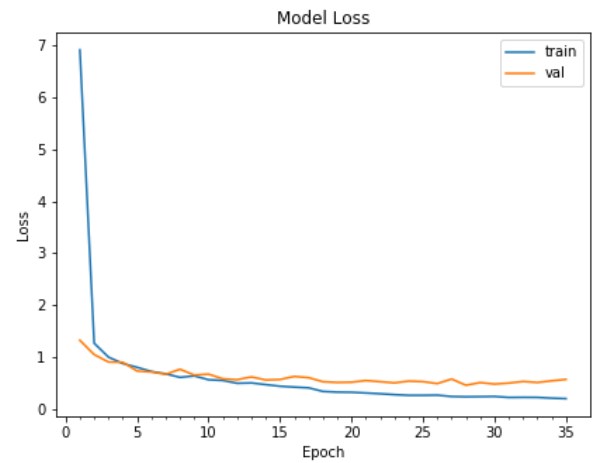
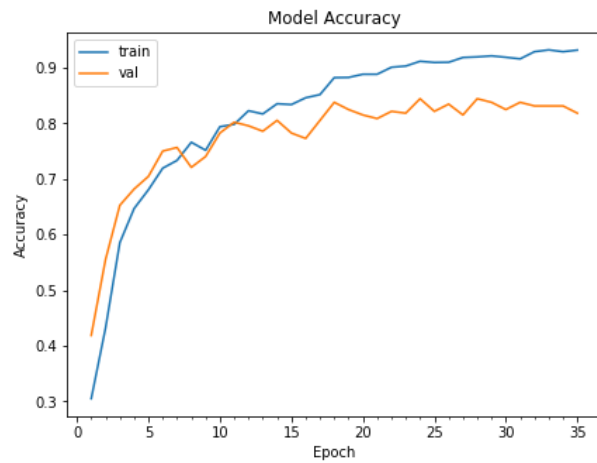
5.
Model



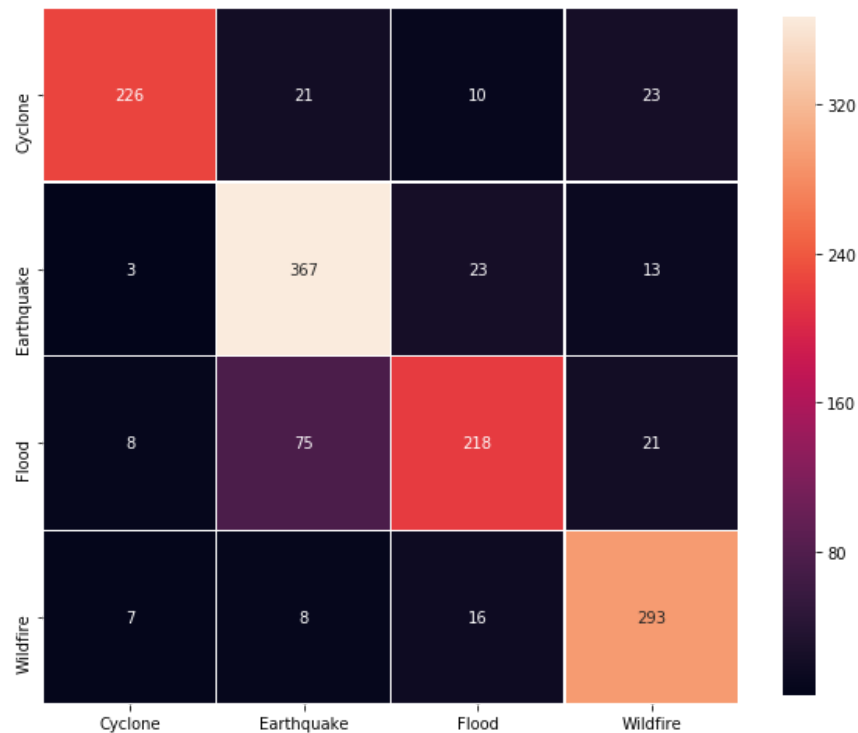
Accuracy & Loss

Validation: accuracy = 0.844156 ; loss_v = 0.522137

Test: accuracy = 0.828829 ; loss_v = 0.487248



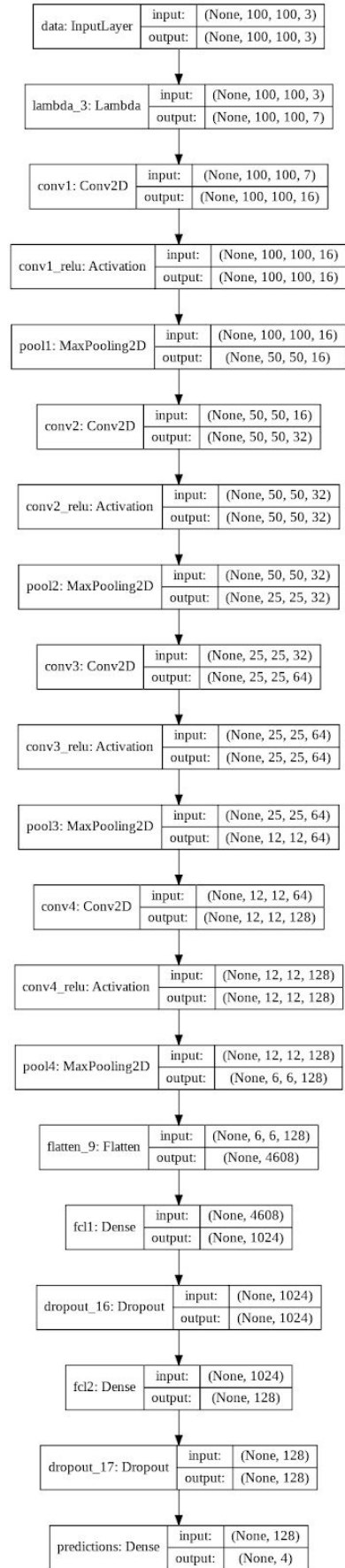
Confusion Matrix



6.

Model

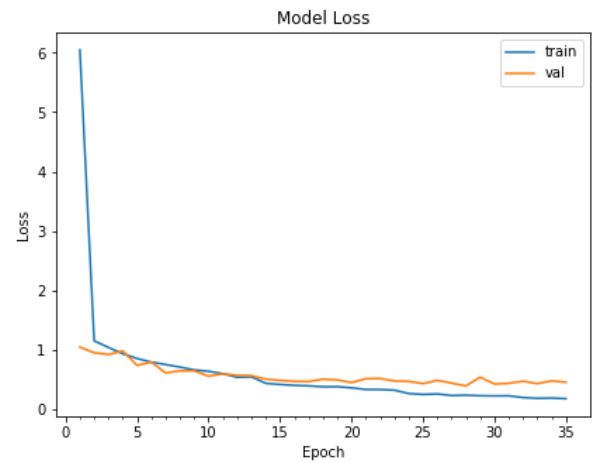
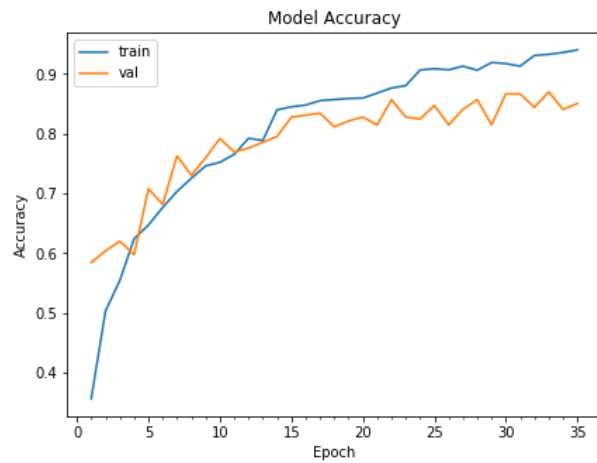
I have first increased the channels of the Image by producing 1 grayscale, 3 HSV and 3 YIQ channels. I concatenated all of these channels and used them for classification.



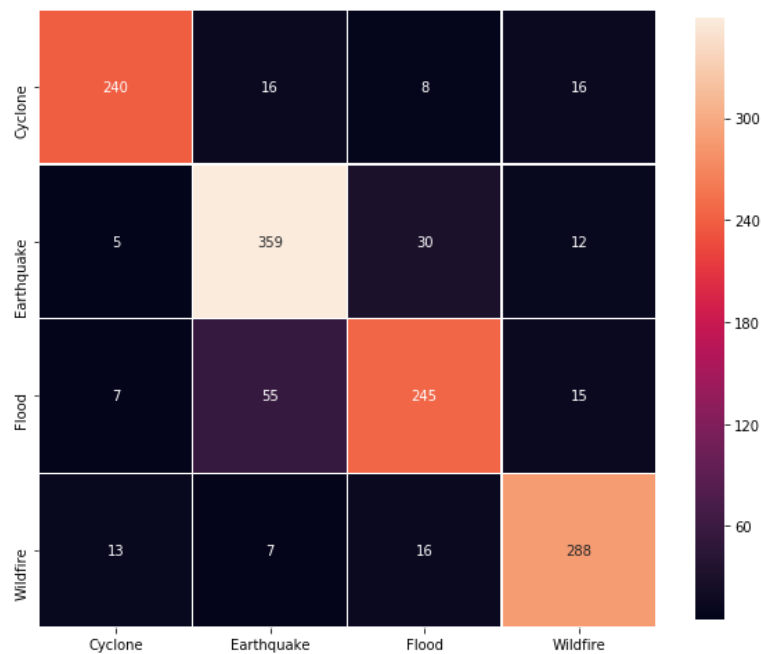
Accuracy & Loss

Validation: accuracy = 0.860390 ; loss_v = 0.471588

Test: accuracy = 0.849850 ; loss_v = 0.436089



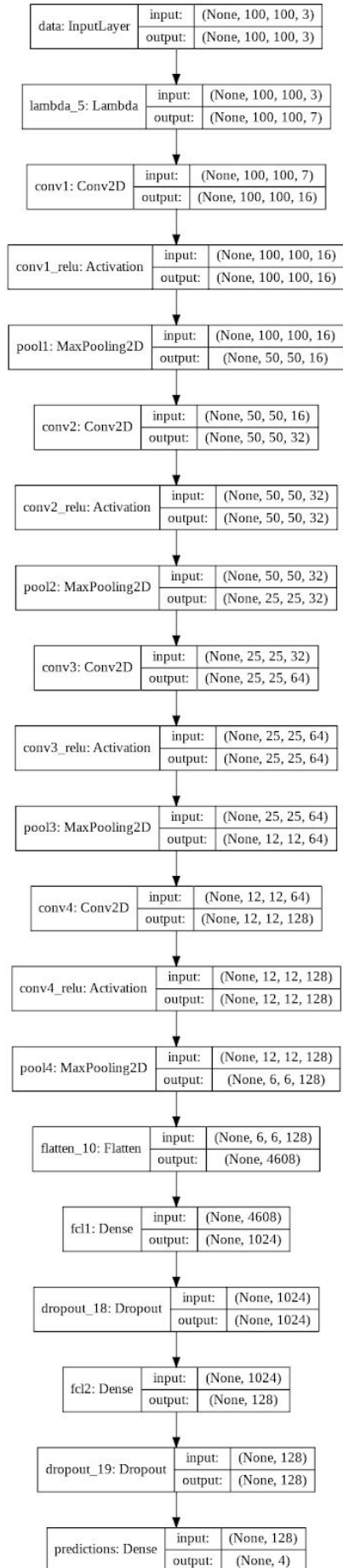
Confusion Matrix



7.

Model

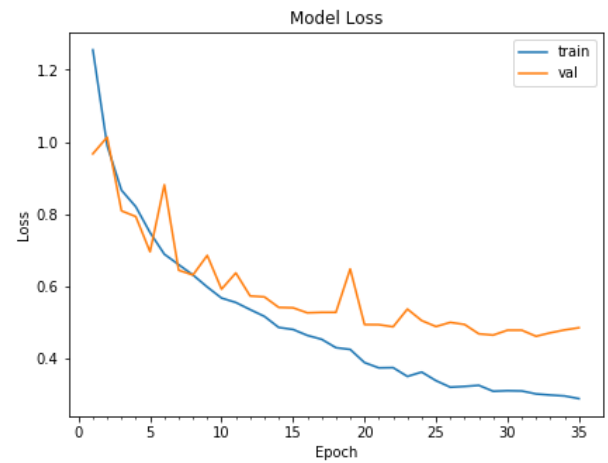
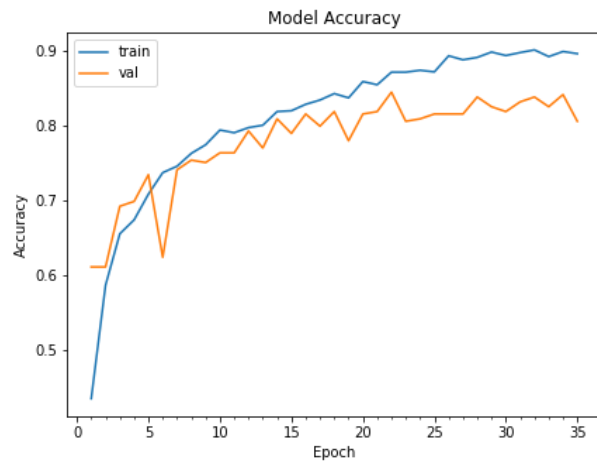
I have changed the activation function from relu to tanh in this one and have also changed kernel size as compared to the 6th model.



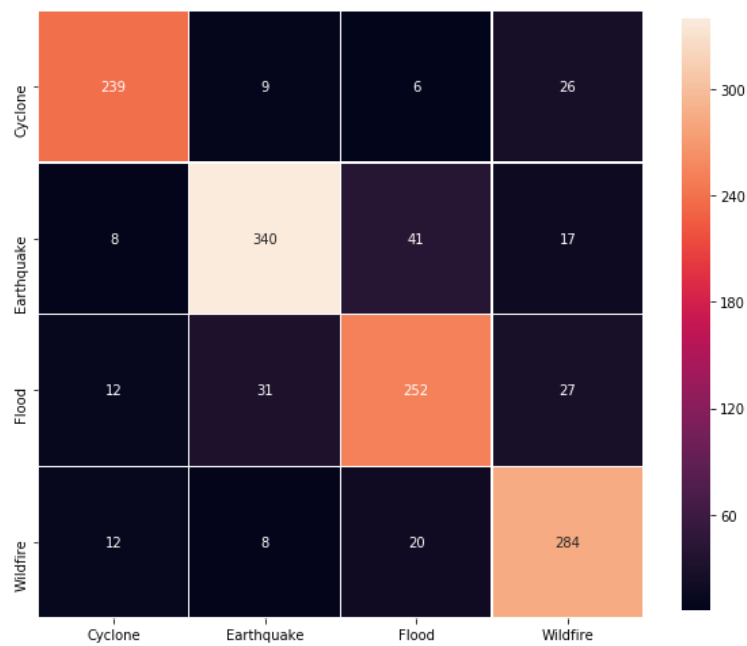
Accuracy & Loss

Validation: accuracy = 0.814935 ; loss_v = 0.497140

Test: accuracy = 0.837087 ; loss_v = 0.465482



Confusion Matrix



I have considered a tutorial of Keras written for Fruit-360 dataset for solving this assignment some of the code is being taken from that tutorial and have being modified to work for my requirements.