Test with hybrid folder:

**CNN ALG:**

**At 20 epoch , modeldatatemp.h5**

Test loss: 0.8985705375671387

Test accuracy: 0.7419354915618896

With no aug

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**At 12 epoch**

No data augmentation

model.compile(optimizer=Adam(lr=0.0001), loss=**'categorical\_crossentropy'**, metrics=[**'accuracy'**])

Test loss: 0.8550137281417847

Test accuracy: 0.6774193644523621

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With validation 0.5 data: at 16 epoch

Test loss: 1.2935922145843506

Test accuracy: 0.6000000238418579

20 epoch with val:

Test loss: 1.3262876272201538

Test accuracy: 0.6000000238418579

**Naïve Bayes:**

[[3 2 0 1]

[0 7 0 0]

[2 2 4 0]

[0 1 0 9]]

0.7419354838709677

precision recall f1-score support

0 0.60 0.50 0.55 6

1 0.58 1.00 0.74 7

2 1.00 0.50 0.67 8

3 0.90 0.90 0.90 10

avg / total 0.80 0.74 0.73 31

**Random Forest:**n est = 100, max depth = 2

[[ 2 3 0 1]

[ 0 7 0 0]

[ 0 2 4 2]

[ 0 0 0 10]]

0.7419354838709677

precision recall f1-score support

0 1.00 0.33 0.50 6

1 0.58 1.00 0.74 7

2 1.00 0.50 0.67 8

3 0.77 1.00 0.87 10

avg / total 0.83 0.74 0.72 31

**KNN: (at k=9 or k=5)**

[[1 4 0 1]

[0 7 0 0]

[2 4 1 1]

[0 1 0 9]]

0.5806451612903226

precision recall f1-score support

0 0.33 0.17 0.22 6

1 0.44 1.00 0.61 7

2 1.00 0.12 0.22 8

3 0.82 0.90 0.86 10

avg / total 0.69 0.58 0.51 31

**SVM:**

[[0 3 2 1]

[1 6 0 0]

[0 2 4 2]

[1 0 0 9]]

0.6129032258064516

precision recall f1-score support

0 0.00 0.00 0.00 6

1 0.55 0.86 0.67 7

2 0.67 0.50 0.57 8

3 0.75 0.90 0.82 10

avg / total 0.54 0.61 0.56 31

CNN with dataaugmentation

datagen = ImageDataGenerator(  
 featurewise\_std\_normalization=**True**,  
 rotation\_range=40,  
 zoom\_range = 0.2,  
 vertical\_flip=**True**,  
 horizontal\_flip=**True**,  
 rescale = 1. / 255,  
 fill\_mode = **'nearest'**)

Test loss: 1.5975441932678223

Test accuracy: 0.22580644488334656

Decision Tree

[[2 2 0 2]

[1 3 3 0]

[2 0 5 1]

[3 0 0 7]]

0.5483870967741935

precision recall f1-score support

0 0.25 0.33 0.29 6

1 0.60 0.43 0.50 7

2 0.62 0.62 0.62 8

3 0.70 0.70 0.70 10

avg / total 0.57 0.55 0.56 31