1) Why split classwise instead of the whole data?

A random split of 50-25-25 might result in a heavily skewed data where some classes would be over or under represented. Hence, splitting classwise would be a better representation of the data as there is an even distribution of samples from every class, reducing bias.

2) Validation accuracies which lead to the selected C

```
C_list = [0.01, 0.1, np.power(0.1, 0.5), 1, np.power(10, 0.5), 10, np.power(100
score = {}
for C in C_list:
    svc = OneVsRestClassifier(LinearSVC(random_state=1000, C = C))
    svc.fit(X_train,Y_train)
    score[svc.score(X_val,Y_val)]=C
    print('Accuracy of classifier on test set with C = %f: %f'%(C,svc.score(X_v

print('best C : {}' .format(score[max(score)]))
#       .format(svc.score(X_val, Y_val)))
# cv = [(slice(None), slice(None))]
# clf = GridSearchCV(svc,param_grid = {'estimator__C':[0.01]},cv=cv)
# clf.fit(X_train,Y_train)
```

```
Accuracy of classifier on test set with C = 0.010000: 0.923529
Accuracy of classifier on test set with C = 0.100000: 0.923529
Accuracy of classifier on test set with C = 0.316228: 0.926471
Accuracy of classifier on test set with C = 1.000000: 0.923529
Accuracy of classifier on test set with C = 3.162278: 0.920588
Accuracy of classifier on test set with C = 10.000000: 0.920588
Accuracy of classifier on test set with C = 10.000000: 0.920588
best C : 0.31622776601683794
```

3) Final test accuracy

```
print('Accuracy of classifier on training set: {:.2f}'
     .format(svc.score(X_train_val, Y_train_val)))
print('Accuracy of classifier on test set: {}'
     .format(svc.score(X_test, Y_test)))

#OR
from sklearn.metrics import accuracy_score
Y_pred = svc.predict(X_test)
print('Accuracy of classifier on test set:',accuracy_score(Y_test,Y_pred ))
print(Y_test)
print(Y_pred)
```

```
Accuracy of classifier on training set: 1.00
Accuracy of classifier on test set: 0.9264705882352942
Accuracy of classifier on test set: 0.9264705882352942
```

4) Fail case images (unsorted and all)

image_0286.jpg Ground Truth: 3 predicted: 1

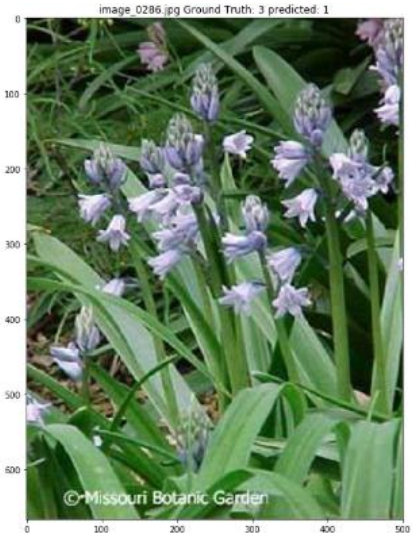


image_0441.jpg Ground Truth: 5 predicted: 2

image_0601.jpg Ground Truth: 7 predicted: 11

image_0398.jpg Ground Truth: 4 predicted: 3

image_0958.jpg Ground Truth: 11 predicted: 13

image_1081.jpg Ground Truth: 13 predicted: 3

image_1042.jpg Ground Truth: 13 predicted: 14

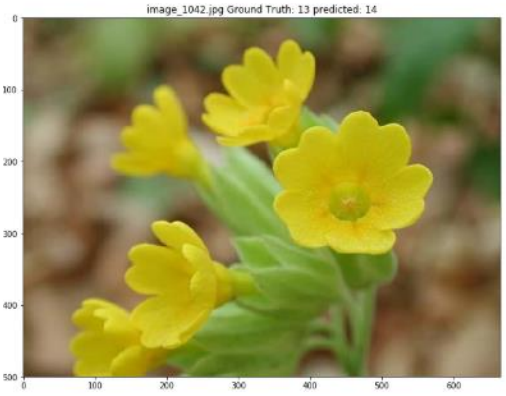


image_1112.jpg Ground Truth: 13 predicted: 7

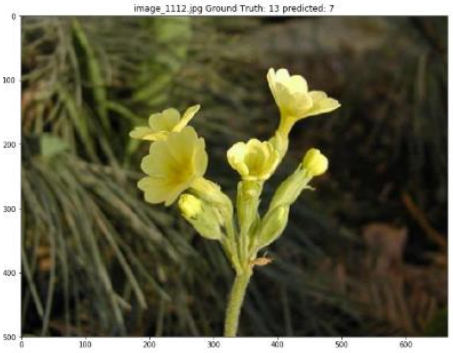



image_0922.jpg Ground Truth: 11 predicted: 4

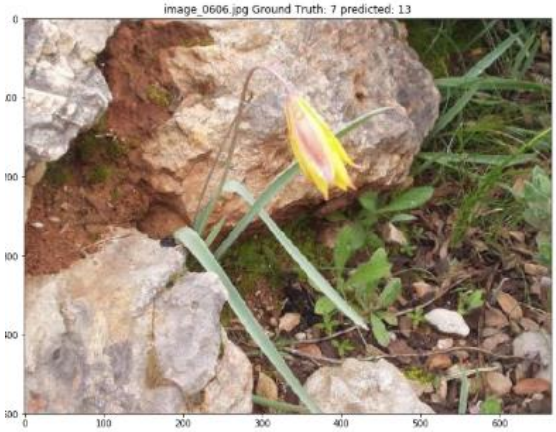


image_0606.jpg Ground Truth: 7 predicted: 13


image_0442.jpg Ground Truth: 5 predicted: 3


image_0062.jpg Ground Truth: 0 predicted: 7


image_1102.jpg Ground Truth: 13 predicted: 7


image_0142.jpg Ground Truth: 1 predicted: 4


image_1266.jpg Ground Truth: 15 predicted: 2


image_1086.jpg Ground Truth: 13 predicted: 0


image_1272.jpg Ground Truth: 15 predicted: 10


image_0706.jpg Ground Truth: 8 predicted: 1


image_0911.jpg Ground Truth: 11 predicted: 12

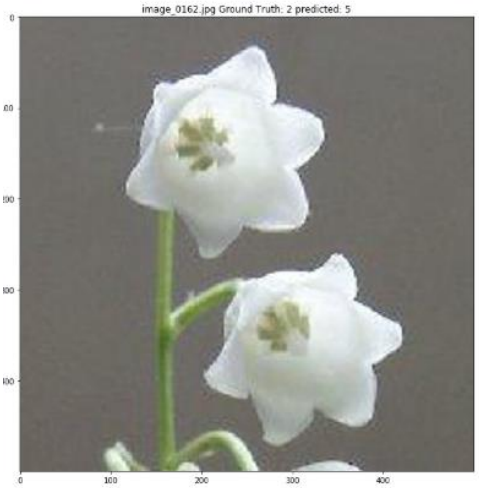


image_0162.jpg Ground Truth: 2 predicted: 5


image_0213.jpg Ground Truth: 2 predicted: 3


image_1358.jpg Ground Truth: 16 predicted: 4


image_0626.jpg Ground Truth: 7 predicted: 13

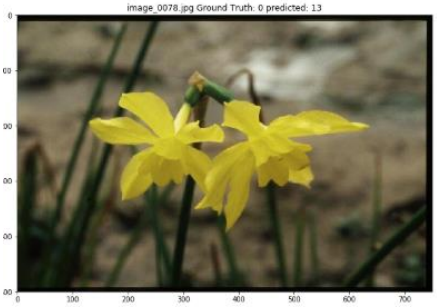
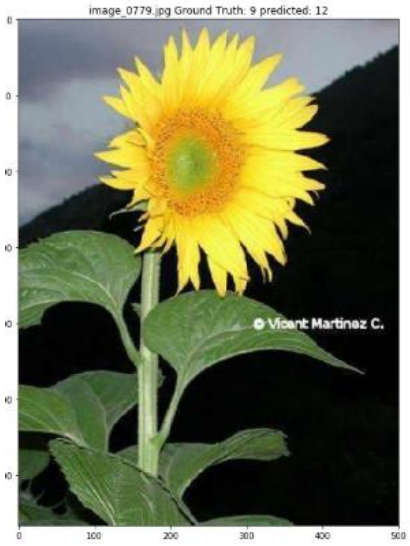


image_0078.jpg Ground Truth: 0 predicted: 13



5) Fail Case Images (Sorted and limit to 2 per class)

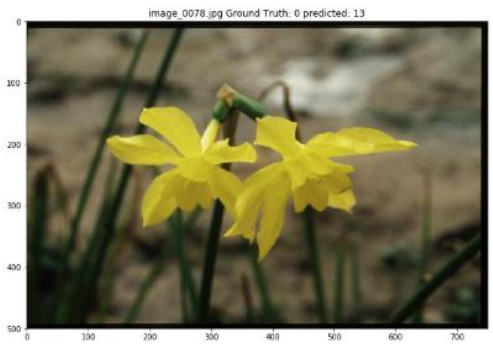


image_0078.jpg Ground Truth: 0 predicted: 13

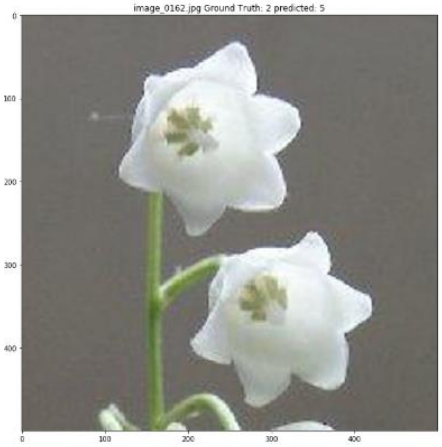


image_0162.jpg Ground Truth: 2 predicted: 5


image_0142.jpg Ground Truth: 1 predicted: 4


image_0213.jpg Ground Truth: 2 predicted: 3


image_0286.jpg Ground Truth: 3 predicted: 1
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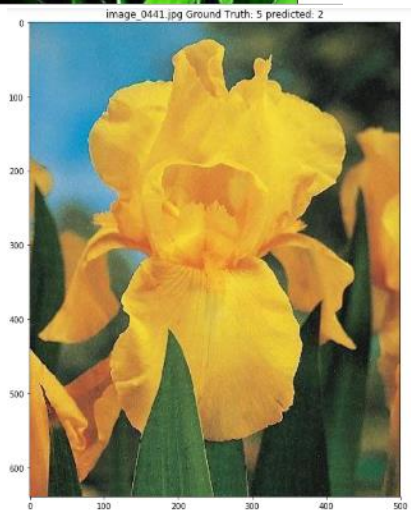
image_0441.jpg Ground Truth: 5 predicted: 2


image_0398.jpg Ground Truth: 4 predicted: 3


image_0442.jpg Ground Truth: 5 predicted: 3

image_0601.jpg Ground Truth: 7 predicted: 11

image_0706.jpg Ground Truth: 8 predicted: 1

image_0779.jpg Ground Truth: 9 predicted: 12

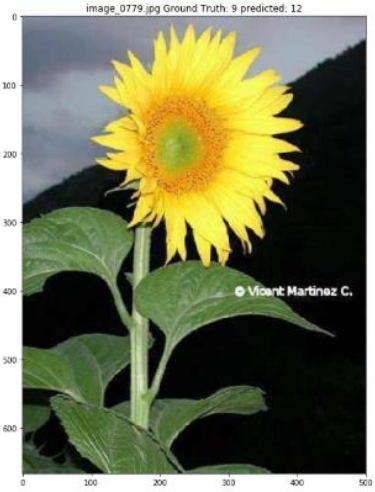

image_0606.jpg Ground Truth: 7 predicted: 13

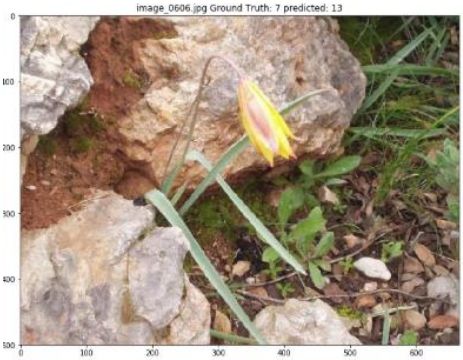

image_1112.jpg Ground Truth: 13 predicted: 7

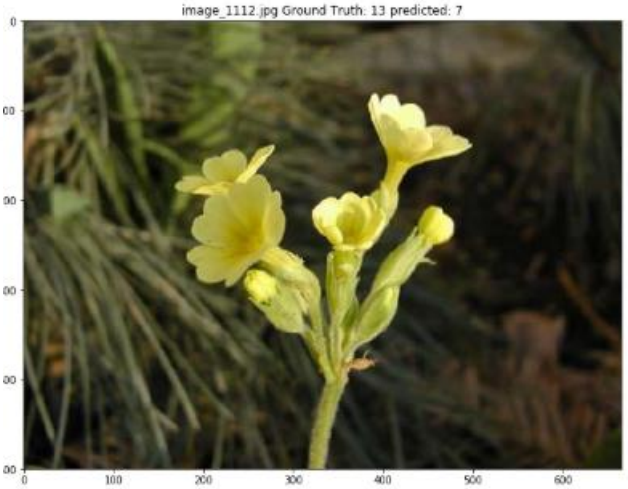

image_0958.jpg Ground Truth: 11 predicted: 13

image_1081.jpg Ground Truth: 13 predicted: 3

image_0922.jpg Ground Truth: 11 predicted: 4


image_1266.jpg Ground Truth: 15 predicted: 2


image_1272.jpg Ground Truth: 15 predicted: 10


image_1358.jpg Ground Truth: 16 predicted: 4