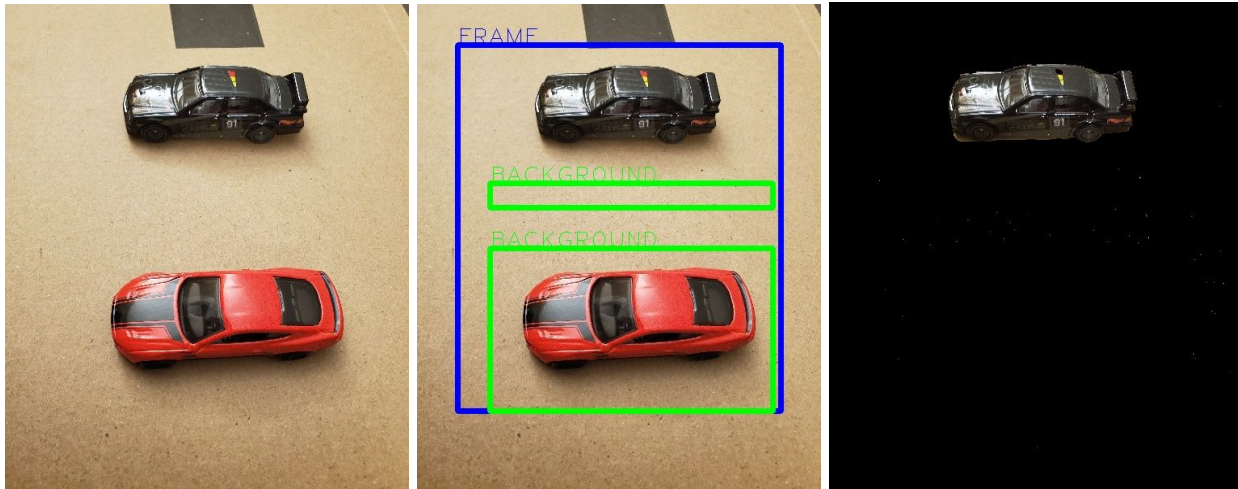
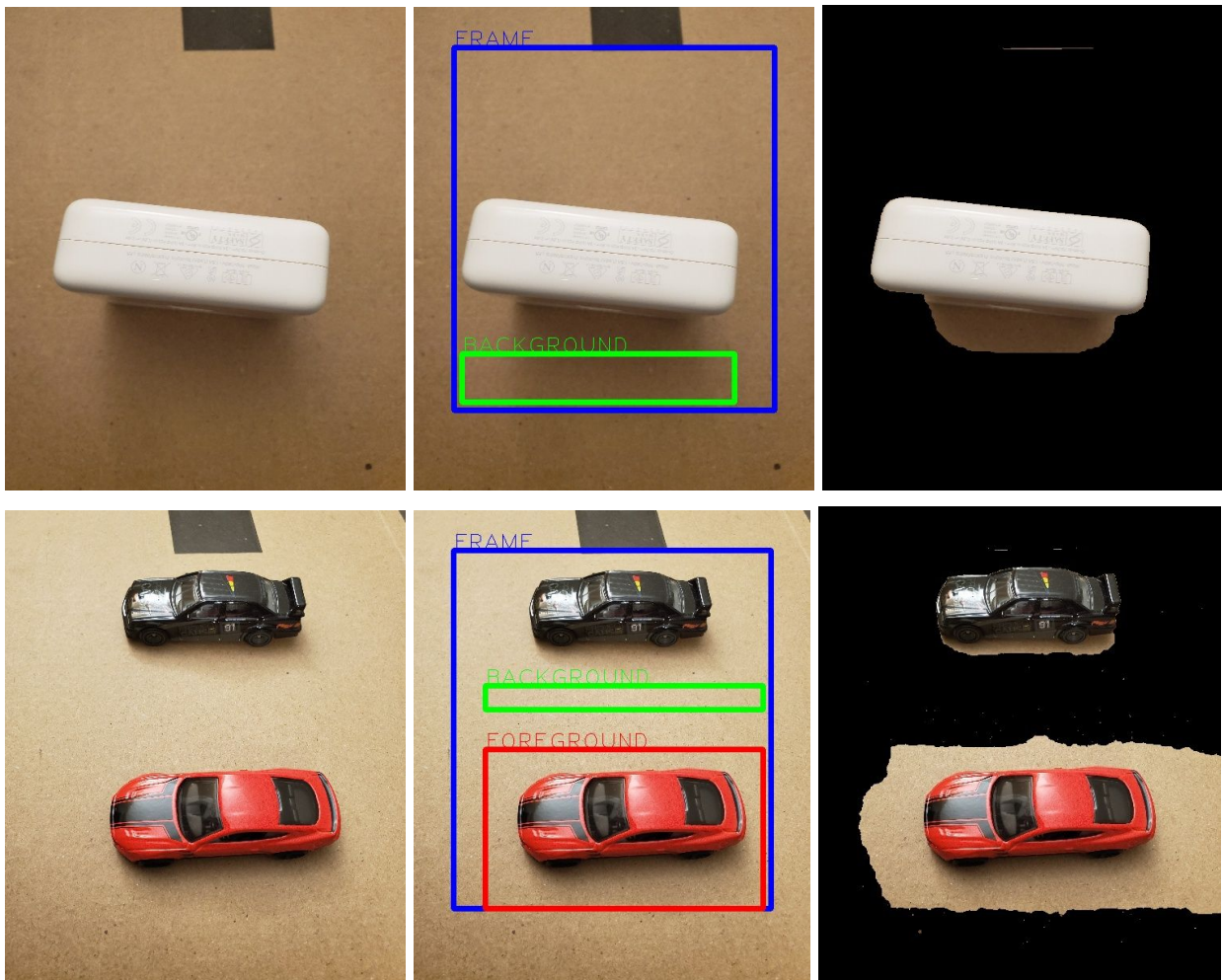


GrabCut:

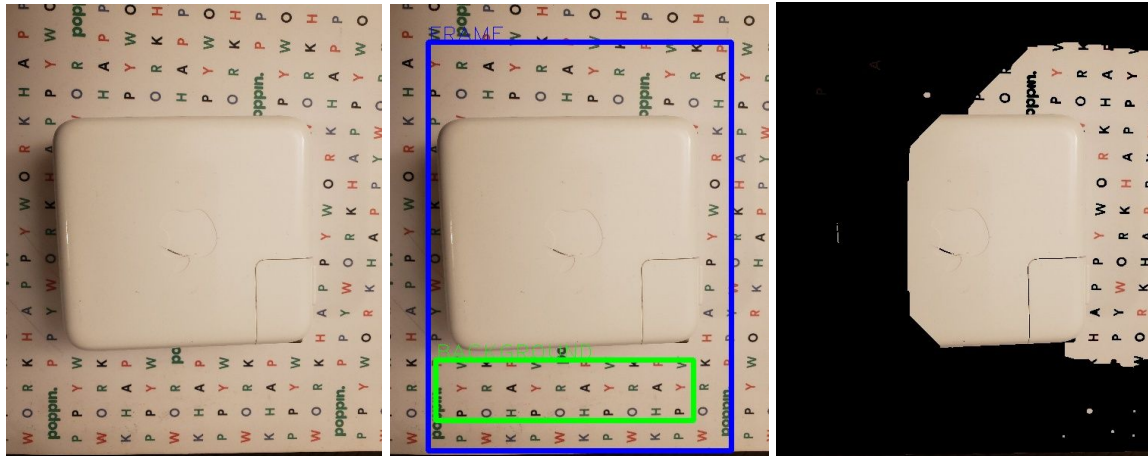
Cases that works great:



Cases that works ok-ish:



Cases that works bad:

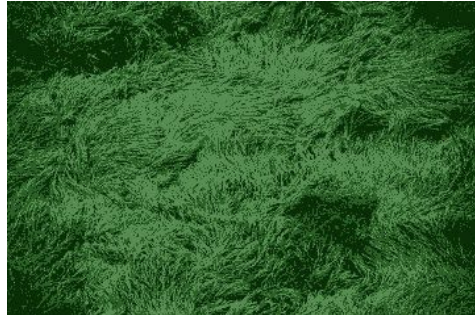


Explanation:

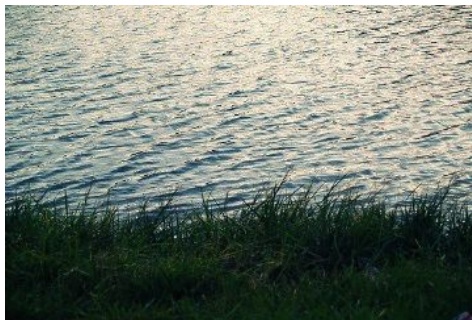
GrabCut works good on cases that have distinguishable difference in terms of colors between foreground and background. If foreground and background have similar colors, this method works pretty bad.

Kmeans

Case of good segmentation:



K = 3

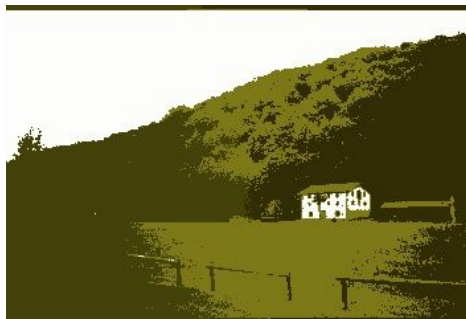


K = 3



K = 5

Case of bad segmentation:



K = 4



Explanation:

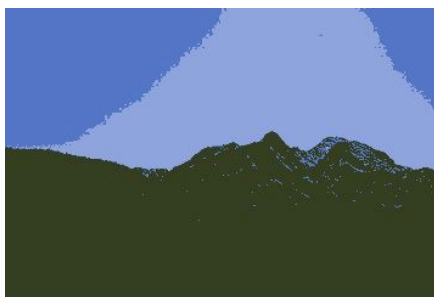
For the bad ones, due to my selection of features (x,y coordinate and RGB of the pixels), if grass is near something with similar colors, the result will be bad, the Kmean will cluster these pixels into one cluster.

For the good ones, the grass are either far away from somewhere else with similar color, or grass has very different color with nearby regions.

Examples for varying k:



K = 1



K = 3



K = 5



K = 7



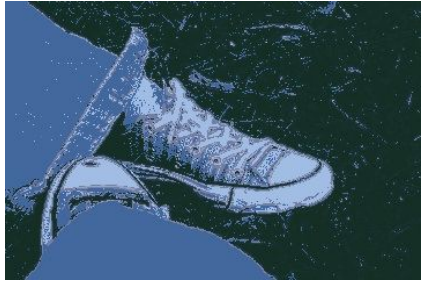
K = 20

For increase in K, the final clustered image will have more detailed color and more color chunks, instead of big chunk of color clusters.

When including sobel magnitude into features:



Without sobel feature K = 8



With sobel feature $K = 8$



With HSV feature $K = 8$

Adding more relevant features will improve segmentation quality.