Hw 1

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GrabCut

Results for basic configuration (2 components, gamma = 10, lamda = 45)

Image name	Accuracy	Jaccard	Time to converge
Banana1	0.96	0.87	1.7
Banana2	0.98	0.92	1.5
Book	0.97	0.93	09
Bush	0.95	0.74	0.85
Cross	0.87	0.65	1.2
Flower	0.99	0.96	1.16
fullmoon	0.97	0.725	0.46
Grave	0.96	0.6	0.9
Llama	0.98	0.93	0.6
Memorial	0.976	0.88	1.4
Sheep	0.99	0.92	0.7
Stone2	0.99	0.98	1.05
teddy	0.983	0.94	0.65

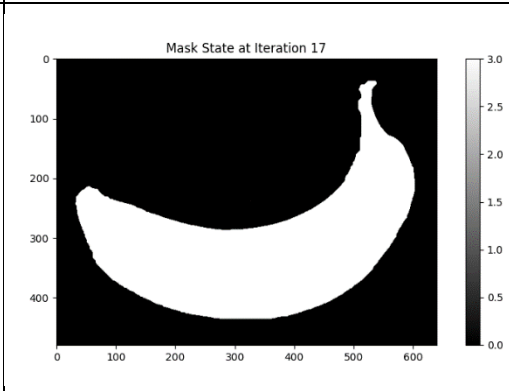
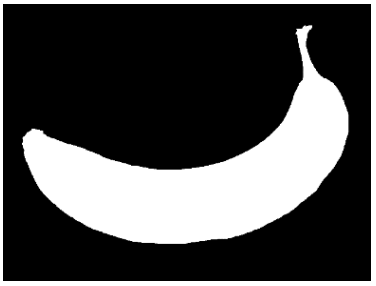
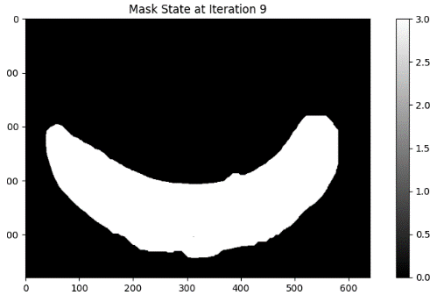
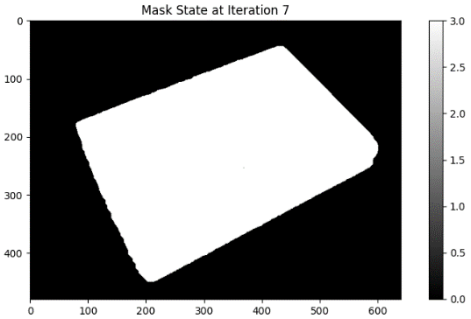
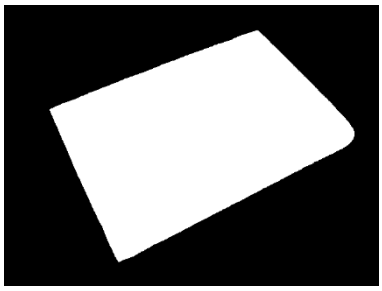
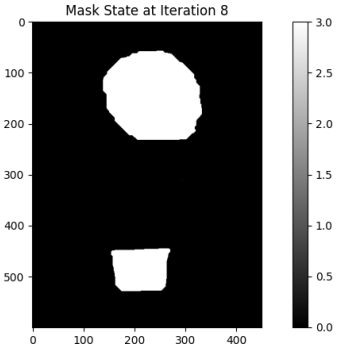
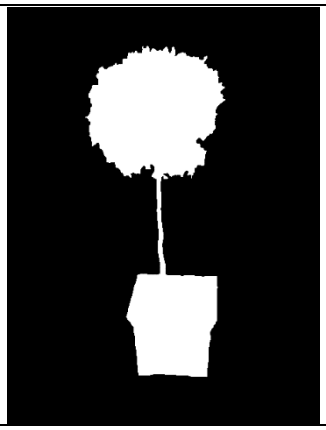
We choose a convergence threshold: stop iterating after 2 iterations that less than 10 pixels became foreground.

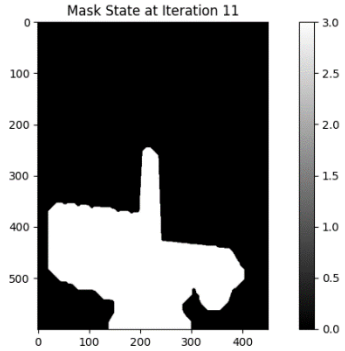
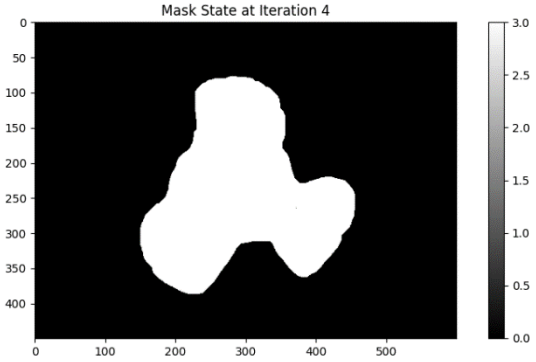
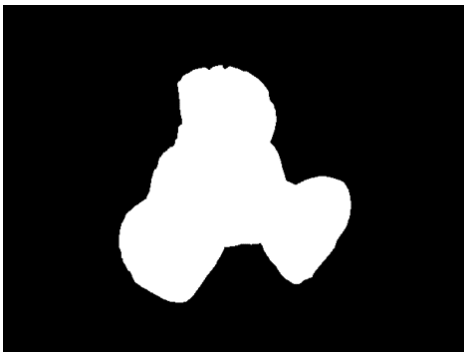
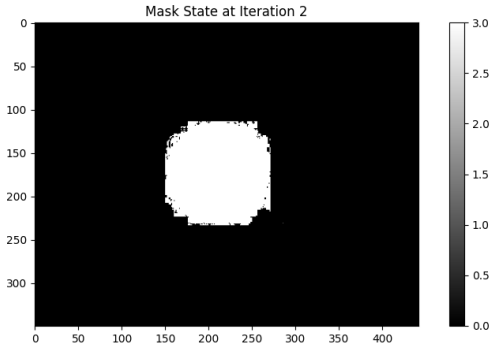
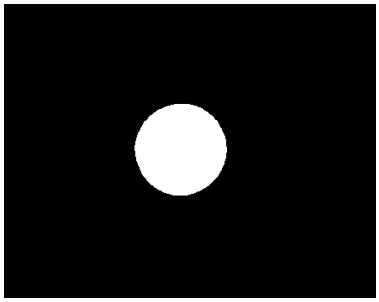
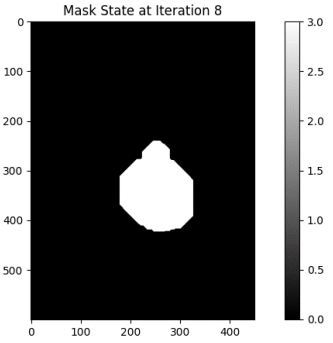
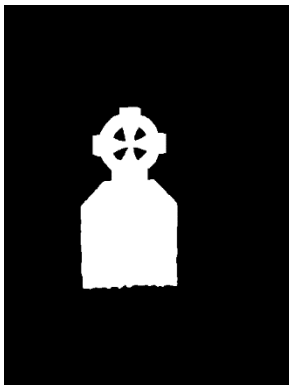
As we can see, the images that were the most difficult to process were Cross and Bush.

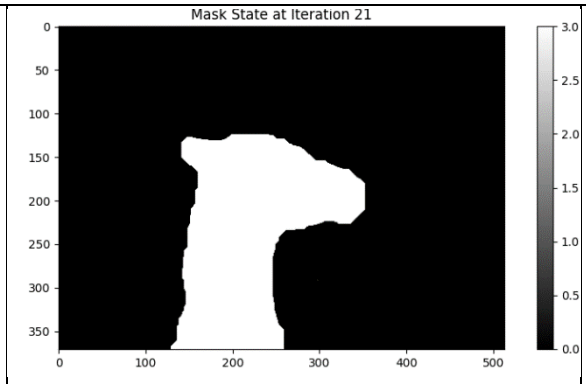
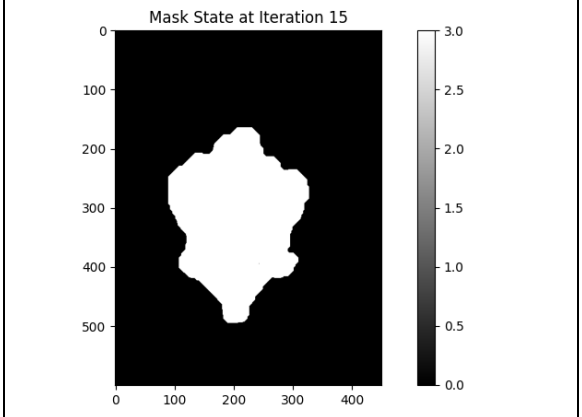
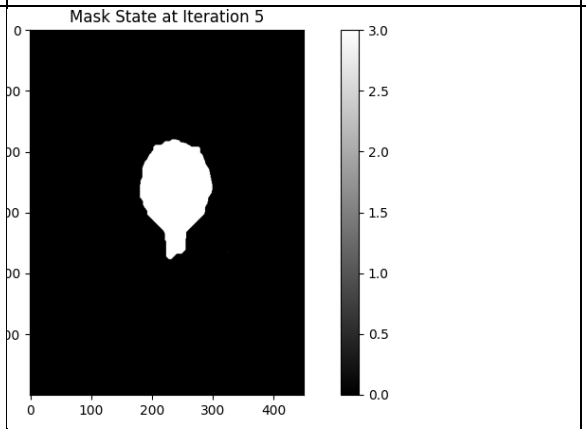
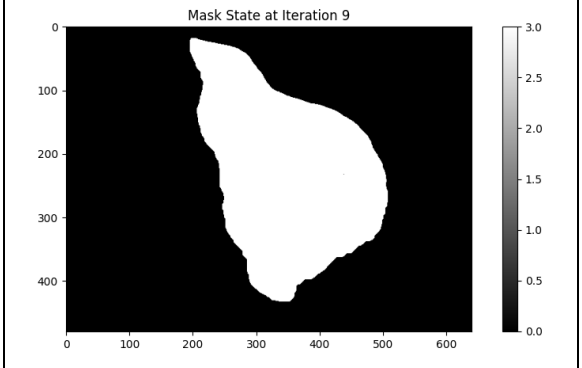
Cross image has a lot of similarity between the base of the cross and the background. Also, its post is thin, so it vanishes after one or two iterations because of the gamma and lambda values (which should be lower in this case and ensure the convergence is slower).

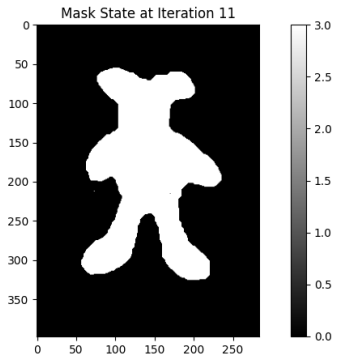
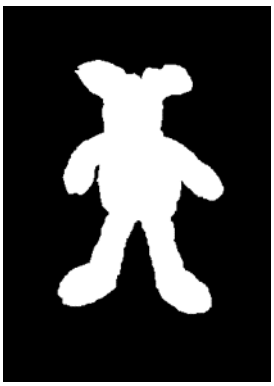
Bush image is doing well overall, but the trunk is too thin, so again, after a few iterations, we only have the bush itself with little of a flowerpot.

We chose 2 components because most of images has noticeable background so 2 colors make sense more then 5 (regards similarity).

Image	Mask	GT Mask
Banana1		
Banana2		
Book		
Bush		

Cross		
Flower		
Fullmoon		
Grave		

Llama		
Memorial		
Sheep		
Stone2		

Teddy		

I'll examine bush, cross and grave images.

Results with original configurations:

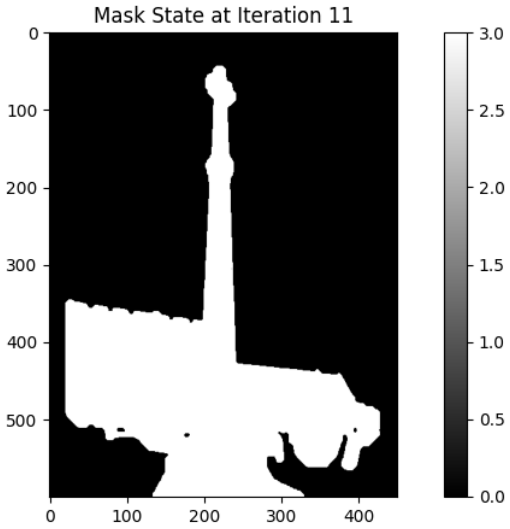
Grave: acc: 0.96 jacc: 0.6 time to converge: 0.9 min

Cross: acc: 0.87 jacc: 0.65 time to converge: 1.2min

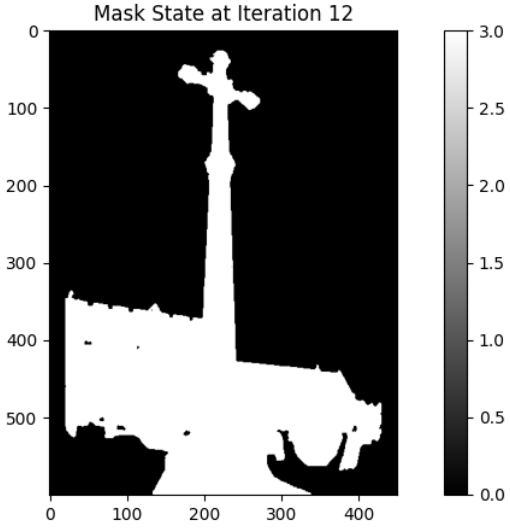
Grave hasn't succeeded to identify the top of the grave. We changed gamma to 2 to be more sensitive and number of components to 5 and got this:

Accuracy of 0.97, Jaccard of 0.787 in 0.85 minutes. Great improvement.

We inspected the Cross, which has almost worst results. It still hard to include the top part of the cross as part of the foreground because gamma is too high. After changing gamma to 2 we got this:



Accuracy is 0.9 and Jaccard is 0.73 and running time of 1.4 minutes. We felt that we can achieve even better results with the Cross, so we changed gamma to 0.5 and we got this:



Acc of 0.91!.

Poisson blending results

Banana1 with table:

The banana is blended well with the table background. The tight mask ensures that the edges of the banana are smooth and integrate seamlessly with the background, creating a realistic composite image.

Flower with Grass Mountains:

The flower integrates naturally with the grass mountains background, with intricate details captured by the tight mask, resulting in a smooth and realistic blend.

2 examples of Non Tight:

Both the bush and the grave exhibit blurred and poorly defined edges against the wall background. The non-tight masks cause inaccurate blends, making the objects appear less natural and less cohesive with the wall. The loose masks result in less defined edges, making the objects look unrealistic and poorly integrated