CS 663: Digital Image Processing
Assignment - 3

Question – 3

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Question – 3) Part A) Image 1 – Bird.jpg

Original

Mask

only foreground

only background

Question – 3) Part A) Image 1 – flower.jpg

Original Mask

only foreground only background

We used grabcut algorithm to create mask. The algorithm works like zthis:

we input the rectangle(bounding box indicating foreground region) . Everything outside this rectangle will be taken as sure background. Everything inside rectangle is unknown.

Computer does an initial labelling depending on the data we gave. It labels the foreground and background pixels. A Gaussian Mixture Model(GMM) is used to model the foreground and background. GMM learns and creates new pixel distribution. That is, the unknown pixels are labelled either probable foreground or probable background depending on its relation with the other hard-labelled pixels in terms of color statistics .

A graph is built from this pixel distribution. Nodes in the graphs are pixels. Additional two nodes are added,source and sink node. Every foreground pixel is connected to Source node and every background pixel is connected to Sink node.

The weights of edges connecting pixels to source node/end node are defined by the probability of a pixel being foreground/background.

Then a mincut algorithm cuts the graph into two separating source node and sink node with minimum cost function. The cost function is the sum

of all weights of the edges that are cut. After the cut, all the pixels connected to Source node become foreground and those connected to Sink node become background.

Question – 3) Part E) Image 1 – Bird.jpg

Original Image

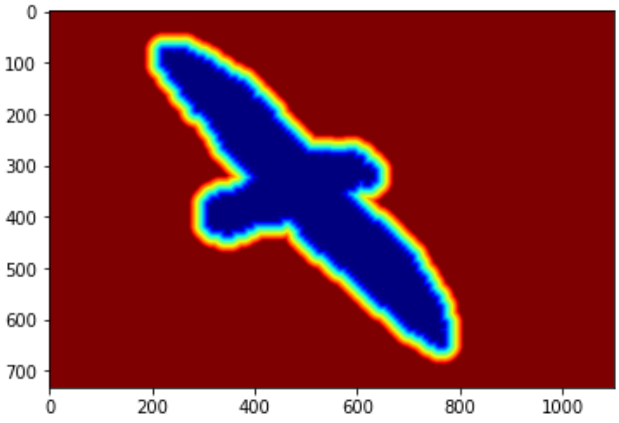
Blurred Image

Question – 3) Part E) Image 2 – Flower.png

Original Image

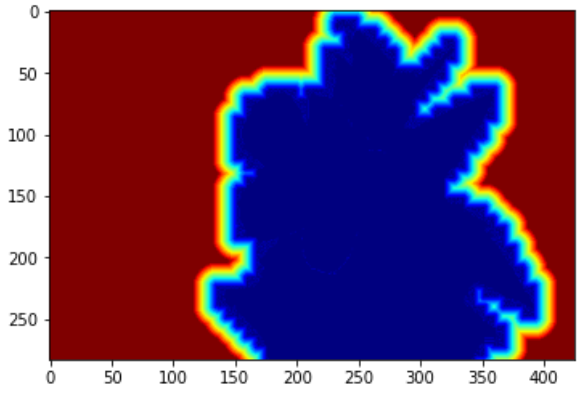
Blurred Image

Question – 3) Part C) Image 1 – Bird.jpg



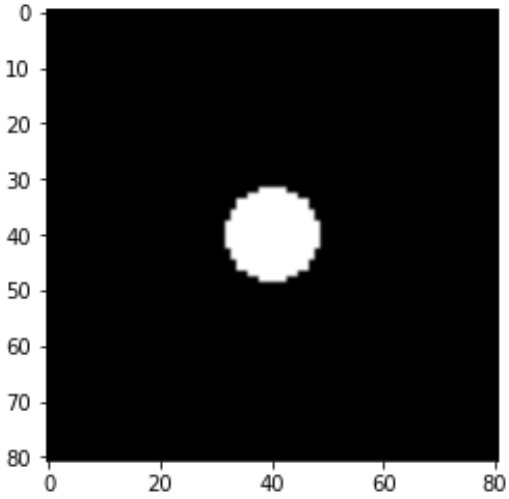
Original Image **Radius-colormap Image**

Question – 3) Part C) Image 2 – Flower.png

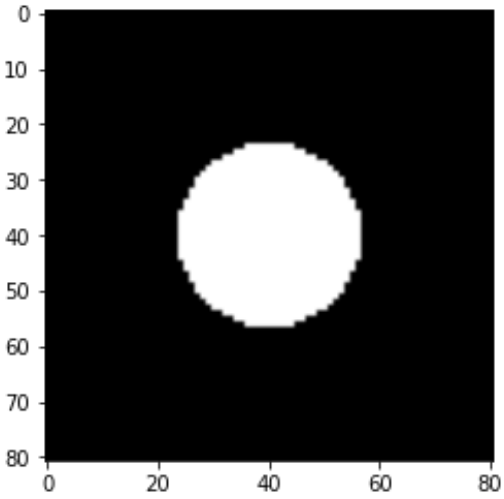


Original Image **Radius-colormap Image**

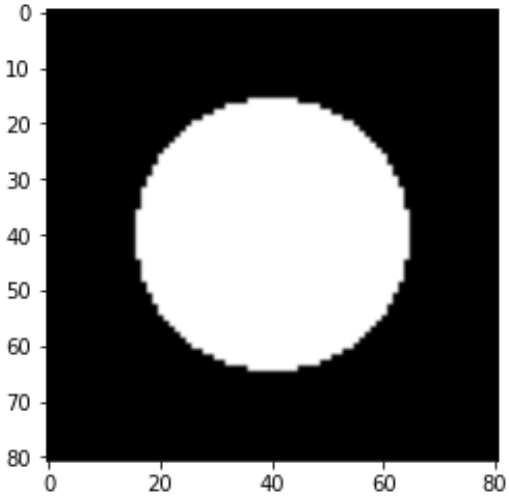
Qn. 3) Part D)



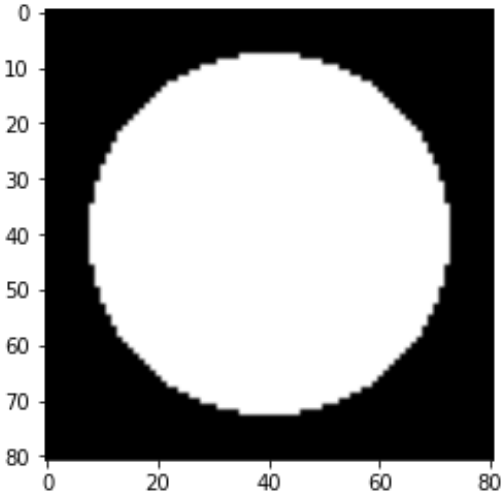
0.2*alpha



0.4*alpha



0.6*alpha



0.8*alpha