

BT6270: Computational Neuroscience
Assignment 3 (Hopfield Network)

Submitted by
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1. Text file to Images:



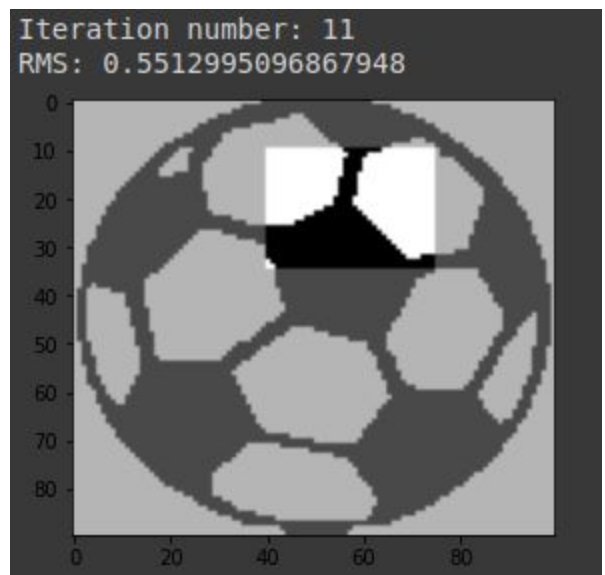
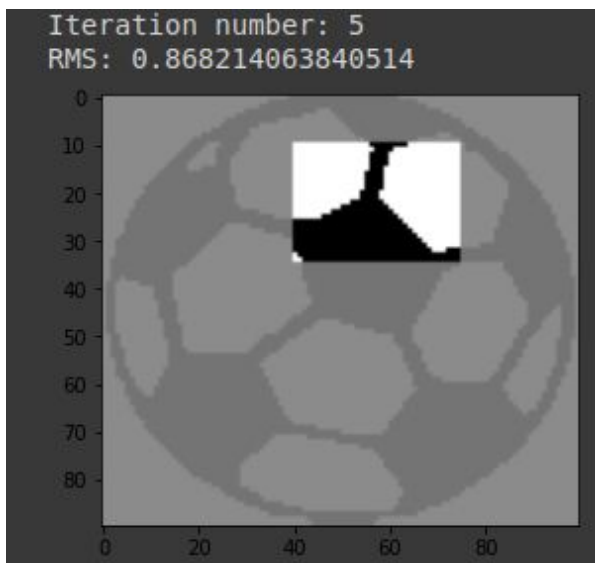
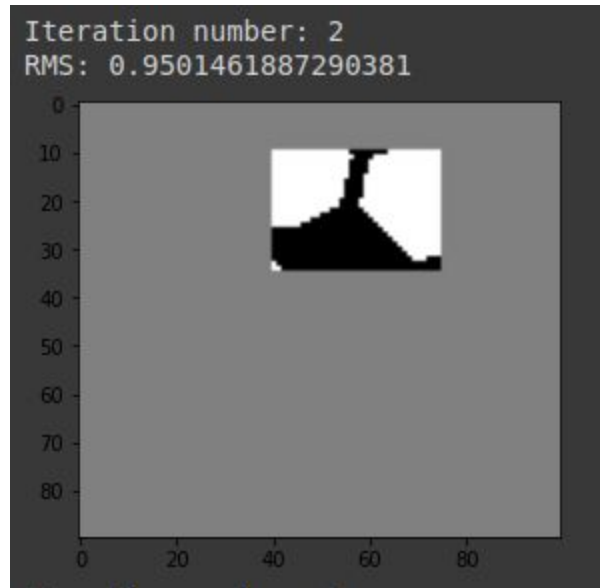
2. Ball Image:

Images recalled after storing only the ball image

Patch selected: Patch from 10:35, 40:75



Iteration number: 0



Iteration number: 18
RMS: 0.12013917129277808



Iteration number: 32
RMS: 0.003482930688670199



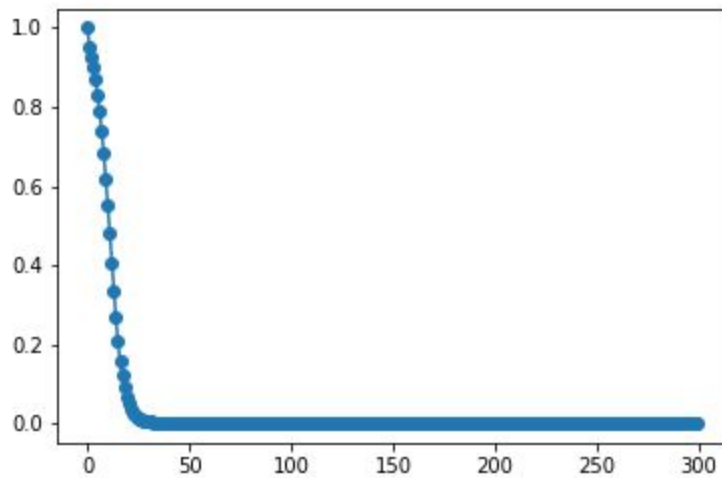
Iteration number: 95
RMS: 0.00010451119295426918



Iteration number: 300
RMS: 9.087863135760355e-05



RMS value vs Time plot:



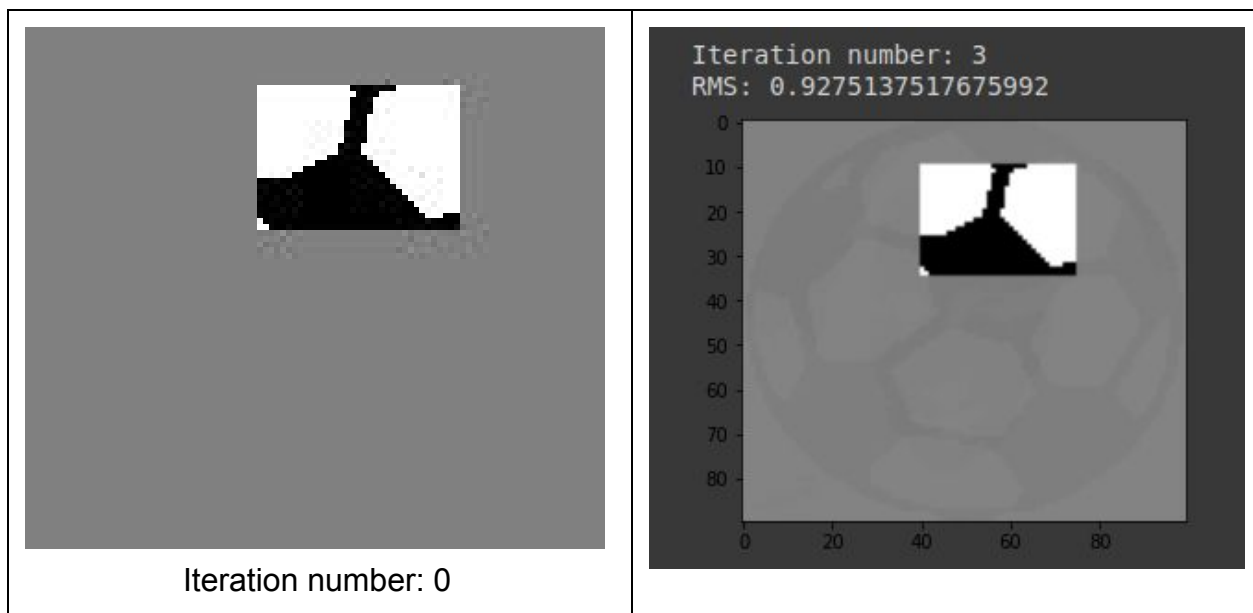
3. All Images Network:

Images recalled after storing all three images

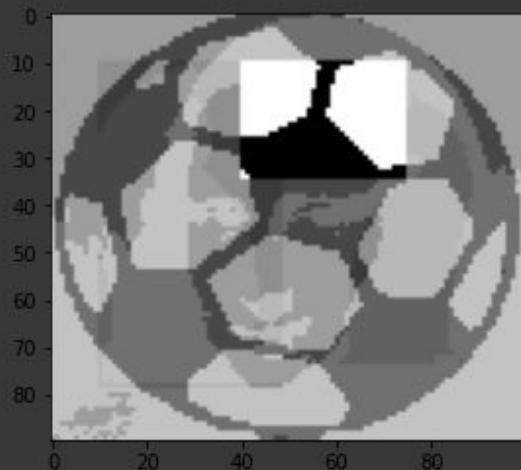
Patch selected for all three images: Patch from 10:35, 40:75

a,b) Before zeroing out

Ball Image:



Iteration number: 10
RMS: 0.6539123782353882



Iteration number: 30
RMS: 0.018963541859631547



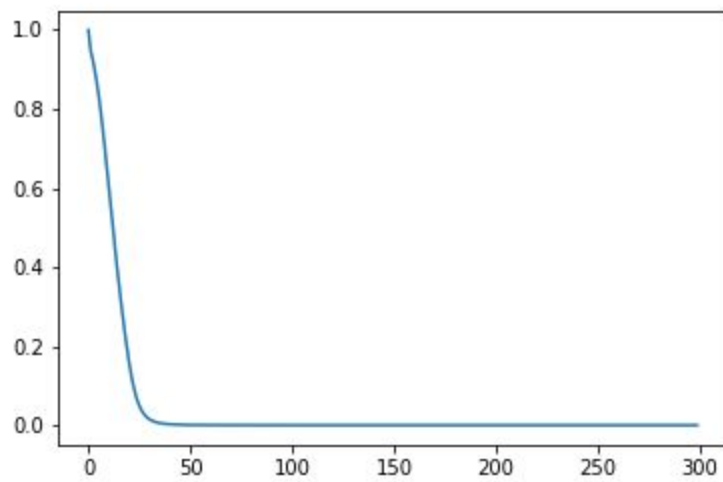
Iteration number: 95
RMS: 0.00020959374187917146



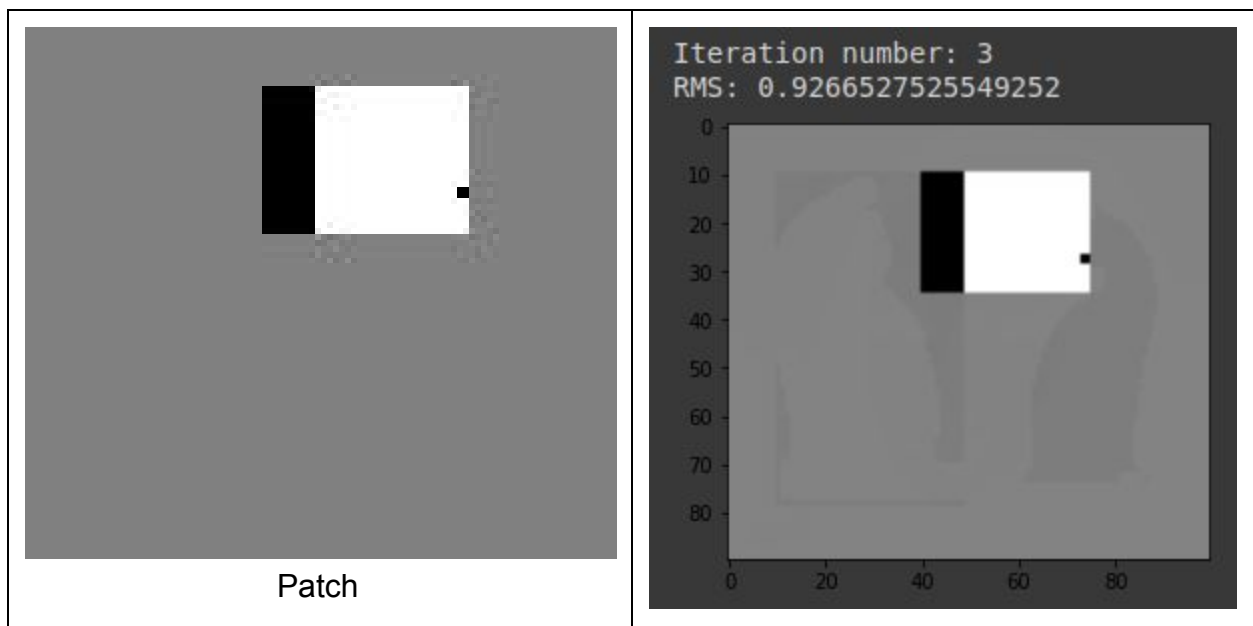
Iteration number: 300
RMS: 0.00017903193564784342



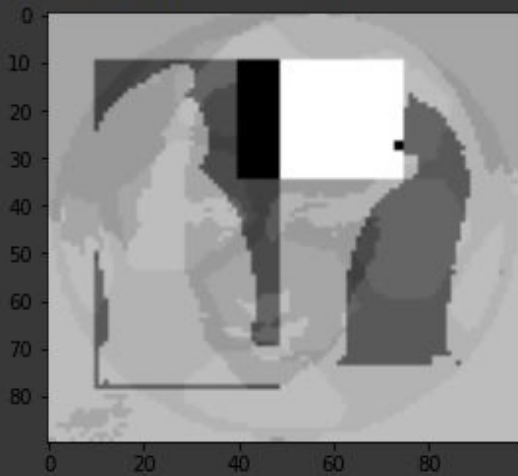
RMS value vs Time plot:



Cat Image:



Iteration number: 10
RMS: 0.6181279602960675



Iteration number: 30
RMS: 0.01250098099521545



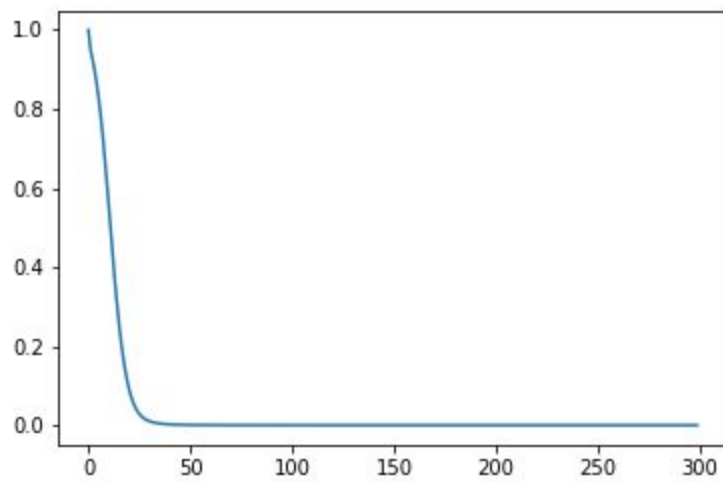
Iteration number: 95
RMS: 0.00028210511080993723



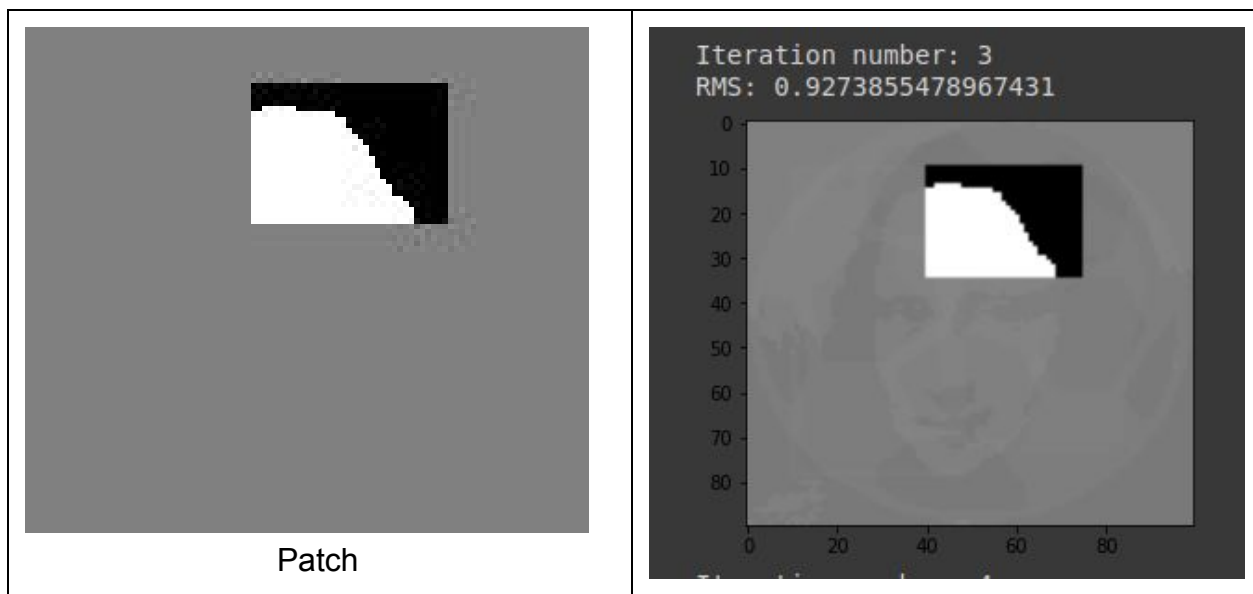
Iteration number: 300
RMS: 0.00024600331270538487



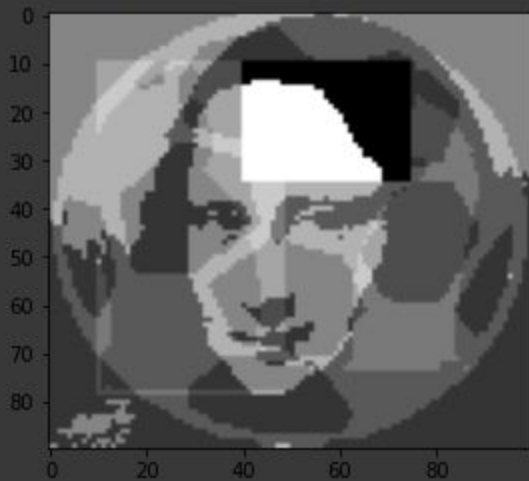
RMS value vs Time plot:



Monalisa Image:



Iteration number: 10
RMS: 0.6699901708108611



Iteration number: 30
RMS: 0.04421164935076796



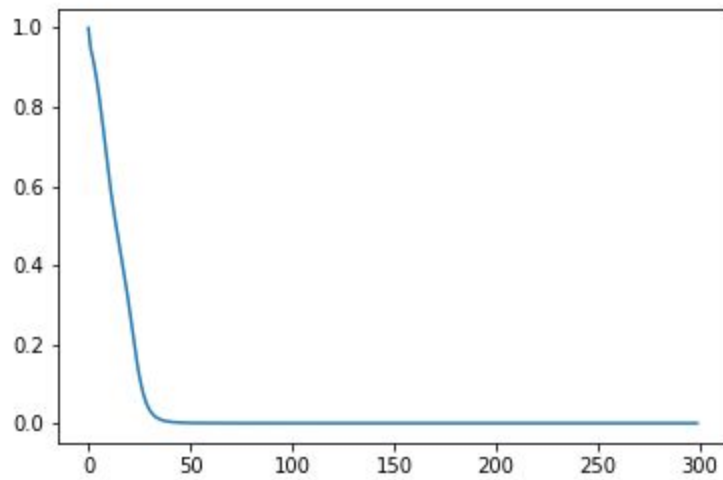
Iteration number: 96
RMS: 0.00015877621148311



Iteration number: 300
RMS: 0.00013164135156734899



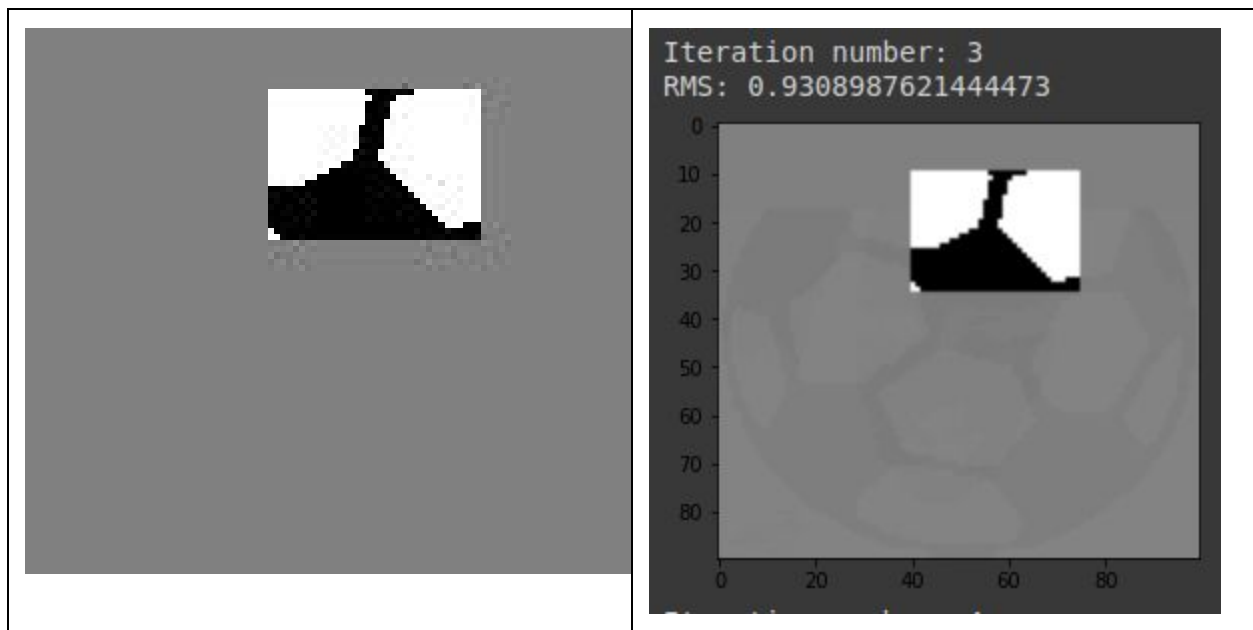
RMS value vs Time plot:



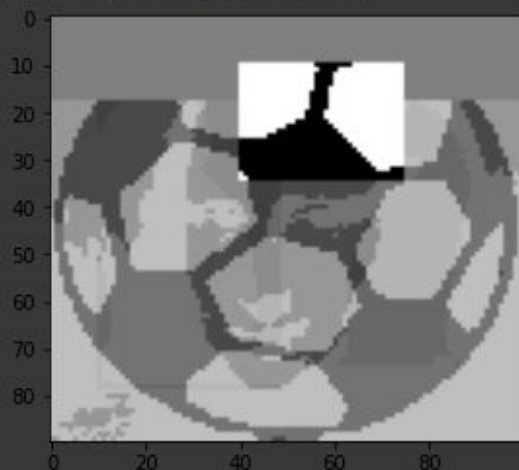
c) Zeroing out

Images recalled after zeroing out 20% of weights matrix

Ball Image:



Iteration number: 10
RMS: 0.7350738234811445



Iteration number: 30
RMS: 0.4258375179119046



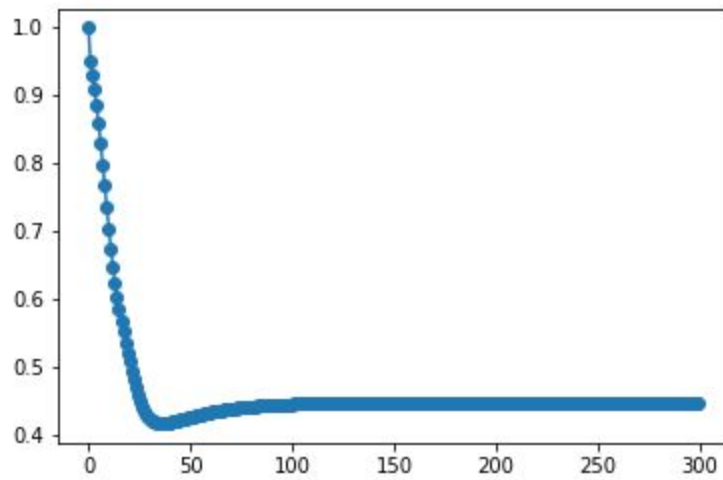
Iteration number: 95
RMS: 0.4444636476802057



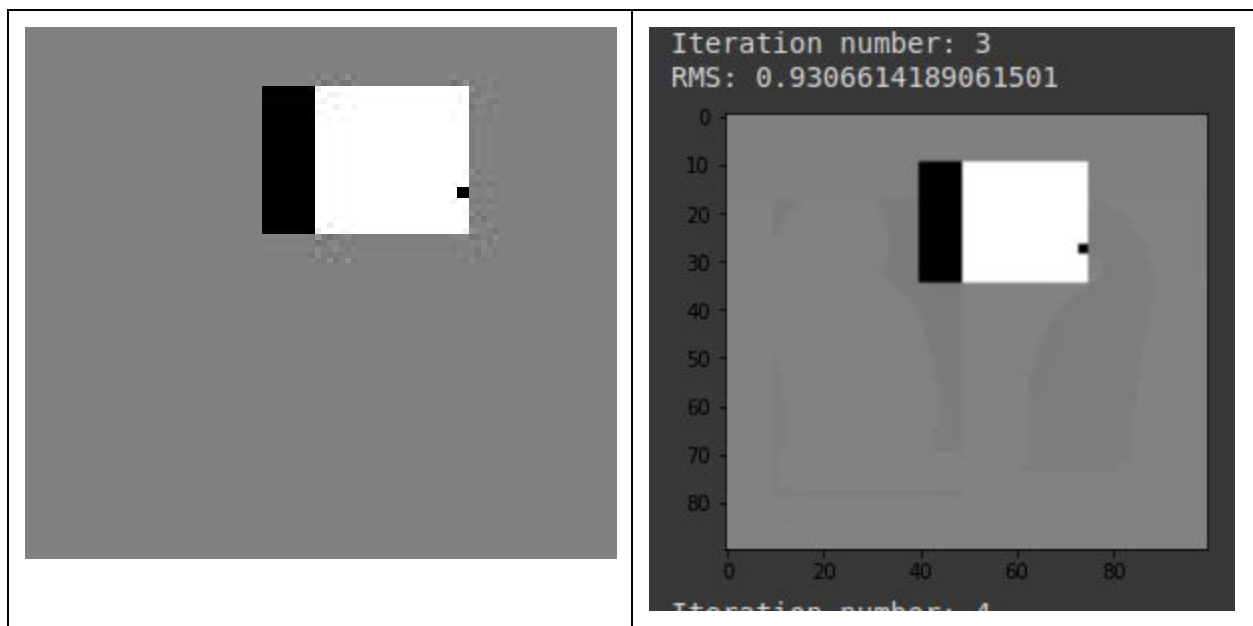
Iteration number: 300
RMS: 0.44721502487846143



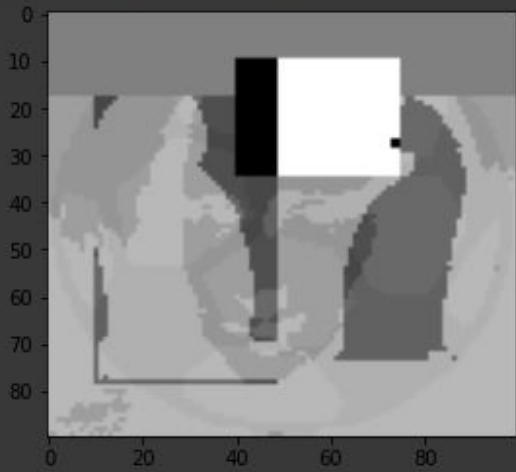
RMS value vs Time plot:



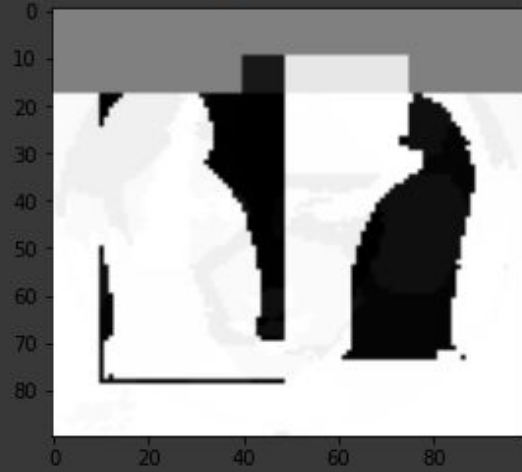
Cat Image:



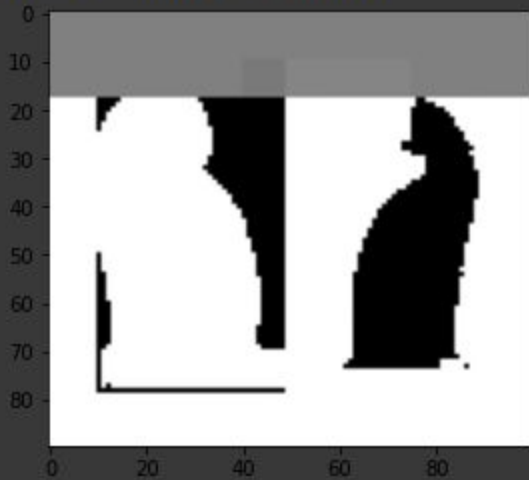
Iteration number: 10
RMS: 0.7168563555468109



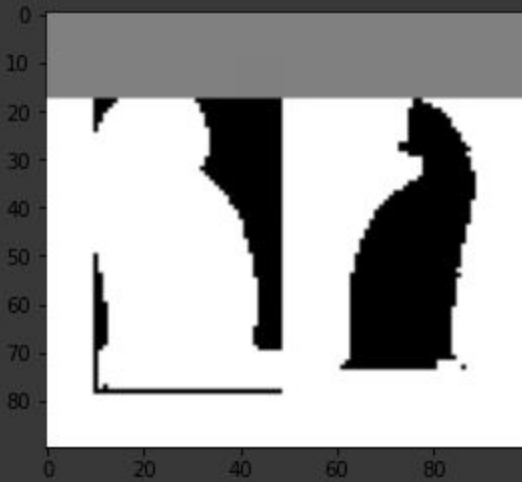
Iteration number: 30
RMS: 0.41548702349929684



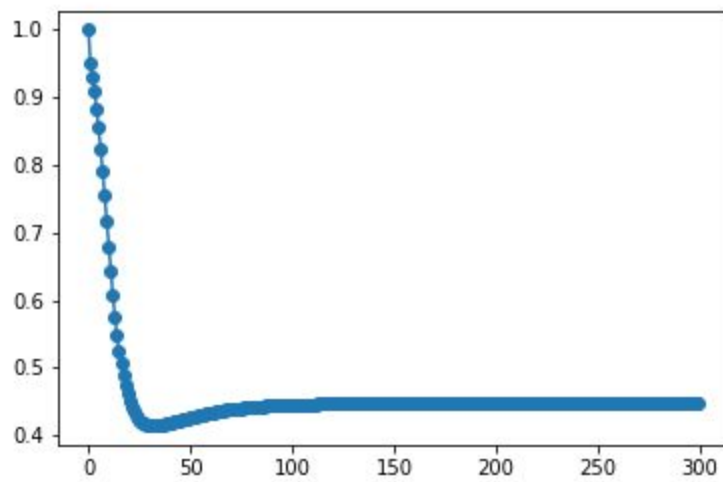
Iteration number: 95
RMS: 0.44446493175854906



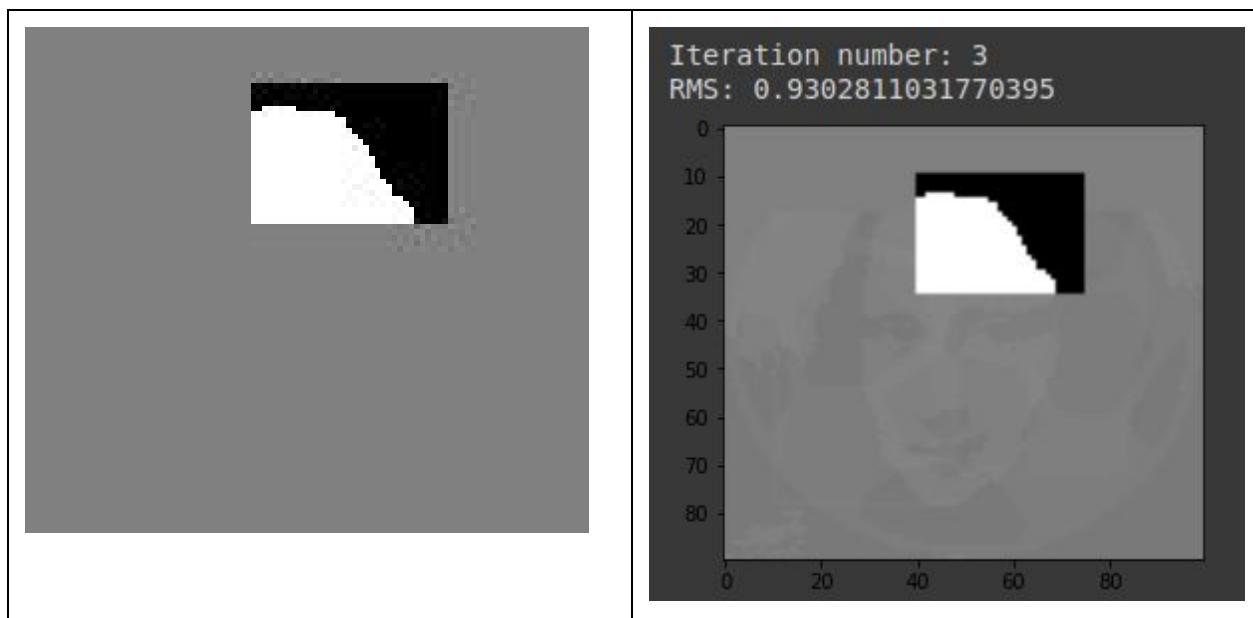
Iteration number: 300
RMS: 0.4472161591157982



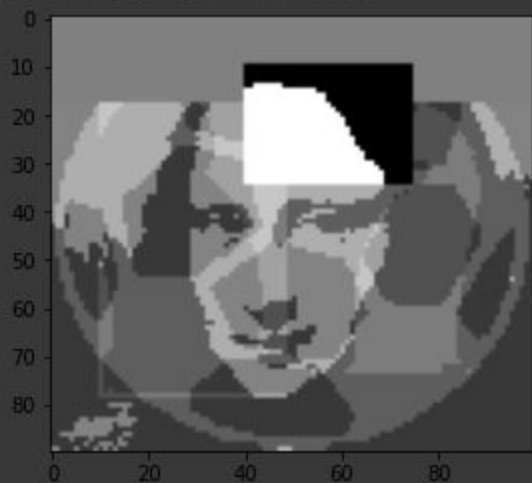
RMS value vs Time plot:



Monalisa Image:



Iteration number: 10
RMS: 0.7297493055046105



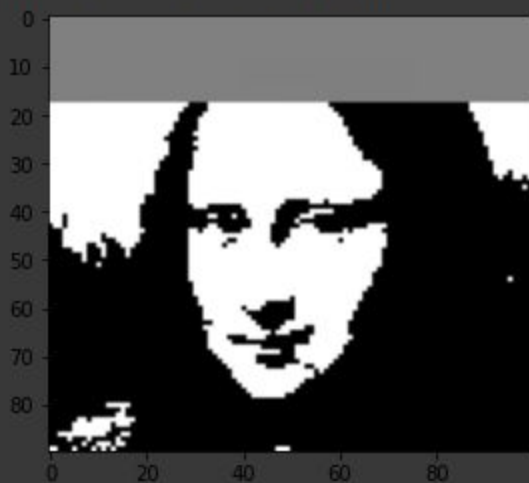
Iteration number: 30
RMS: 0.45836164408807306



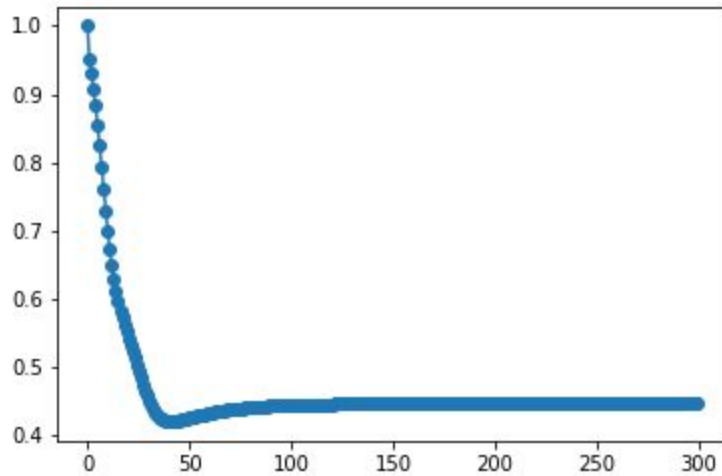
Iteration number: 95
RMS: 0.4444679765036879



Iteration number: 300
RMS: 0.4472174791425968



RMS value vs Time plot:



Attachments

BE17B023A3.zip

- be17b023A3report.pdf
- q2.py - Contains code for 1,2
- q3.py - Contains code for 3 a,b
- q3c.py - Contains code for 3c
- q2.gif - Output images for 2 compiled as gif
- output_ball.gif, output_cat.gif, output_mona.gif - Output images for 3a,b compiled as gifs
- output_ball_zero.gif, output_cat_zero.gif, output_mona_zero.gif - Output images for 3c compiled as gifs