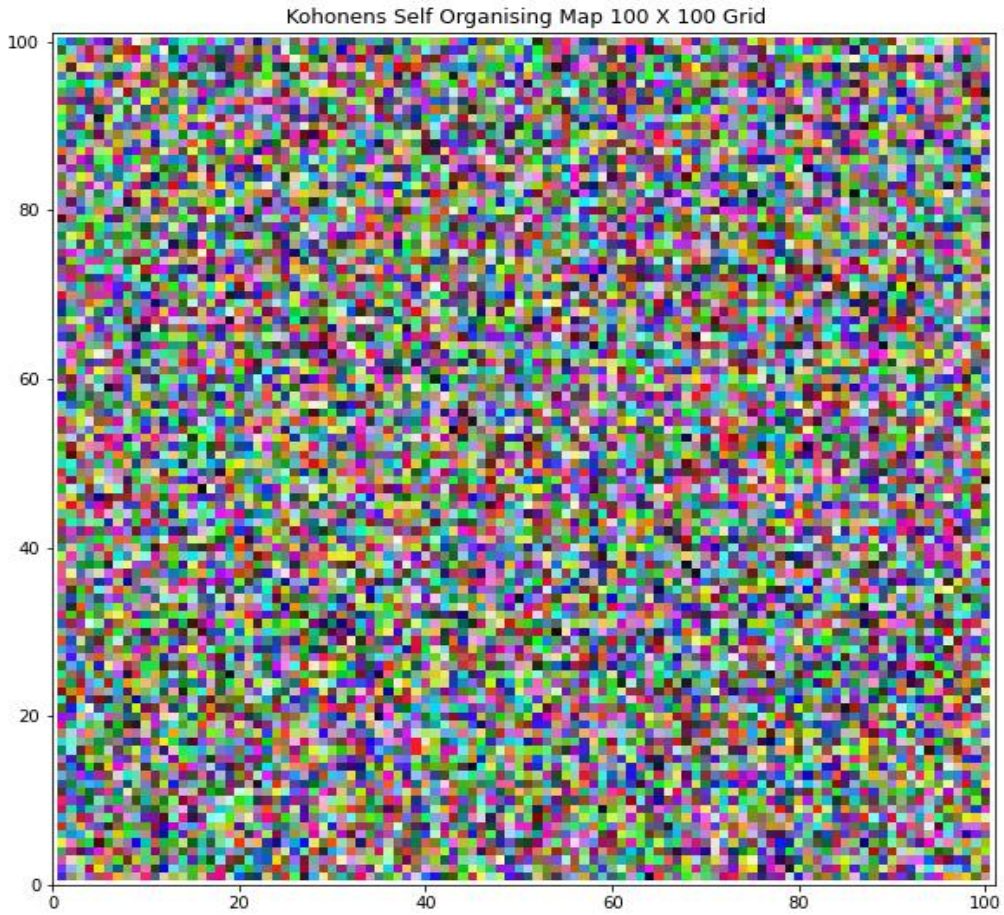
Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090

QUESTION 4

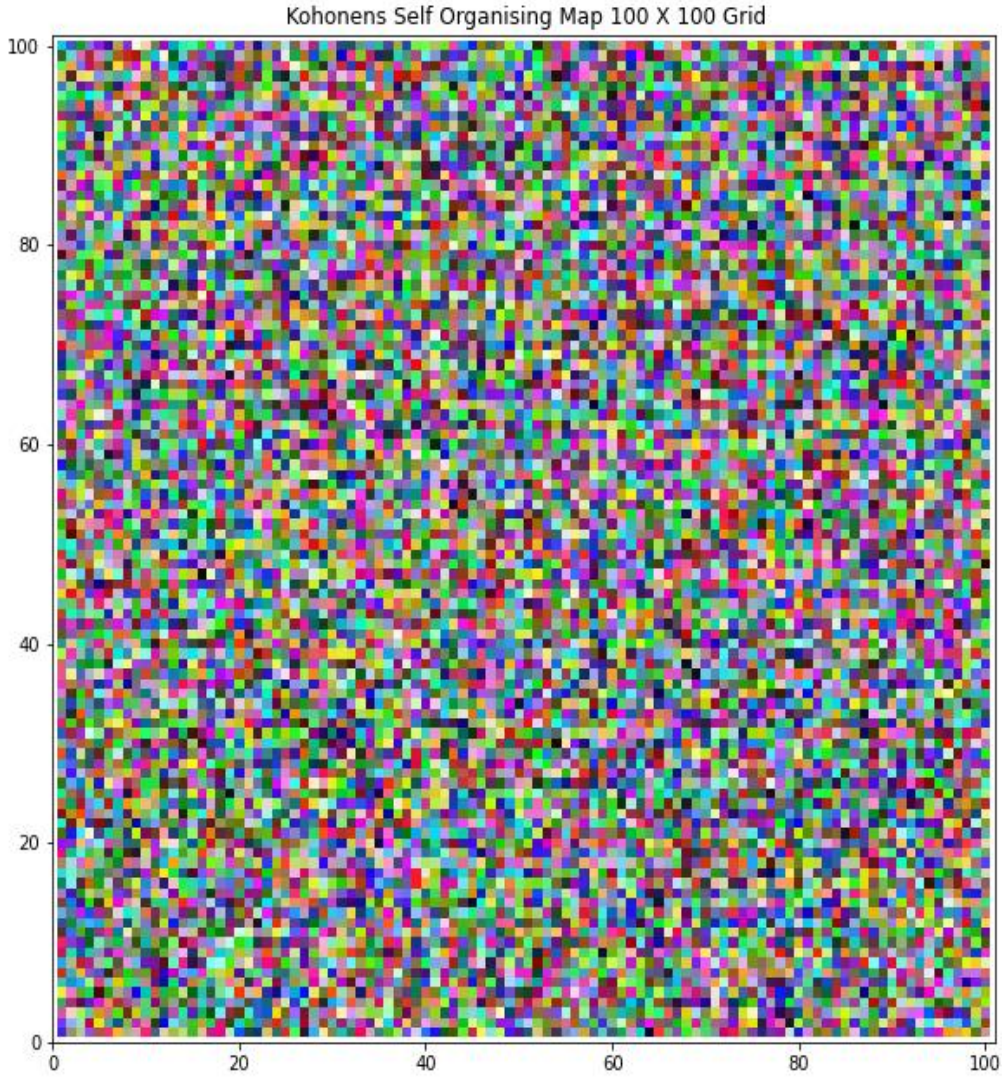
4a

The SOM figures for the original grid and at 20 , 40 , 100 and 1000 epochs when $\sigma_o = 1$ is shown below



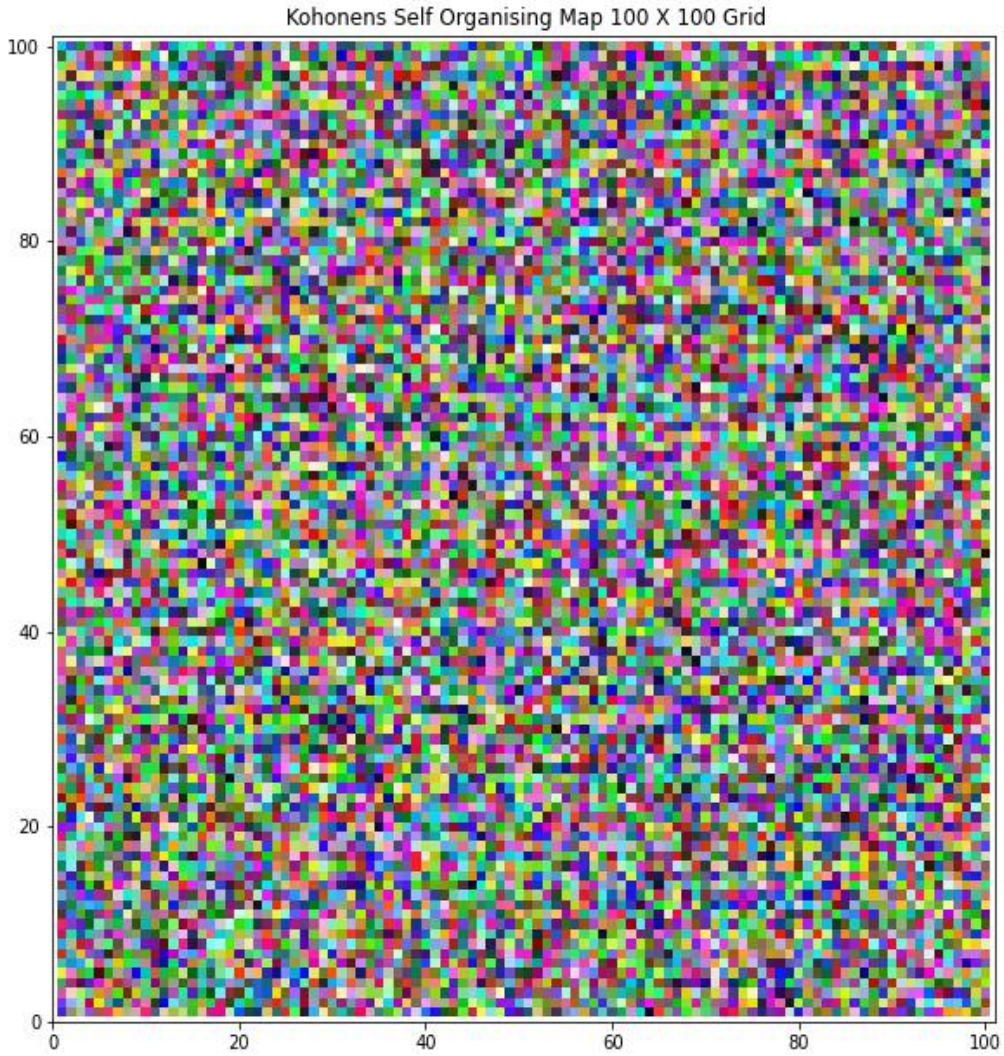
ORIGINAL GRID

Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090



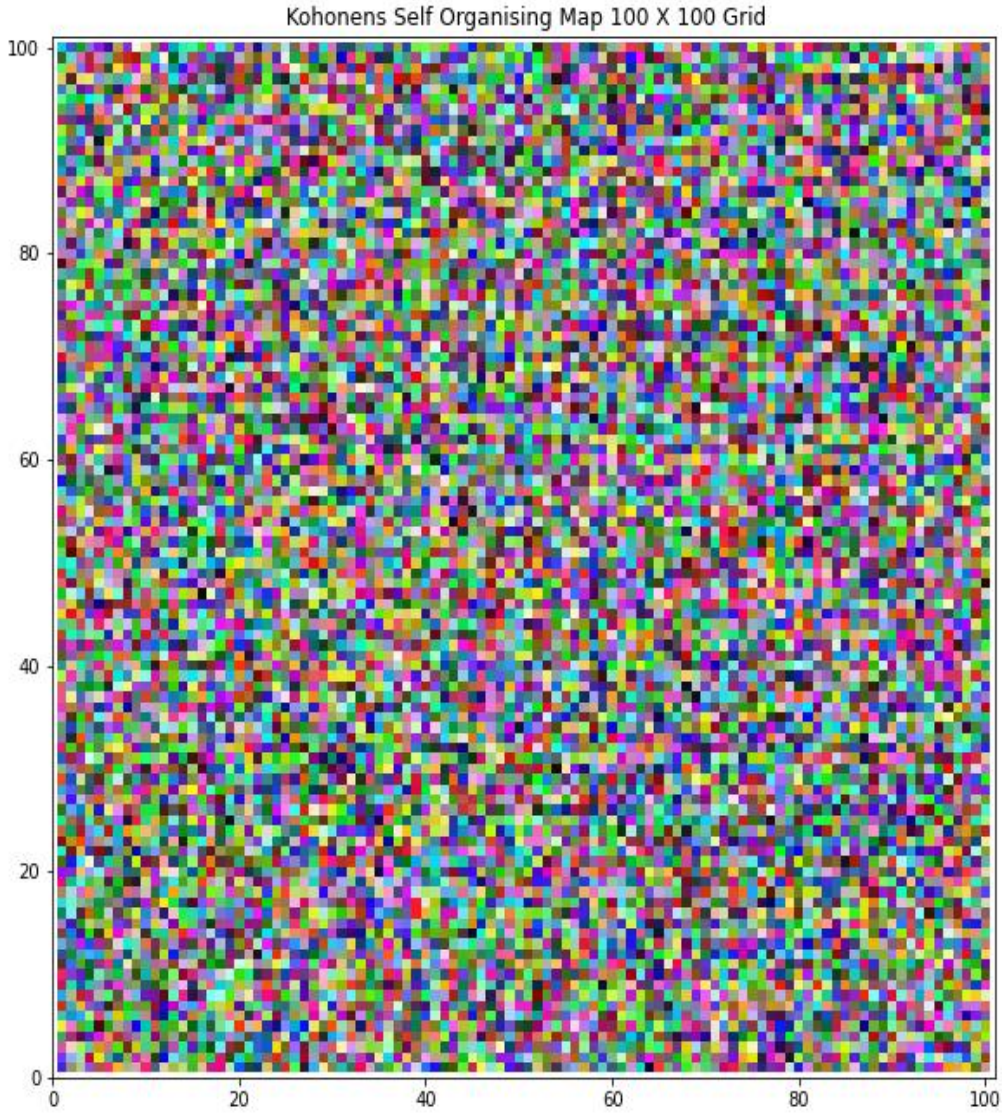
GRID AT 20 EPOCHS

Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090



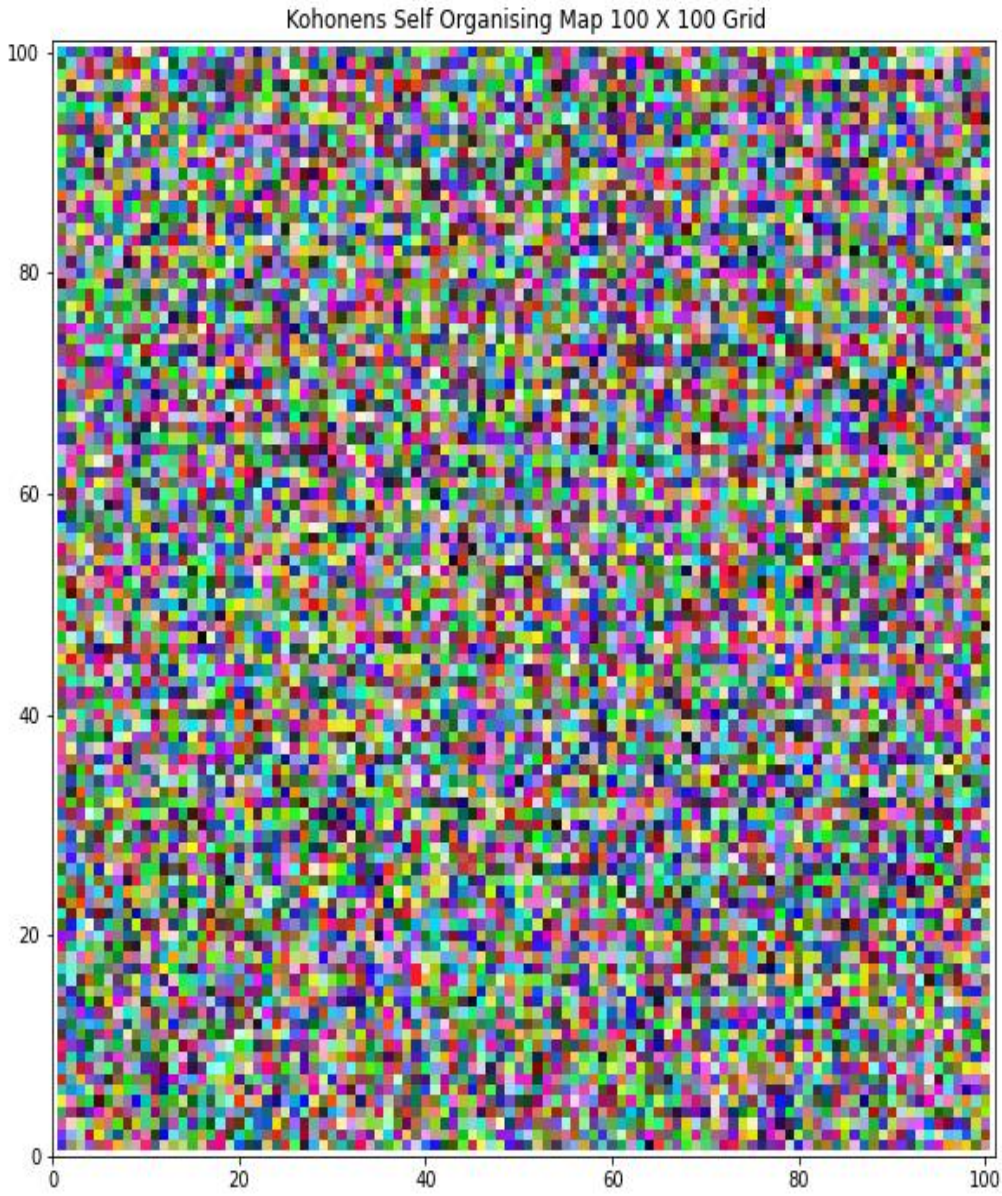
GRID AT 40 EPOCHS

Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090



GRID AT 100 EPOCHS

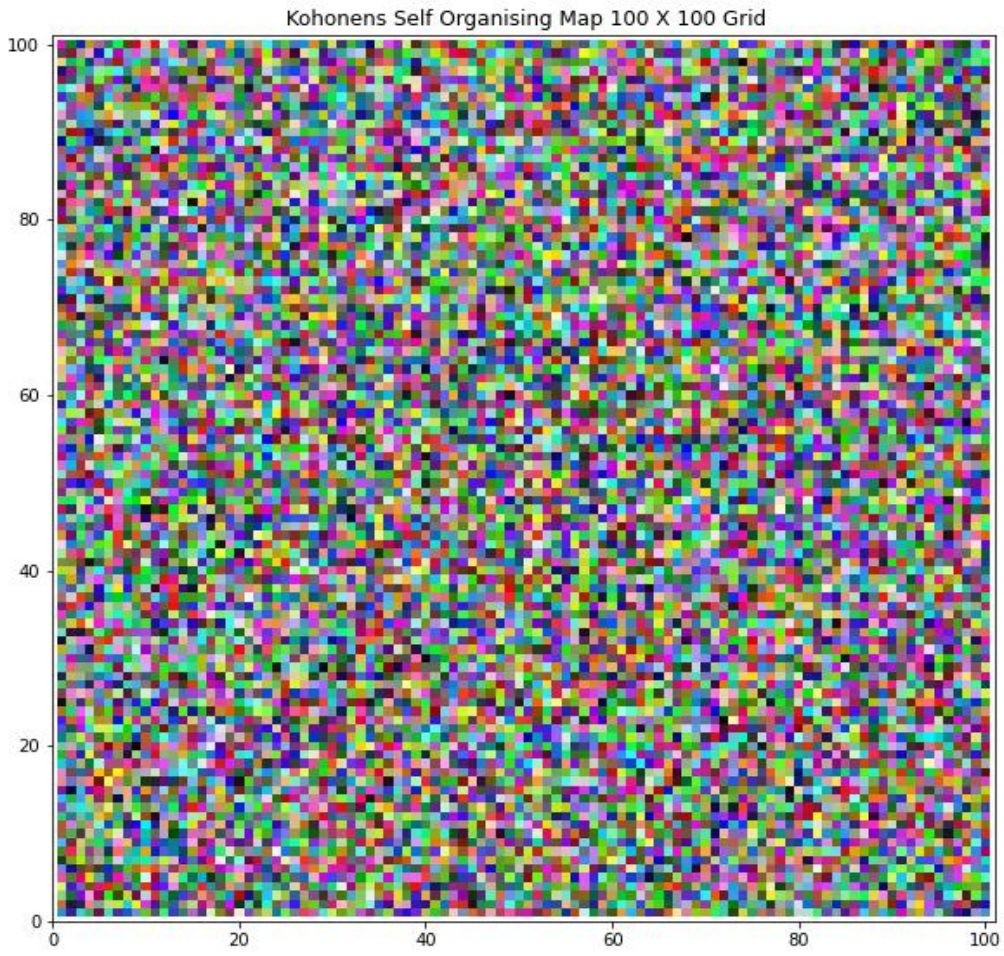
Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090



GRID AT 1000 EPOCHS

Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090

The SOM figures for the original grid and at 20 , 40 , 100 and 1000 epochs when $\sigma_o = 10$ is shown below

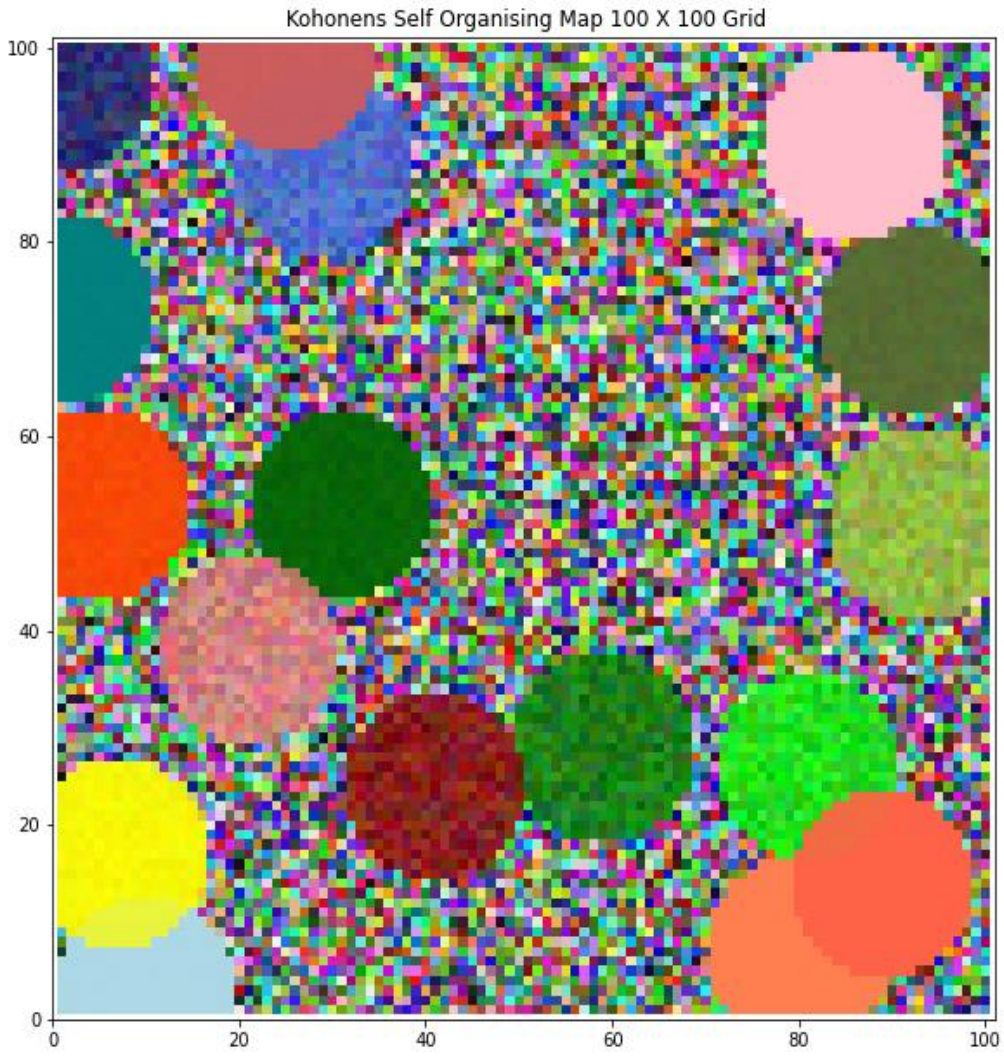


ORIGINAL GRID

Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090

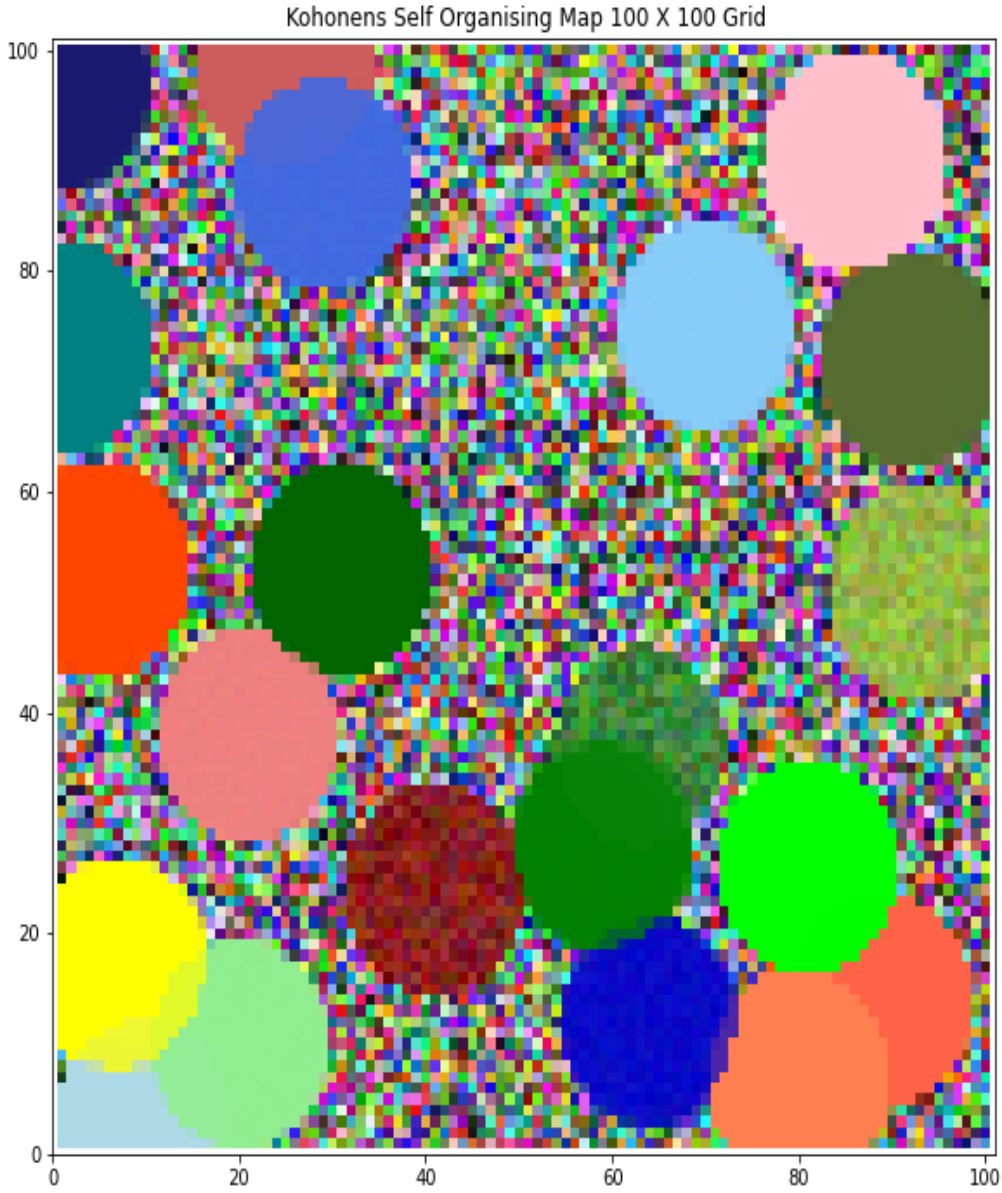
GRID AT 20 EPOCHS

Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090



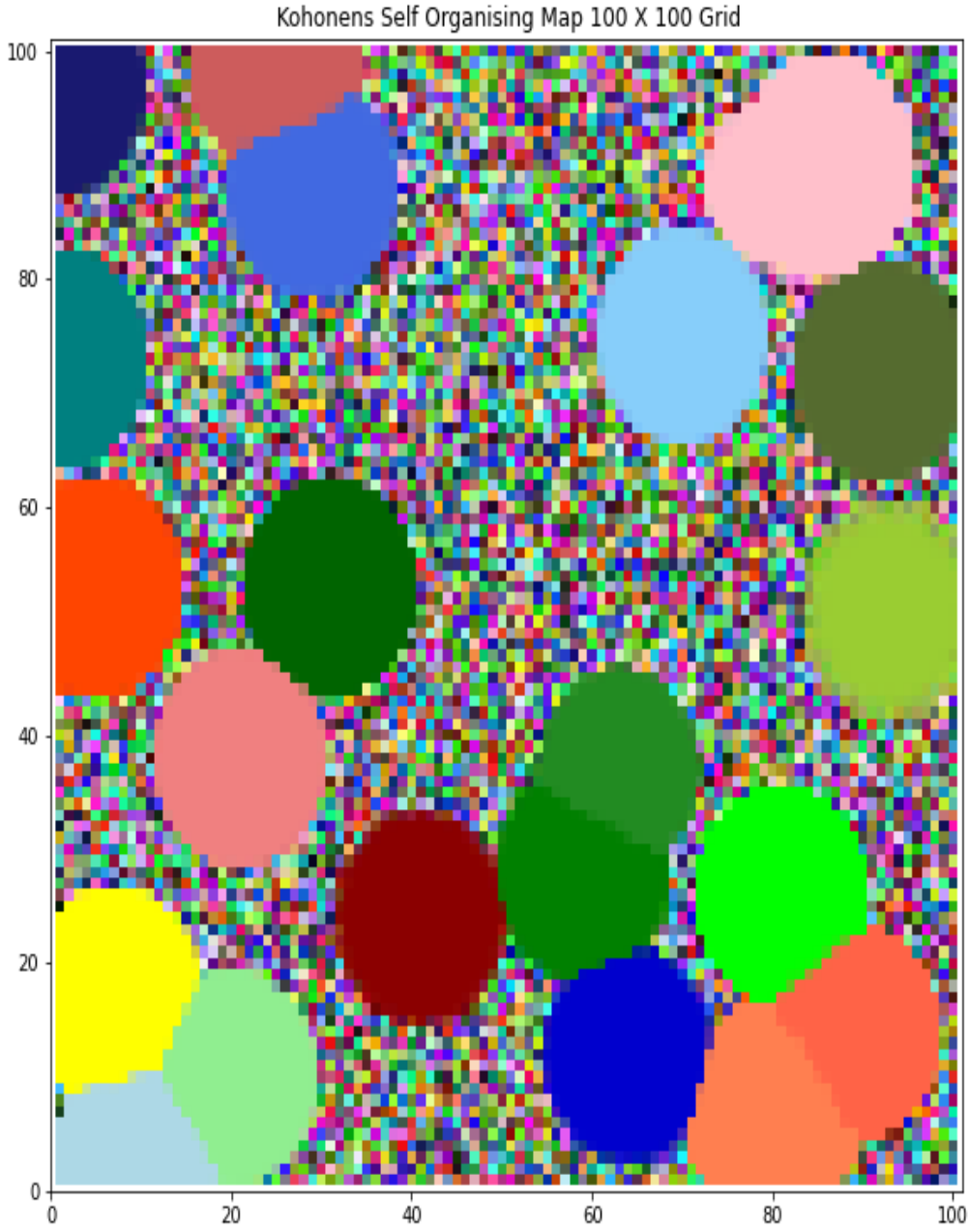
GRID AT 40 EPOCHS

Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090



GRID AT 100 EPOCHS

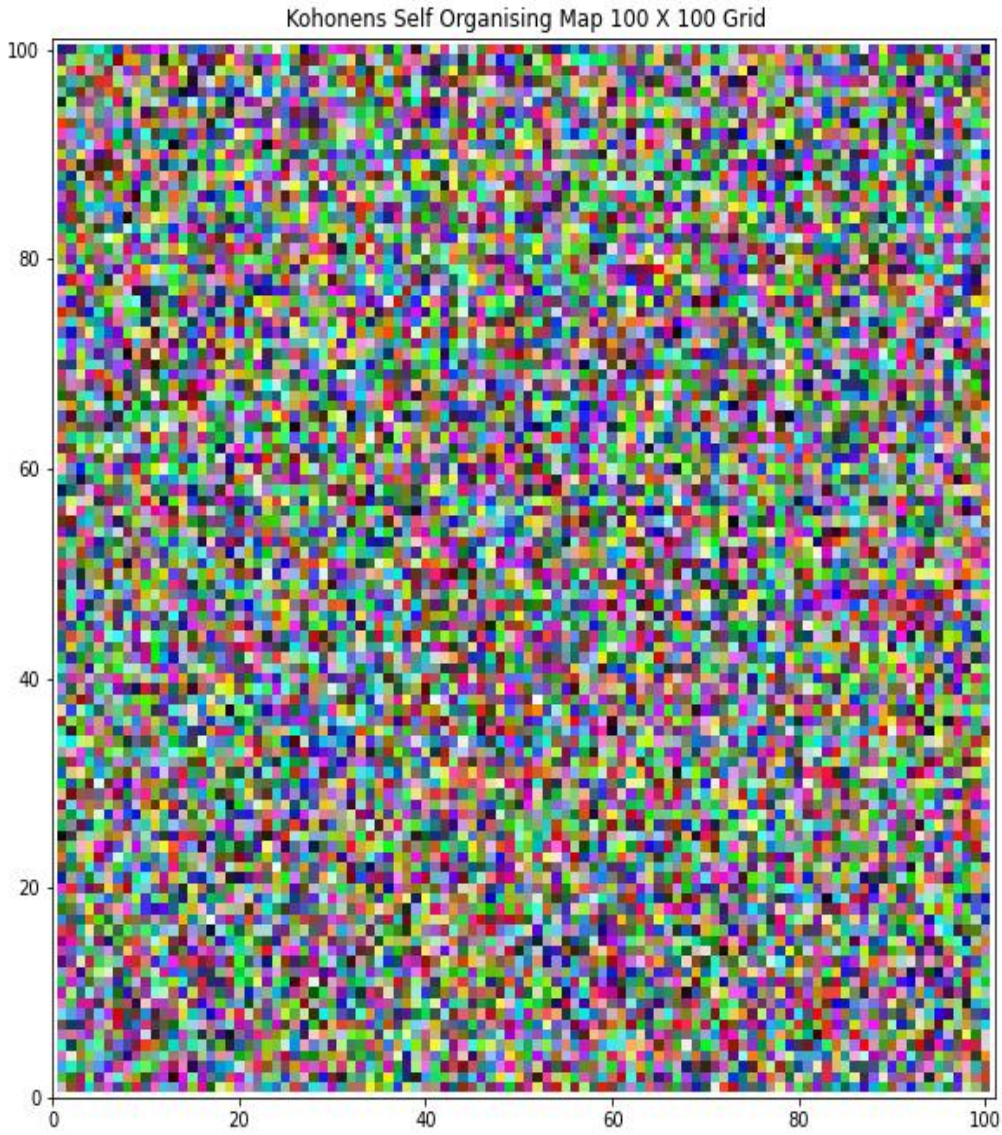
Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090



GRID AT 1000 EPOCHS

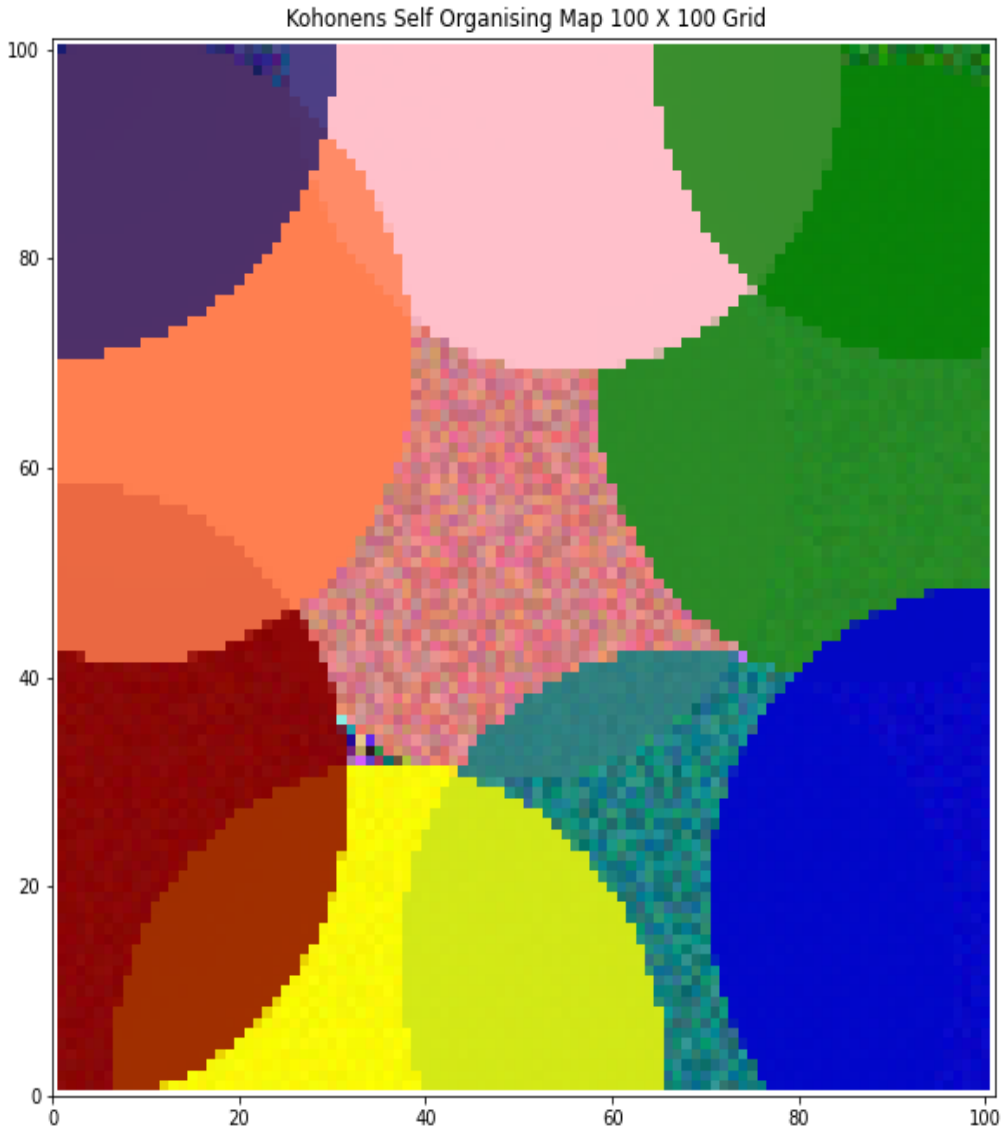
Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090

The SOM figures for the original grid and at 20 , 40 , 100 and 1000 epochs when $\sigma_o = 30$ is shown below



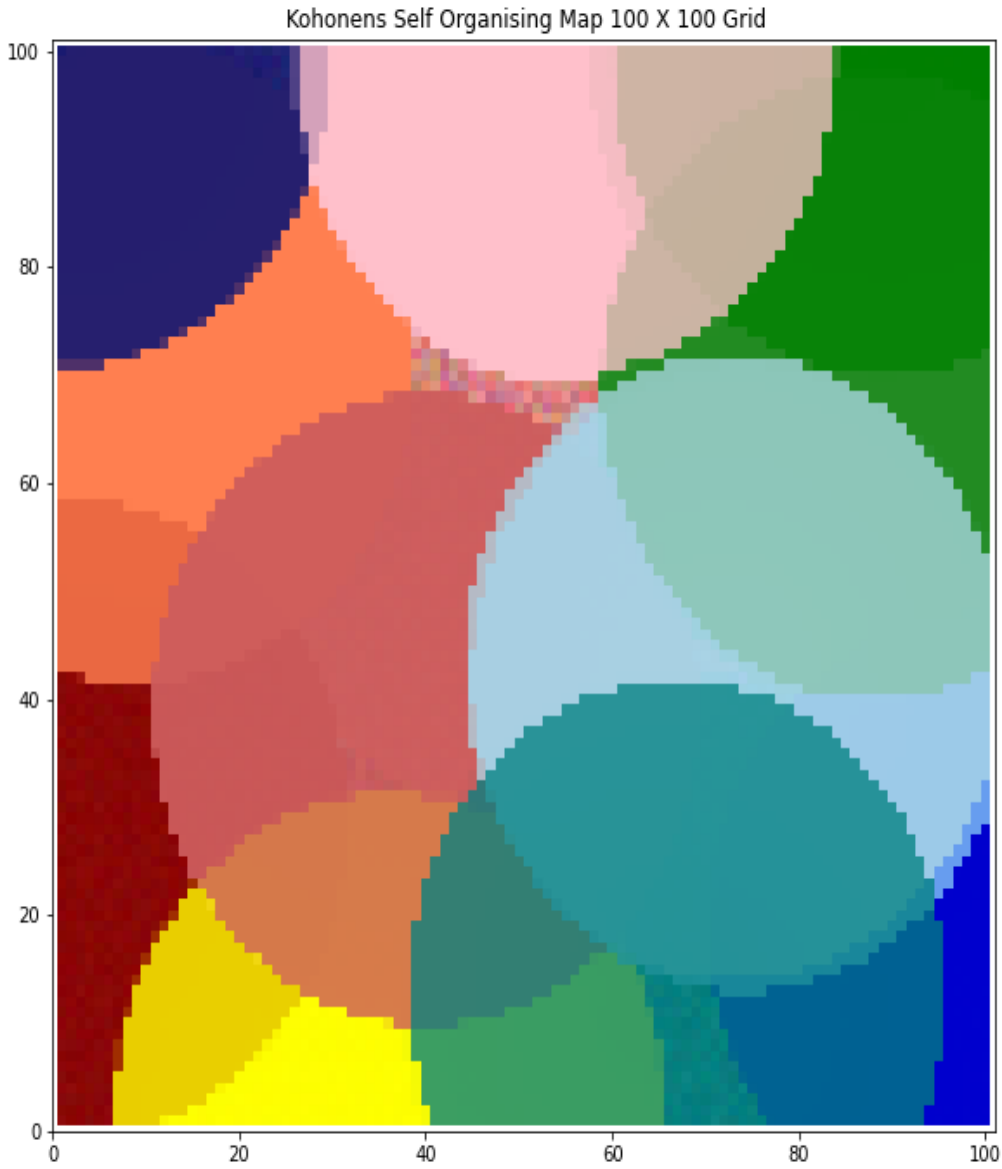
ORIGINAL GRID

Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090



GRID AT 20 EPOCHS

Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090

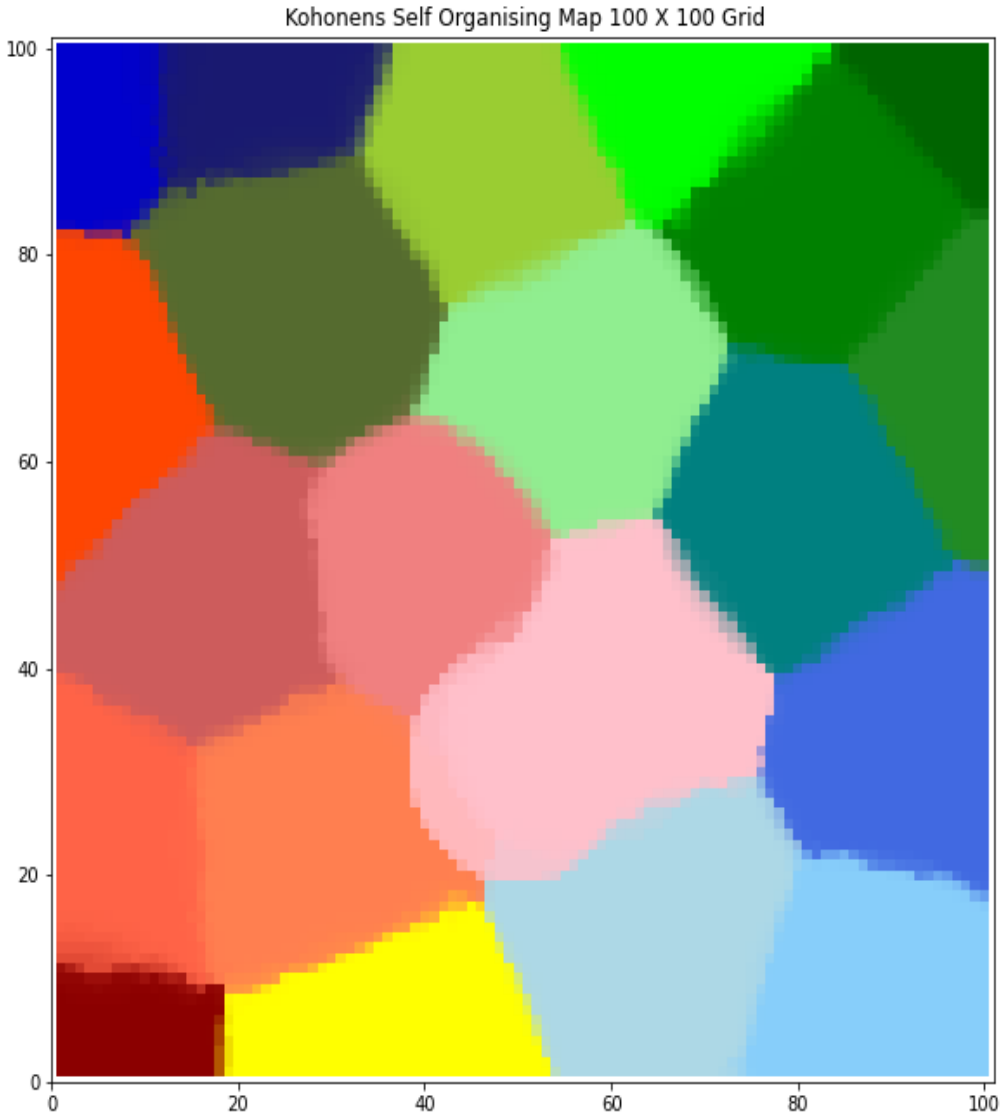


GRID AT 40 EPOCHS

Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090

GRID AT 100 EPOCHS

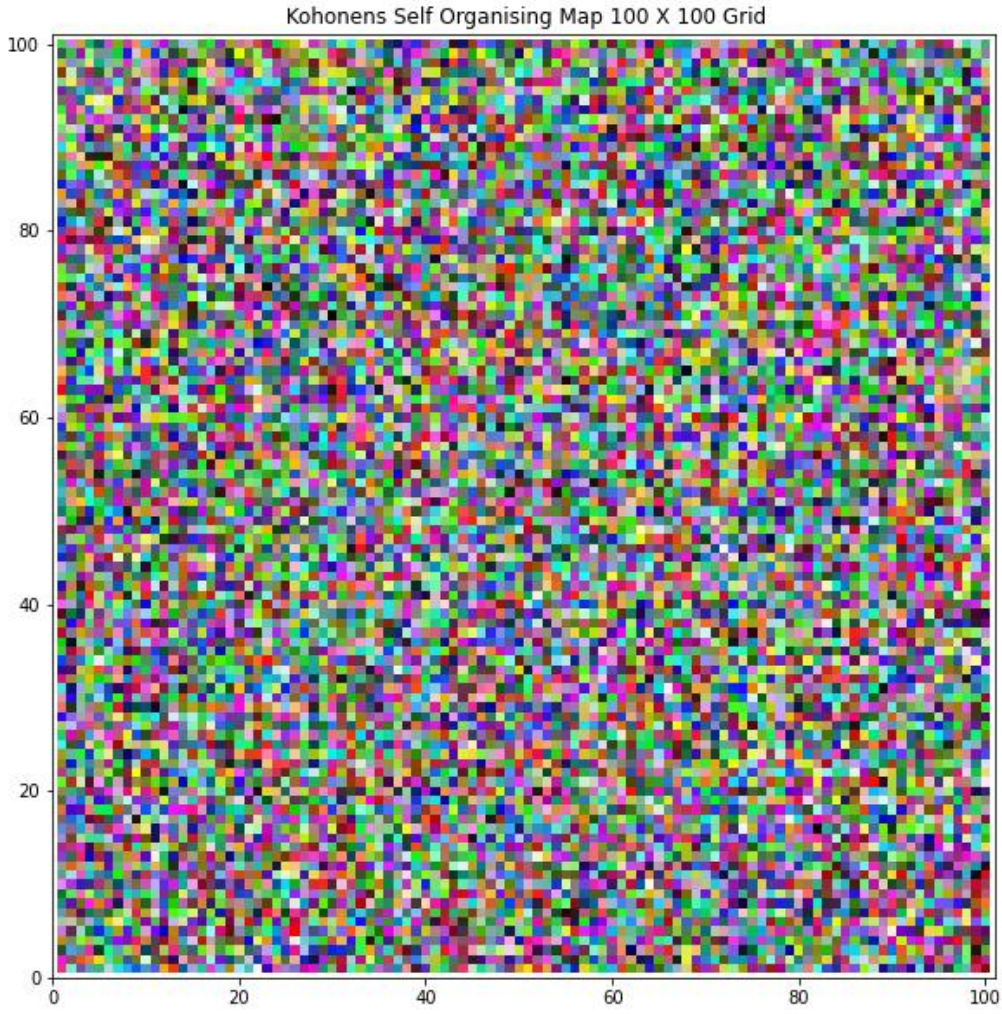
Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090



GRID AT 1000 EPOCHS

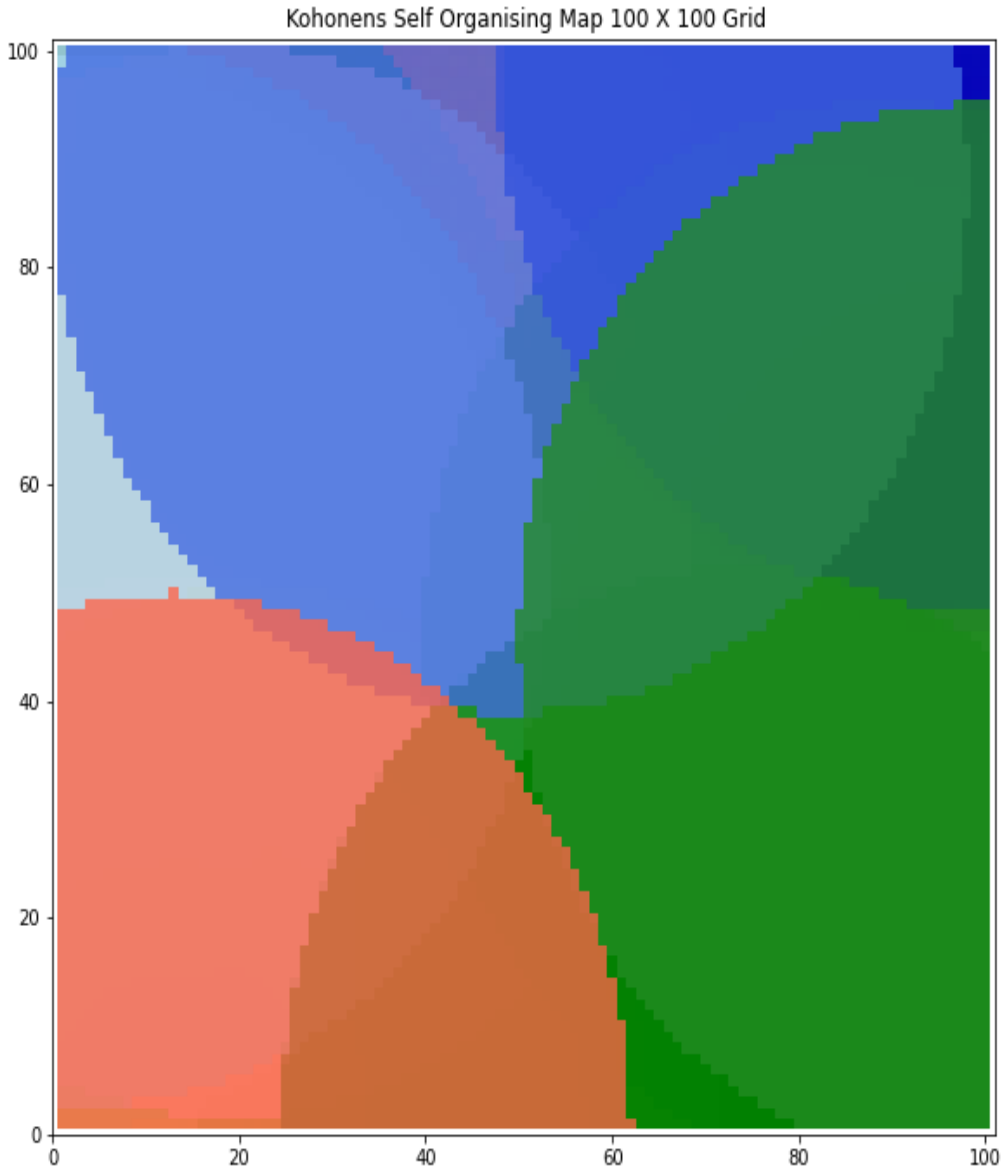
Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090

The SOM figures for the original grid and at 20 , 40 , 100 and 1000 epochs when $\sigma_o = 50$ is shown below



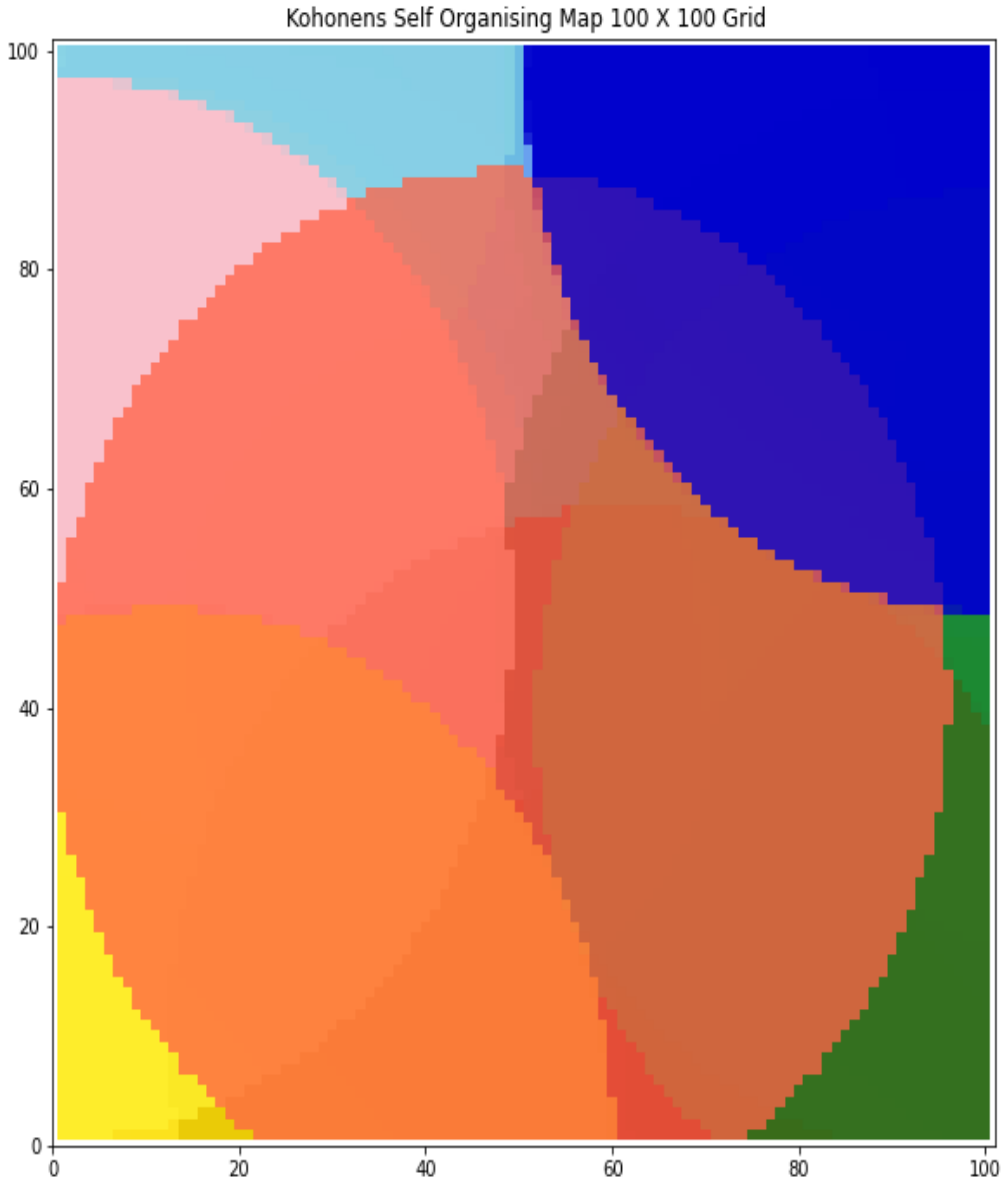
ORIGINAL GRID

Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090



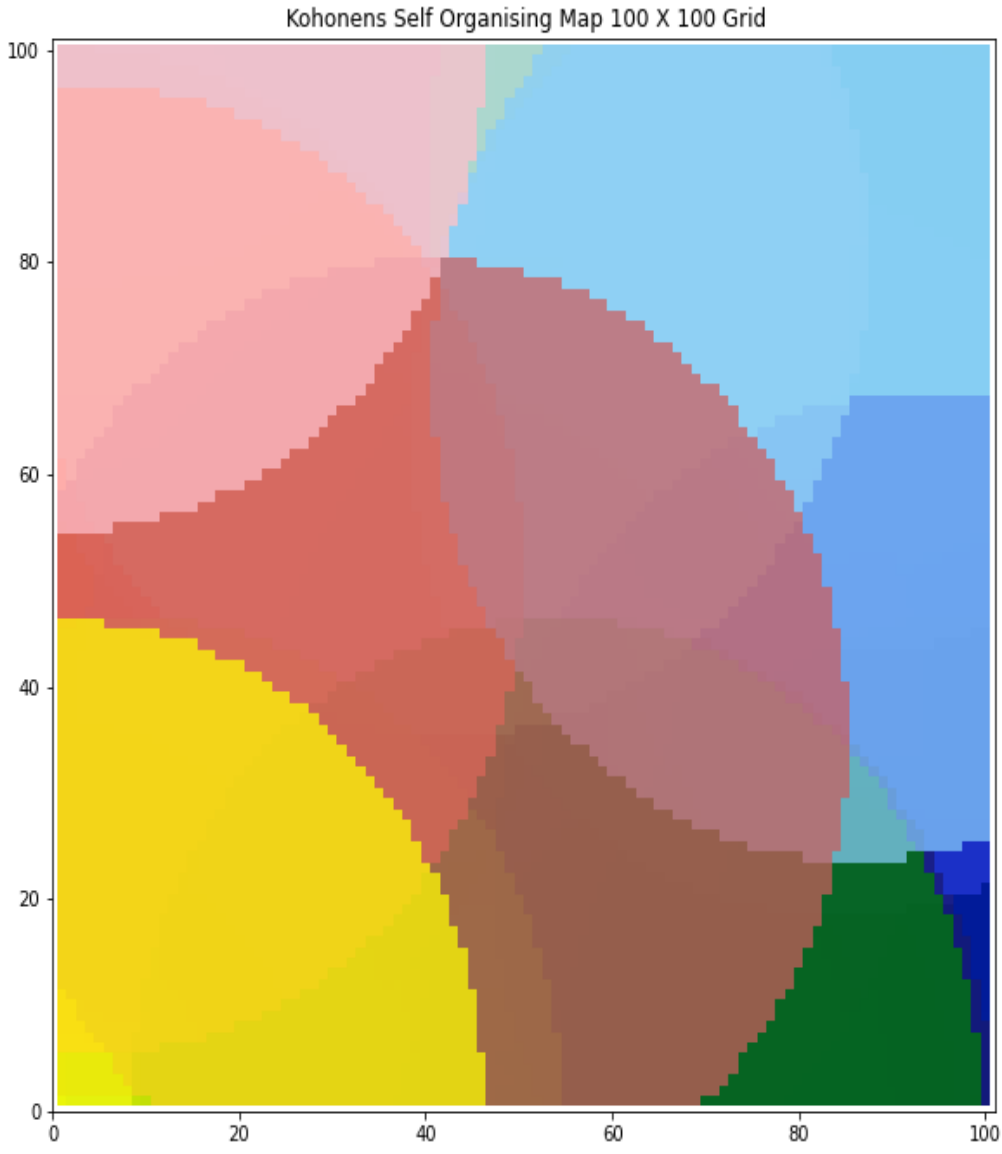
GRID AT 20 EPOCHS

Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090



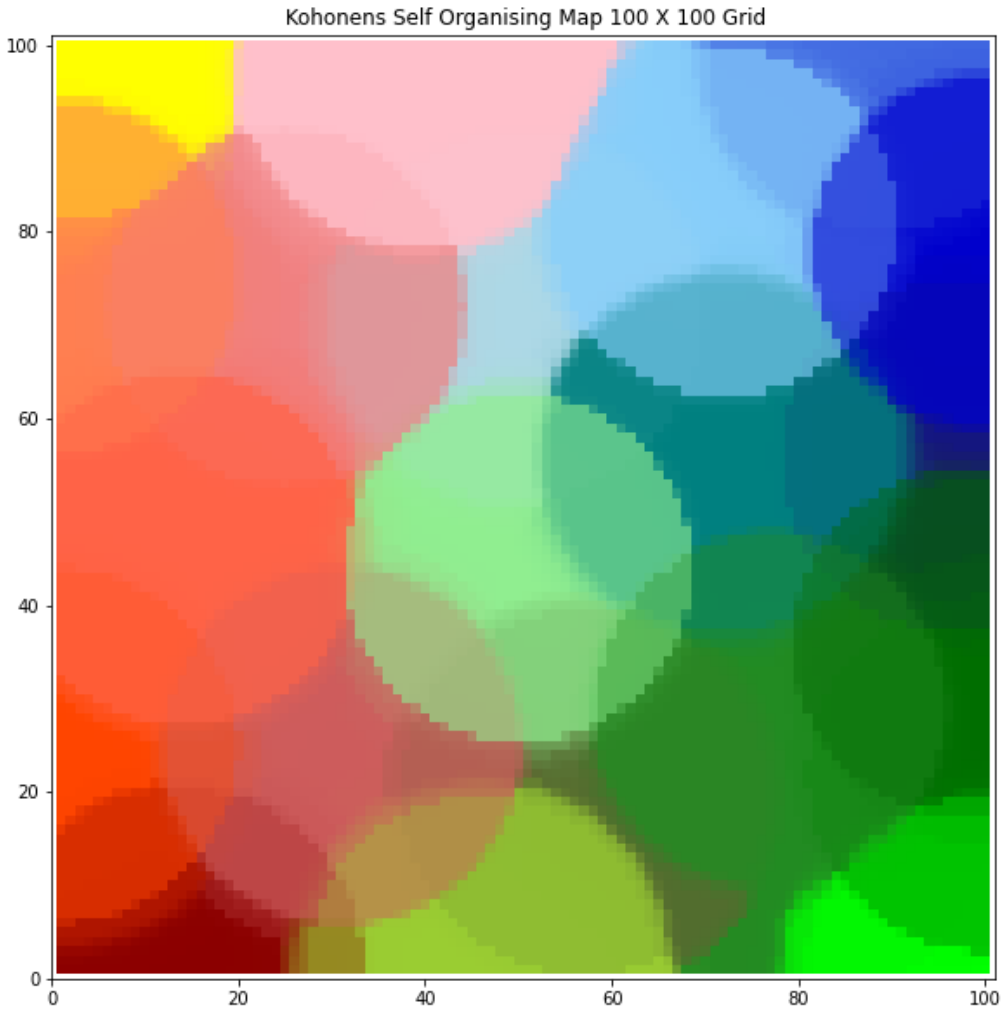
GRID AT 40 EPOCHS

Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090



GRID AT 100 EPOCHS

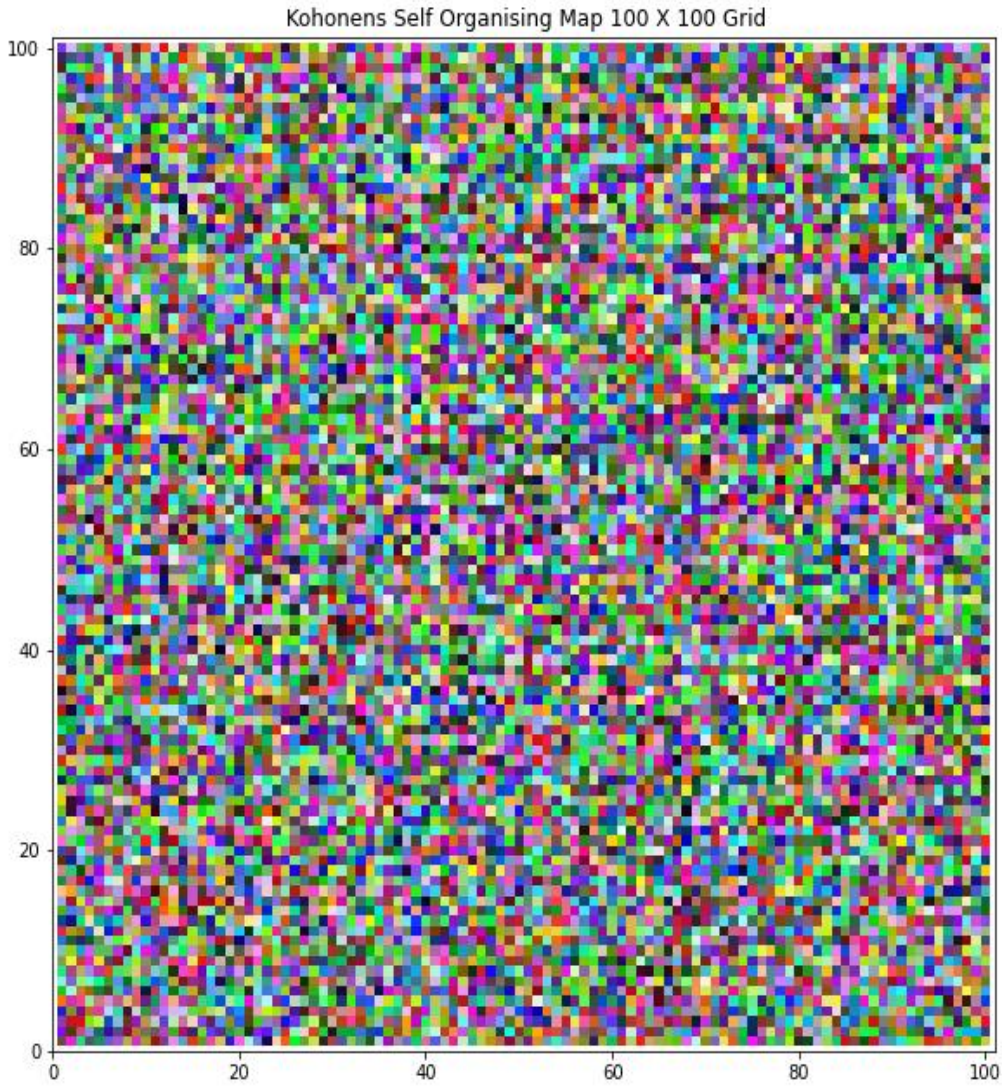
Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090



GRID AT 1000 EPOCHS

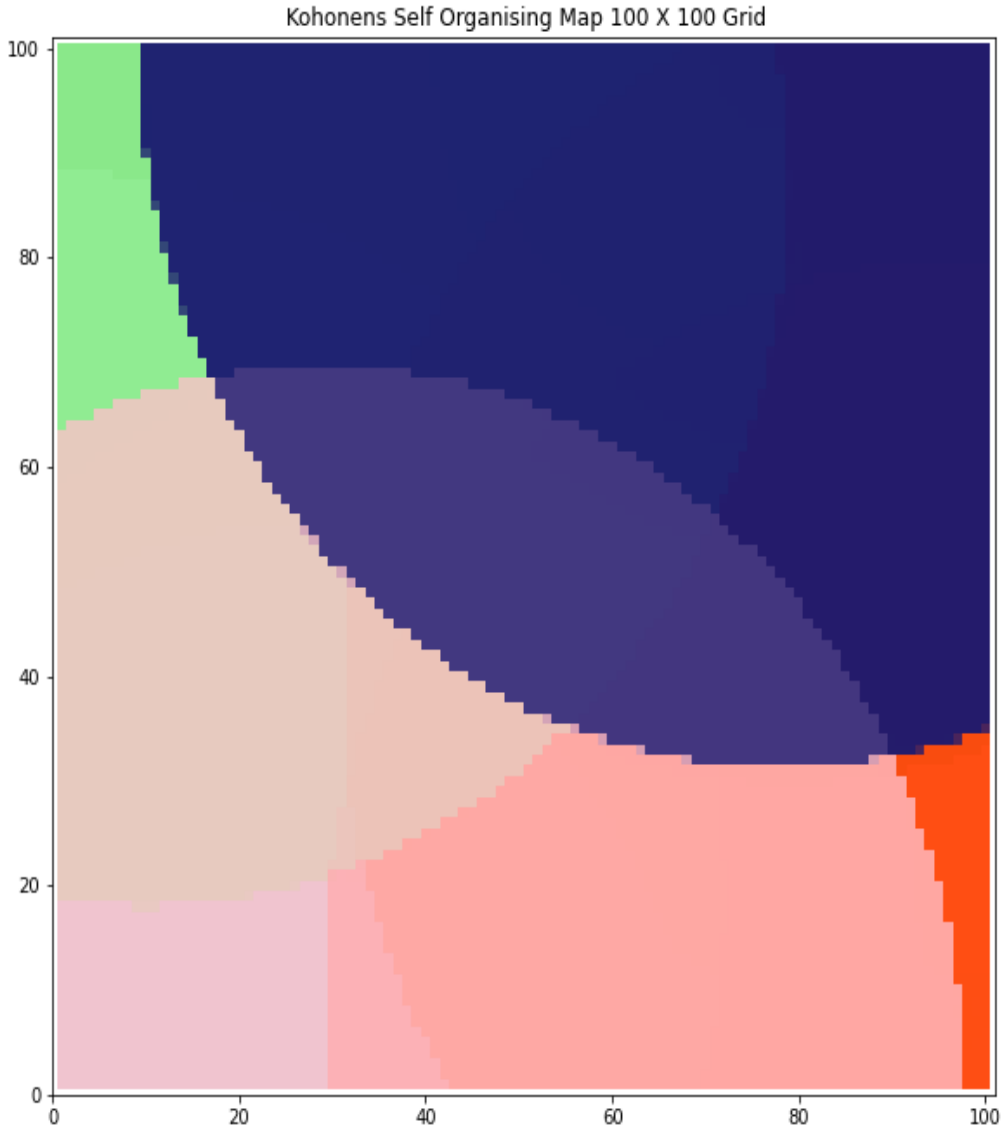
Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090

The SOM figures for the original grid and at 20 , 40 , 100 and 1000 epochs when $\sigma_o = 70$ is shown below



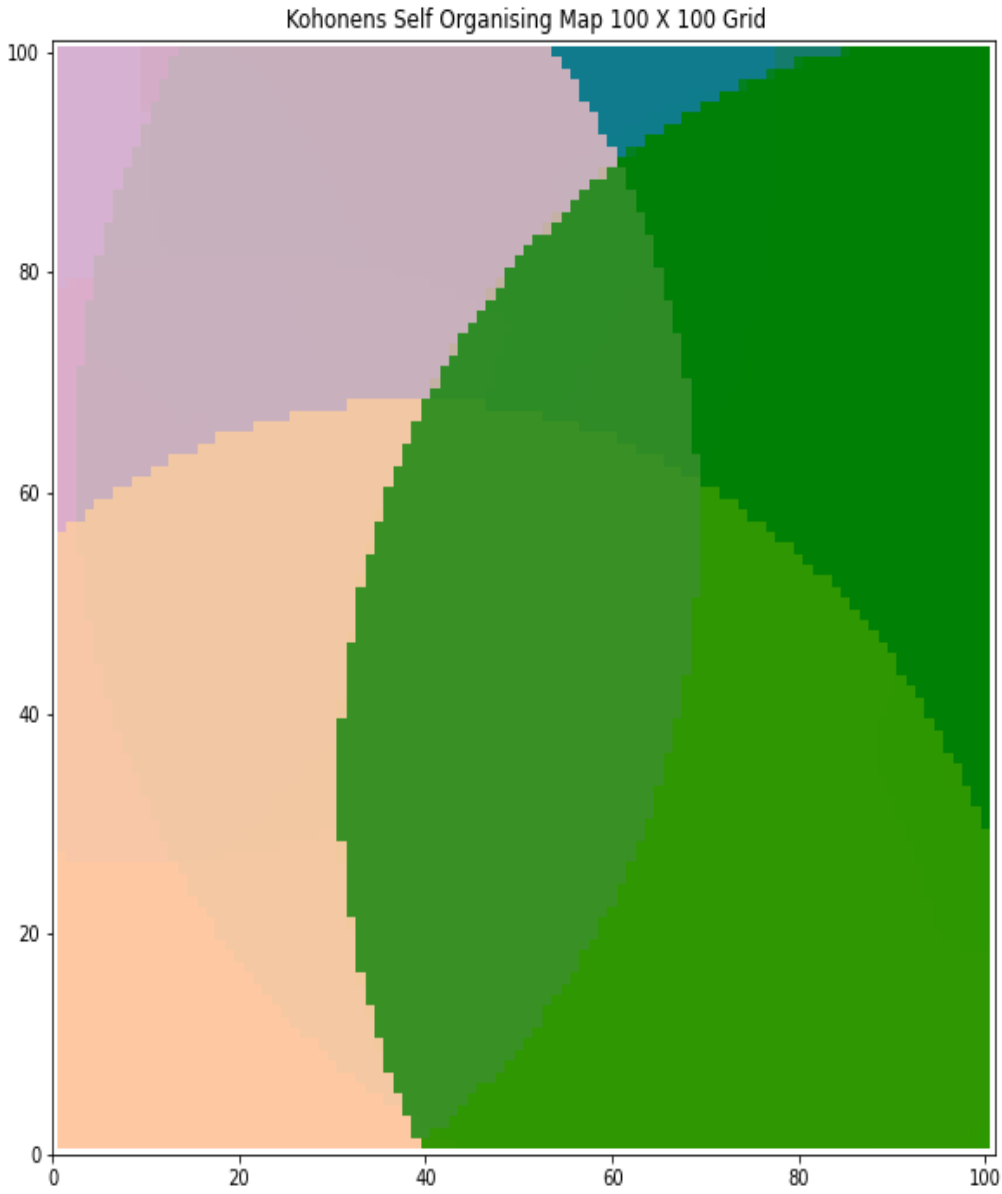
ORIGINAL GRID

Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090



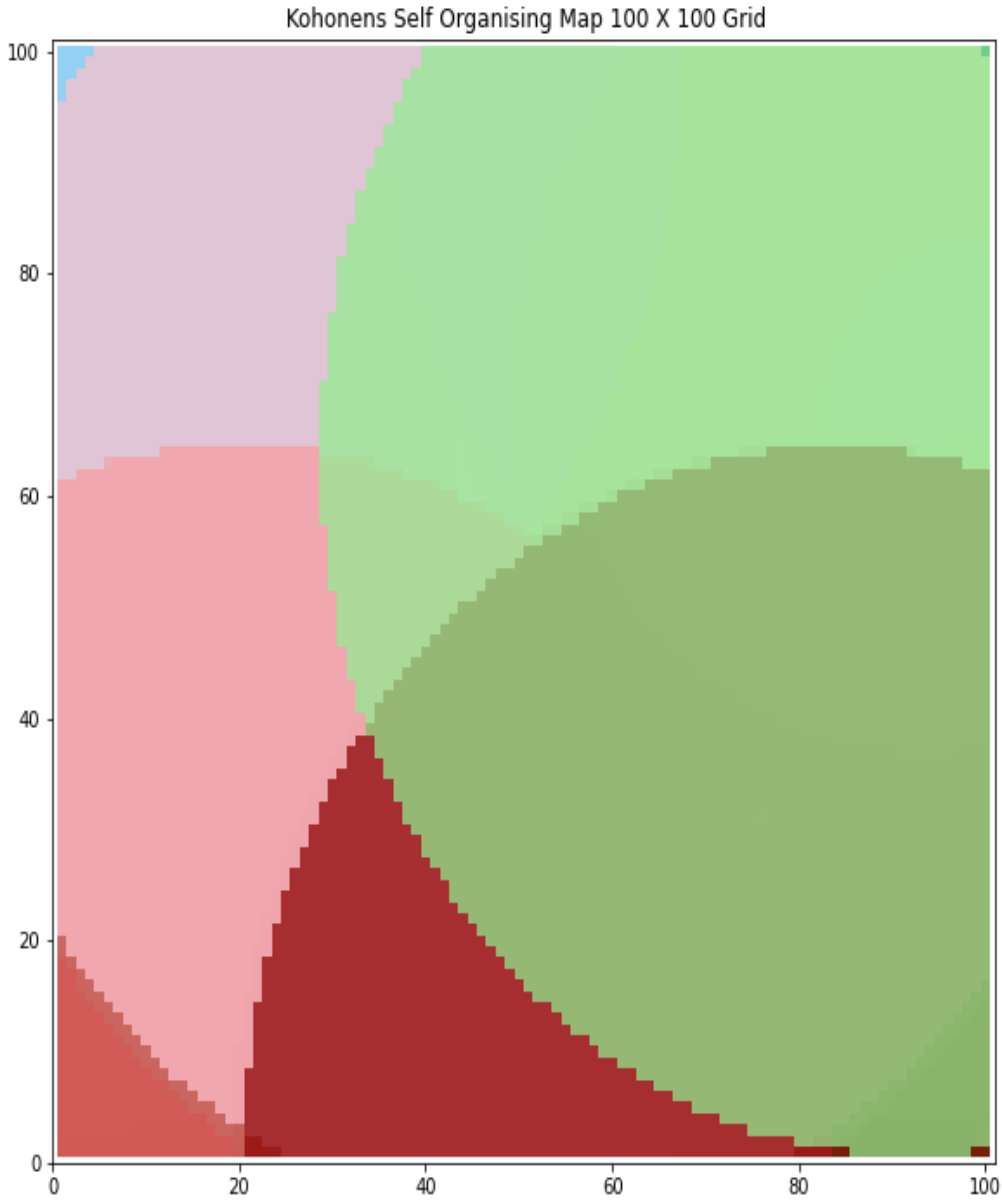
GRID AT 20 EPOCHS

Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090



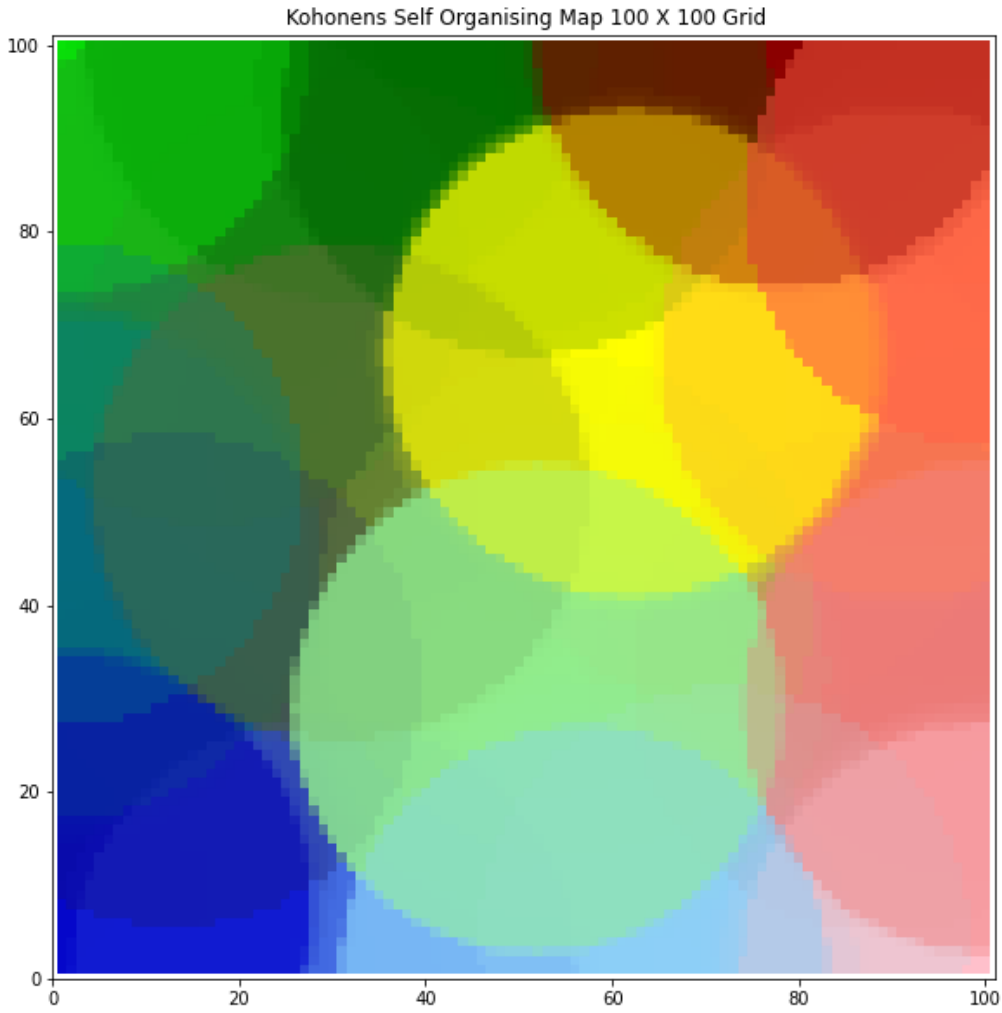
GRID AT 40 EPOCHS

Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090



GRID AT 100 EPOCHS

Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090



GRID AT 1000 EPOCHS

Solution presented by OKPALA WALTER AND ID:20910035
HALIM RATMONO ID: 20921090

N0 4 B

As σ_o increases the initial size of the neighbourhood increases which implies that the number of neighbour neurons that are updated increases hence the larger circle at the beginning of each training. However, as number of epochs increases there is a decay in the size of sigma, resulting in smaller and smaller neighborhoods to update, leading to the reduction of these colored circles overtime. As σ_o and the number of epochs increases the emerging outputs shows that the SOM becomes better at separating the colours on the 2D grid.