ML ASSIGNMENT 10
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Introduction

We were supposed to form a Kohonen network with 100 neurons arranged in the form of a two-dimensional lattice with 10 rows and 10 columns and use 1500 randomly generated neutrons to train our model.

Lastly we use the following test set to test our created Kohonen Network.

$X_1=[0.1 \ \ 0.8]^T$, $X_2=[0.5 \ \ -0.2]^T$, $X_3=[-0.8 \ \ -0.9]^T$, $X_4=[-0.0.6 \ \ 0.9]^T$.

The zip file mailed consists of “IIT2018178.py” and “IIT2018178.ipynb”. However these two files consists of exactly the same codes and the only difference would be of the graphs being displayed. In the “ipynb” file we have 2 graphs displayed that is our initial Kohonen Network and Kohonen Network after 50000 iterations of training our network, and the “py” file consists of only one graph of kohonen network that is the kohonen network formed after training the network.

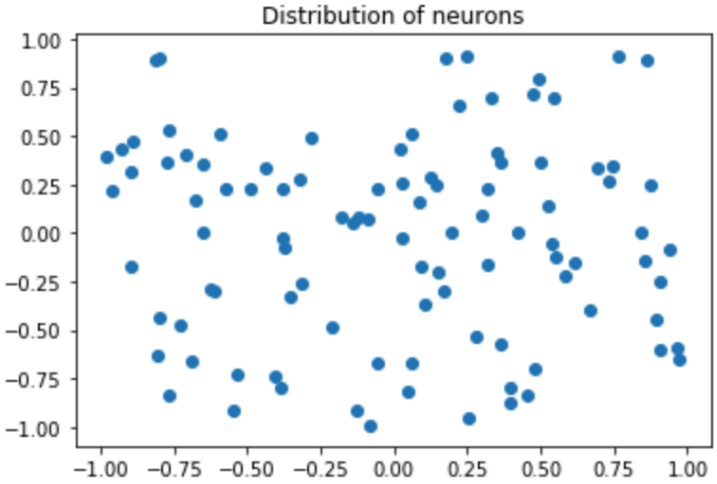
After each 10000 iterations, the number of iterations completed is printed. As this whole process takes a little time, thus this is just to ensure that it is working properly. It takes around 2-5 minutes to run the program, so until you can notice the number of iterations completed, please do not pause it.

Lastly, we test our network by finding the neuron that is activated for each of our test inputs.

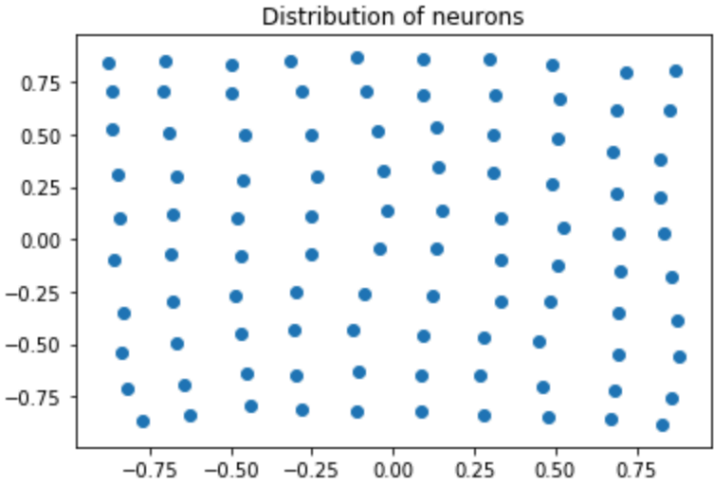
The results are shown in the next page.

Results

The output of the “ipynb” file is :




```
100 iterations completed
1000 iterations completed
10000 iterations completed
20000 iterations completed
30000 iterations completed
40000 iterations completed
50000 iterations completed
```



The output of “py” file is as follows :

```
100 iterations completed
1000 iterations completed
10000 iterations completed
20000 iterations completed
30000 iterations completed
40000 iterations completed
50000 iterations completed
The acitvated neuron is :  [0.06473034 0.7563442 ]  and the distance from neuron is :  0.05612288224097742
The acitvated neuron is :  [ 0.54520106 -0.17852132]  and the distance from neuron is :  0.05004467655860143
The acitvated neuron is :  [-0.85130833 -0.81971286]  and the distance from neuron is :  0.095281527158131
The acitvated neuron is :  [-0.62786178  0.83982618]  and the distance from neuron is :  0.06631113804099557
```