



भारतीय सूचना प्रौद्योगिकी संस्थान गुवाहाटी

INDIAN INSTITUTE OF INFORMATION TECHNOLOGY GUWAHATI

CS 360: Machine Learning Lab
Practice Assignment 9

Instructions: This is only for practice. Complete it by 12:00 PM today. Your completion will be reviewed by the Teaching Assistants.

1. Write a program to group/ cluster the customers into different categories using Self Organizing Map (SOM) algorithm (**without using in-built Python library/ packages**).

Consider the following :

1. Neighborhood function: Gaussian neighborhood function.
2. SOM architecture: 1-D or 2-D.
3. Number of output neurons: 8.

Hint: In case of 2-D SOM, you consider a grid of size 2×4 or 4×2 , for 8 output neurons.

4. w = random initialization.
5. Width of gaussian neighborhood, σ : 2.5 (linearly decaying to 1).
6. learning rate, α : 0.5
7. Epochs: 100, 1000.
 - (a) Report and visualize the obtained clusters/ output map.
 - (b) Visualize the output Maps obtained, considering "Age", "Annual Income" and "Spending scores" as the discriminative feature, separately.
 - (c) Write your result analysis with interpretation about the plots (from 1(b)) and the final clusters obtained.

2. Implement Q.1(all sub-parts) using in-built Python packages for SOM.