Jincheng Tian machine learning hw2

Problem1:

Step size = 2.5

Chart, histogram

Description automatically generatedGraphical user interface, chart, scatter chart

Description automatically generated

Step size = 3.5

Graphical user interface, chart, histogram

Description automatically generatedGraphical user interface, chart, scatter chart

Description automatically generated

Step size. = 4.5

Graphical user interface, chart, scatter chart

Description automatically generatedGraphical user interface, chart, histogram

Description automatically generated

Therefore, as shown above, we have the graph of step size 2.5, 3.5, 4.5, as the step size increase, the loss would be fluctuated more.

Diagram

Description automatically generated

Text, letter

Description automatically generated

Text, letter

Description automatically generated

Text, letter

Description automatically generated

Text, letter

Description automatically generated

Text, letter

Description automatically generated

Text, letter

Description automatically generated

Problem 4 (10 points)  
What is the VC dimension of axis-aligned squares? Justify your answer.

3 is the VC dimension of axis-aligned squares. For example, we could have (1, 0), (0, 1), and (−1, 0) in one axis that are shattered by axis-aligned squres. To label two of these points, put two points at corner, then we have at least 3 as the vc dimension.

A picture containing whiteboard, light

Description automatically generated

If we have four points, it is the same situation. Therefore, the VC-demisino in the plane would be 3