

Pattern Classification Homework #6

1. (a) For the set of samples

$$\{x = -7, -5, -4, -3, -2, 0, 2, 3, 4, 5, 7\}$$

Taking them in sequence, find the Parzen window estimate to $p_j(x)$ for a rectangular window. Use $h_j = 1/\sqrt{j}$. Sketch the results as a function of x for $j=1,4,11$.

(b) Suppose $h_j = h/\sqrt{j}$ where h is a constant chosen at the beginning. Comment on the shape of $p_j(x)$ for various choices of h .

2. For the following samples in a one-dimensional problem:

$$x_1, x_2, \dots, x_{16} = 0, 1, 3, 4.5, 5.5, 6.0, 6.5, 7.0, 7.2, 7.5, 8.0, 8.8, 9.2, 9.3, 11, 13$$

Give the values of the k -nearest neighbor estimate $p_j(x)$, for $j=16$ and $k_j = \sqrt{j}$, at $x=2$, $x=4$, $x=6$, and $x=10$.