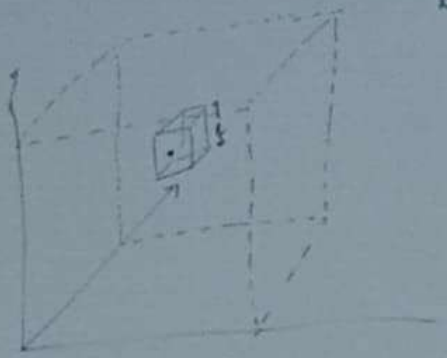
Unit cube $[0,1]^d$



l: edge length of the smallest hypercube that contains all K nearest neighbors of the test point

$$l^d \approx \frac{K}{n}$$

$$l \approx \left(\frac{K}{n}\right)^{1/d}$$

$K = 10$

$n = 1000$

$l = \frac{1}{10} = 0.1$

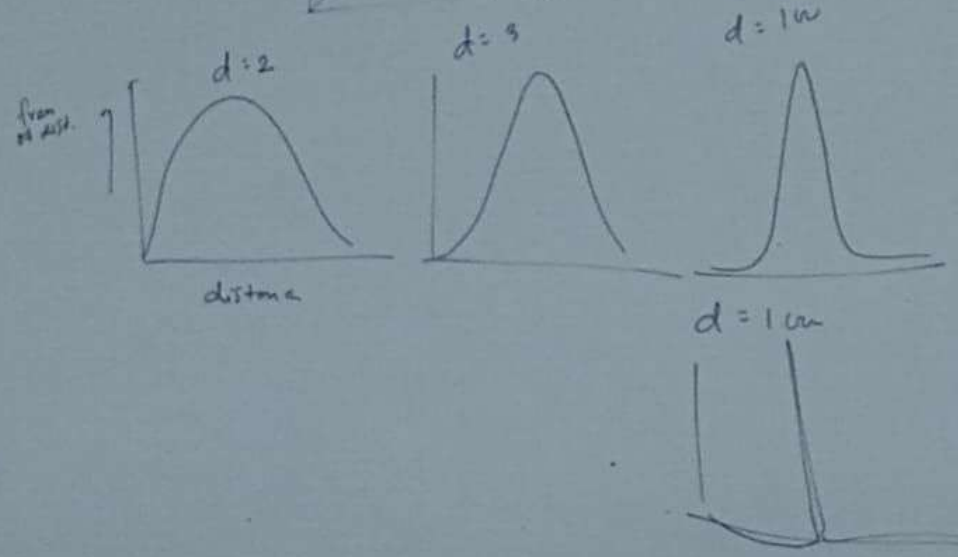
$n = \frac{K}{l^d} = K \times 10^d$

$d = 10$

$d = 100$

$d = 1000$

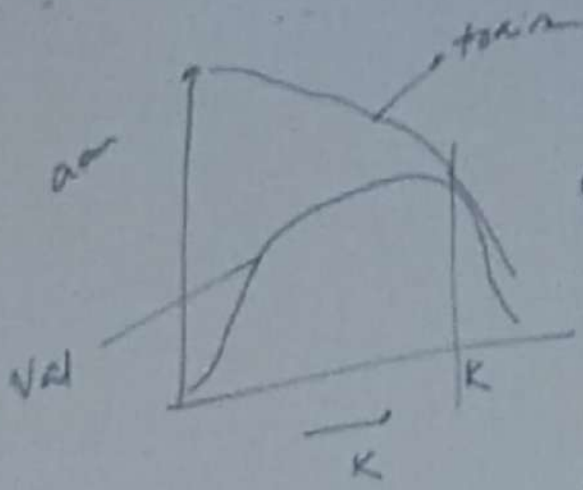
d	l
2	0.1
10	0.63
100	0.955
1000	0.9954



l = edge len
K ne

K = 1

↑ high variance



K = 5

K = 100

high bias