Machine Learning

Mid

① :- KNN Classifier :-

	x_1	y_1	z_1		
Sr.	H/L	W	Color	Animal	Rank
1	40	60	B	Cat	③
2	45	50	B	Dog	②
3	60	10	M	Cat	⑤
4	50	8	B	Lion	④
5	30	20	B	Dog	①
6	20	30	M	P	→ Dog
	X	Y	Z		

$$\text{Distance} = (x-x_0)^2 + (y-y_0) + (z-z)^2 = P$$

$$D(o,1) = (20-40)^2 + (30-60)^2 + (M-B)^2$$

$$= 400 + 900 + 1$$

$$D(o,1) = 1301 \longrightarrow ③$$

$$D(o,2) = (20-45)^2 + (30-50)^2 + (M-B)^2$$

$$= 625 + 400 + 1$$

$$D(o,2) = 1026 \longrightarrow ②$$

$D(o,3) = (20-60)^2 + (30-10)^2 + (M-M)^2$

$= 1600 + 400 + 0$

$\boxed{D(o,3) = 2000}$ → (5)

$D(o,4) = (20-50)^2 + (30-8)^2 + (M-B)^2$

$= 900 + 484 + 1$

$\boxed{D(o,4) = 1385}$ → (4)

$D(o,5) = (20-30)^2 + (30-20)^2 + (M-B)^2$

$= 100 + 100 + 1$

$\boxed{D(o,5) = 201}$ → (1)

Ranking:

$D(o,5) = 201 \rightarrow (1)$ (Dog)

$D(o,2) = 1026 \rightarrow (2)$ (Dog)

$D(o,1) = 1301 \rightarrow (3)$ (Cat)

$D(o,4) = 1385 \rightarrow (4)$ (Lion)

$D(o,3) = 2000 \rightarrow (5)$ ~~(Dog)~~ (cat)

These creates equality

So, We choose $\boxed{K=3}$

and remove (2)

(highest values).

K=3 → (odd)

Remaining :-

D(o,5) = 201 → ① (Dog)
D(o,2) = 1026 → ② (Dog)
D(o,1) = 1301 → ③ (cat)

Now, Voting

So, Target is DOG

D(o,6) = DOG

Graph :-