KNN
K nearest Neighbours

X_1 ... X_2 (axes)

new point

1. Euclidean Distance

$$\text{Euclidean} \quad \sqrt{\sum_{i=1}^{k}(x_i - y_i)^2}$$

2. Manhattan Distance

$$\text{Manhattan} \quad \sum_{i=1}^{k}|x_i - y_i|$$

3. Hamming Distance

$$D_H = \sum_{i=1}^{k}|x_i - y_i|$$
$$x = y \Rightarrow D = 0$$
$$x \neq y \Rightarrow D = 1$$
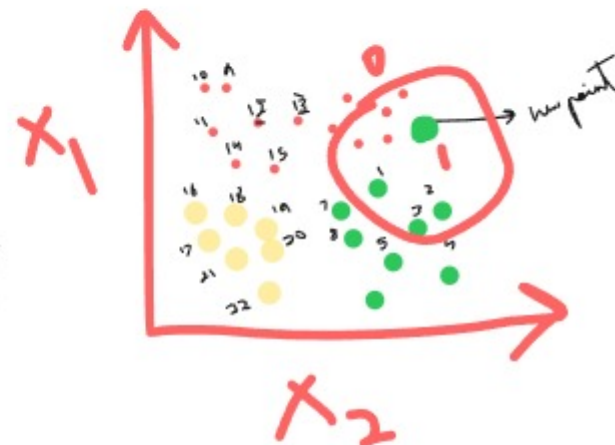
ID	Height	Age	Weight
1	5	45	77
2	5.11	26	47
3	5.6	30	55
4	5.9	34	59
5	4.8	40	72
6	5.8	36	60
7	5.3	19	40
8	5.8	28	60
9	5.5	23	45
10	5.6	32	58
11	5.5	38	?
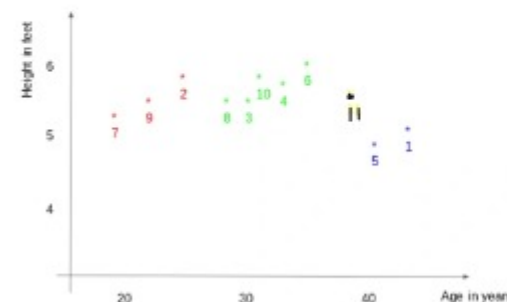
For classification:
we check the closest neighbours
and the majority class is assigned
to the new point

$$\frac{209}{3} \approx 69\,kg$$

For regression:
the closest points and there
given value of output variable
is averaged and is assigned as
the prediction for new point