

Mean of a Data Matrix:

In this we take mean of each feature for a new vector called mean vector.

Example for iris we take mean of each feature [SL, SW, PL, PW] and therefore we get 4 means and finally with this 4 means we get a mean vector. This mean vector says the **central value** of the whole datapoints.

Handwritten mathematical derivation of the mean vector formula:

$$x_1 = \begin{bmatrix} f_1 \\ f_2 \end{bmatrix} = \begin{bmatrix} 2.2 \\ 4.2 \end{bmatrix} \in \mathbb{R}^2$$
$$x_2 = \begin{bmatrix} 1.2 \\ 3.2 \end{bmatrix} \in \mathbb{R}^2$$
$$x_1 + x_2 = \begin{bmatrix} 3.4 \\ 7.4 \end{bmatrix}$$
$$\bar{x} \in \mathbb{R}^d$$
$$\bar{x} = \frac{1}{n} \sum_{i=1}^n x_i = \frac{1}{n} (x_1 + x_2 + \dots + x_n)$$

Mean-vector

Below image shows example for height and weight features and finding mean vector.

