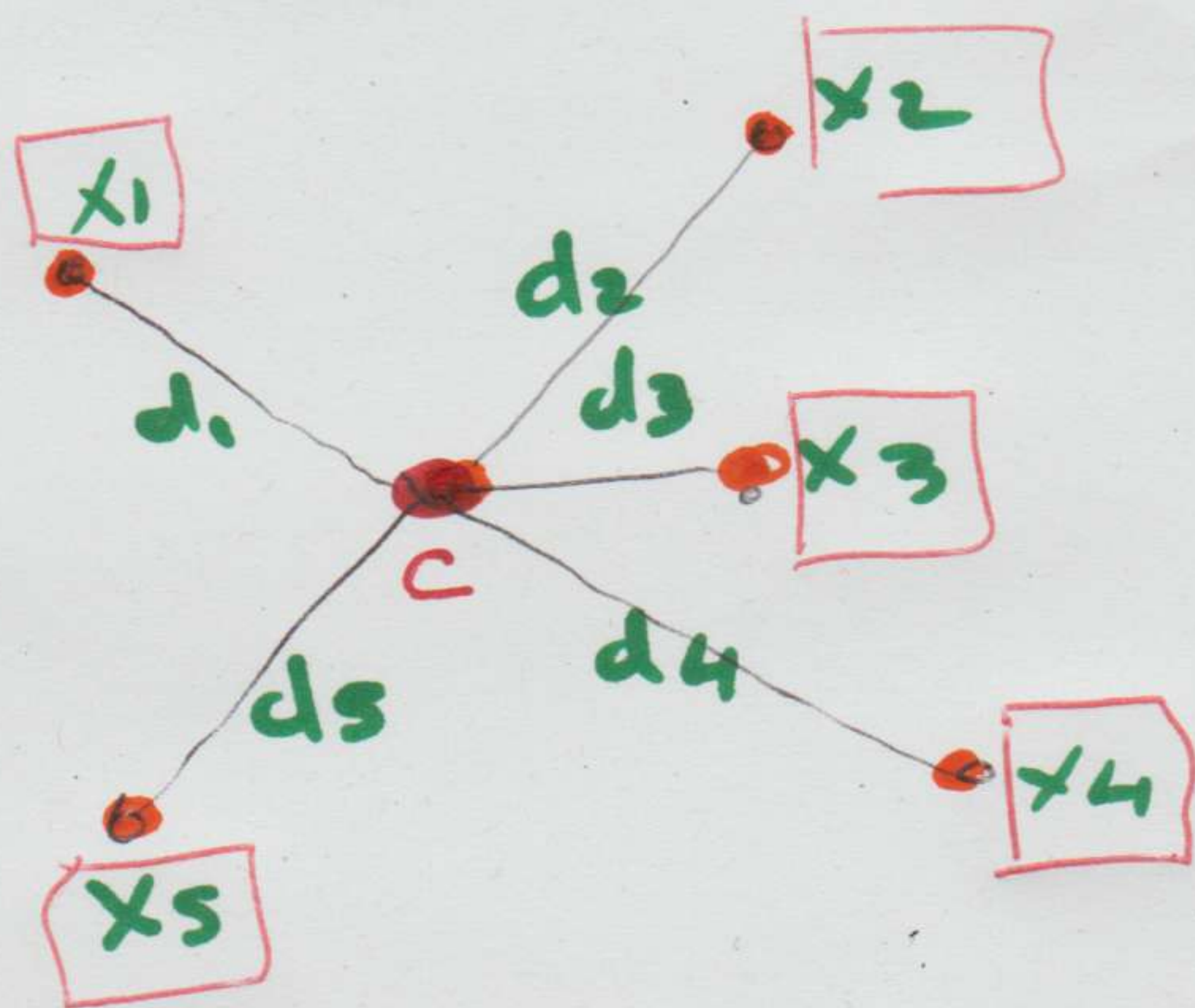# Within Cluster Variance

VARIANCE of the DISTANCE from each point in a cluster to the centroid of that cluster.

within cluster variance

$$\sim \text{VAR}(d_1, d_2, d_3, d_4, d_5).$$

correctly the formula is

$$W_K = \sum_{x_i \in C_k} \| X_i - \bar{X}_{k} \|^2$$

The total within cluster variance is the sum of W_k for all clusters.