

Unsupervised ML

quyidagi turlarga bo`linadi

1-Clustering

2-Dimensionality Reduction

3-Anomaly Detection

Clustering

Grouping Similar data points

(o`xshash malumotlarni guruhlaydi)

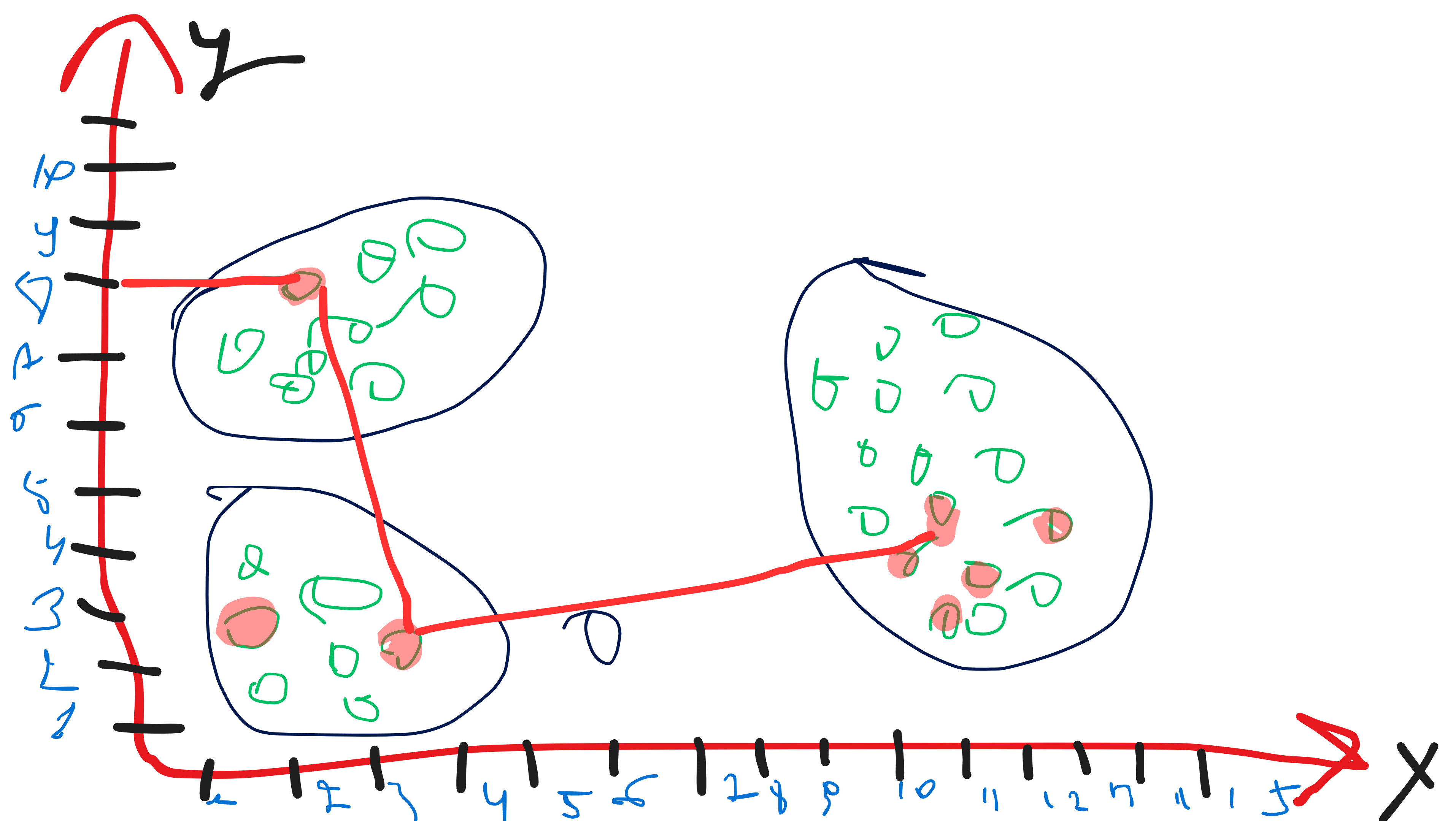
Applications

- Google >> o`xshash malumotlari
- Insonlarda Gen Taxlili
- Yulduzlar taxlil

Algorithm

K-Means Clustering

- **Assign cluster centroid**
- **Move cluster centroid**
- **K- number of cluster**



$$M = \frac{x^1 + x^3 + x^5 + x^7}{x^2}$$

$$(2,2) + (3,2) + (4,1) + (1,4)$$

11

$$(2,2)$$

4

11

4, 4

4

$$\mathcal{J} \left(C^{(i)}, \dots, C^{(K)}, \sqrt{M_1}, \dots, \sqrt{M_K} \right) =$$

$$= \frac{1}{M} \sum_{i=1}^M \left\| x^{(i)} - \mu \right\|_2^2$$

$\checkmark M = \text{Centroid}$

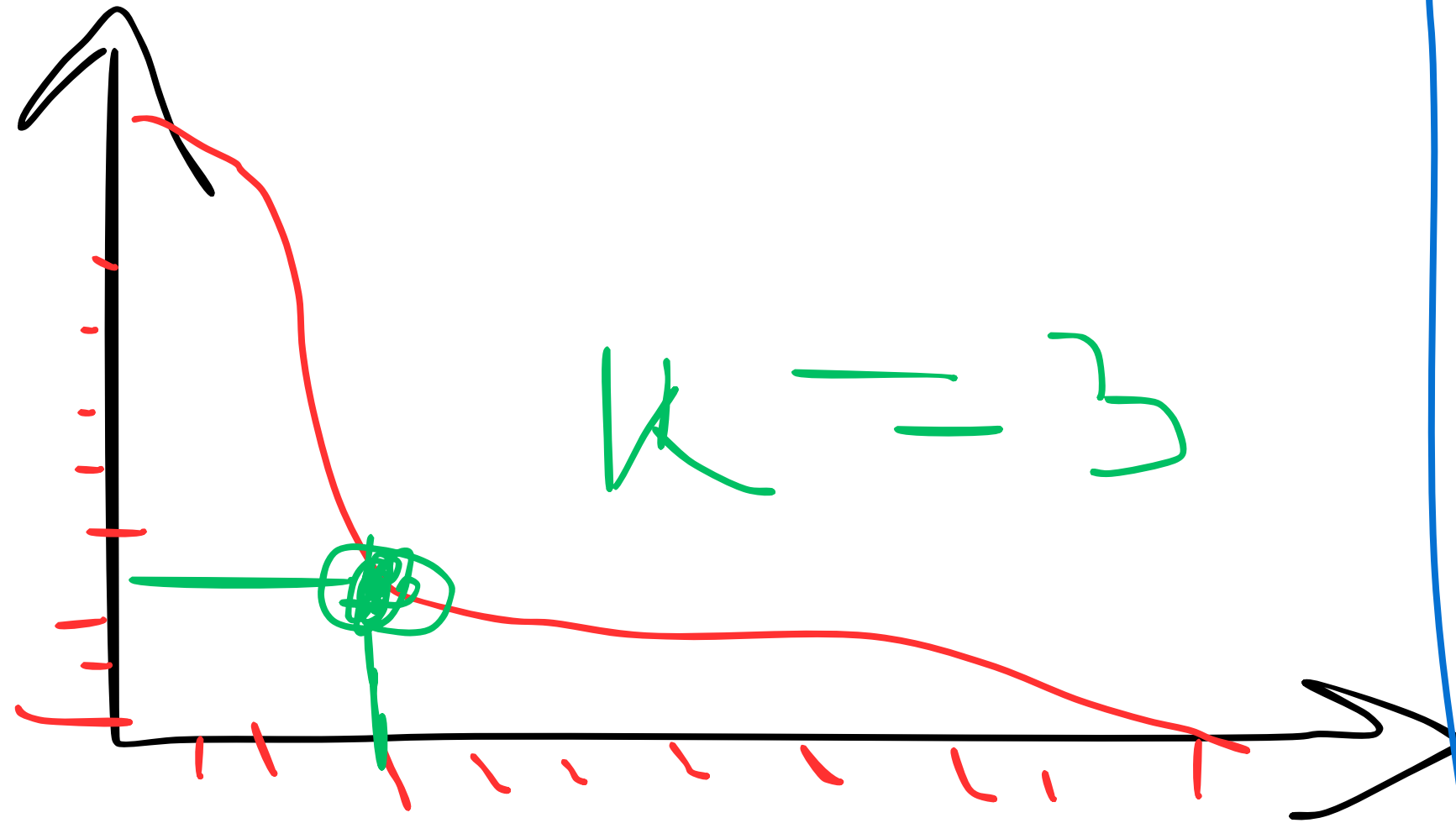
$X_i = \text{input}$

$C = \text{cluster}$

$\Delta = \text{cost}$

Qanday clusterlar sonini tanlaydi

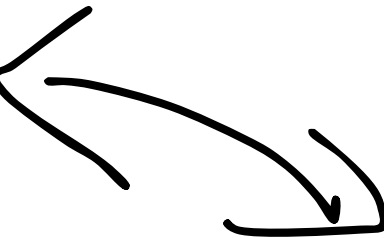
ELBOW



SOXAGA

$k=2$
 $k=3$
 $k=5$

Server



DBMS

← database

← web

← excel

BigData \Rightarrow DataBoze \Rightarrow

SQL \Rightarrow DBMS \Rightarrow

\Rightarrow Server

SQL - Structured
query language.

Mongo - Unstructured
query language