Date:

Case Study: Predicting Cardiac Risk using KNN with K=3

Train Dataset (5 patients)

ID	Age (yrs)	Cholestrol (mg/dl)	Blood pressure	Risk class
1	25	190	80	Low
2	45	230	90	High
3	30	200	85	Low
4	80	220	98	High
5	40	210	88	Low

Test Data:

Features = (Age = 38, Chol = 215, BP = 92)

K = 3

Step 1: Compute Distances to test points

$$d(i) = \sqrt{(Age_i - 38)^2 + (chol_i - 215)^2 + (BP_i - 92)^2}$$

ID	Calculation	Distance	Risk
2	$\sqrt{(45-38)^2 + (230-215)^2 + (90-92)^2} = \sqrt{278}$	16.67	High
1	$\sqrt{(25-38)^2 + (190-215)^2 + (80-92)^2} = \sqrt{938}$	30.63	Low
3	$\sqrt{(30-38)^2 + (200-215)^2 + (85-92)^2} = \sqrt{338}$	18.39	Low
4	$\sqrt{(80-38)^2 + (220-215)^2 + (98-92)^2} = \sqrt{1778}$	13.34	High
5	$\sqrt{(40-38)^2 + (210-215)^2 + (88-92)^2} = \sqrt{45}$	6.71	Low

Date:

Step 2 Pick 3 Nearest Neighbors
Sort by Distance

1	ID5 →	6.71	Low
2	ID4 →	13.34	High
3	ID2 →	16.67	High
4	ID3 →	18.39	Low
5	ID1 →	30.63	Low

K = 3

Step 3 Majority Vote

Neighbour classes = [Low, High, High]

Predicteected = High.