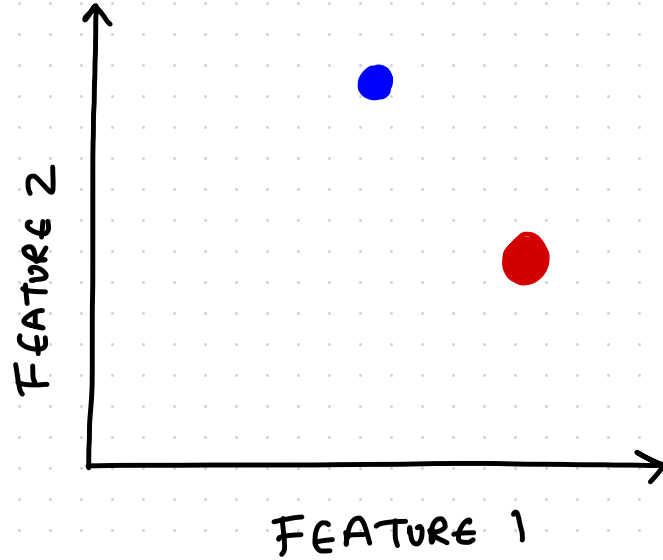
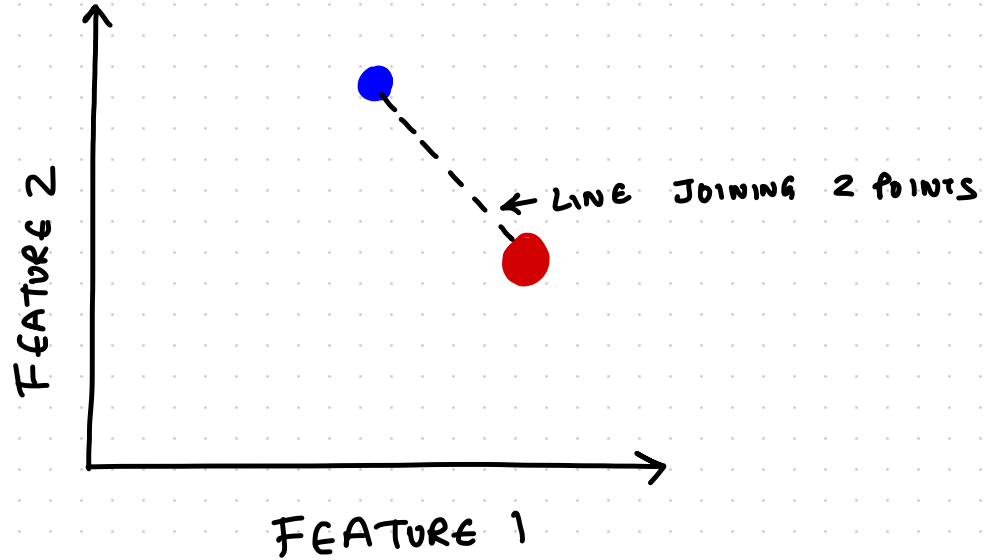


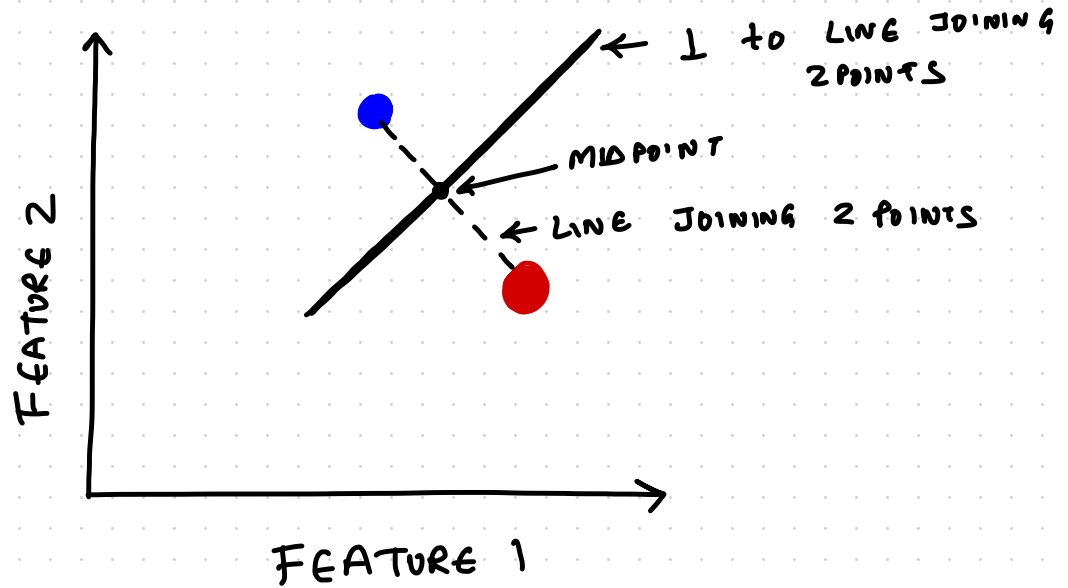
VORONOI DIAGRAM FOR 1-NN



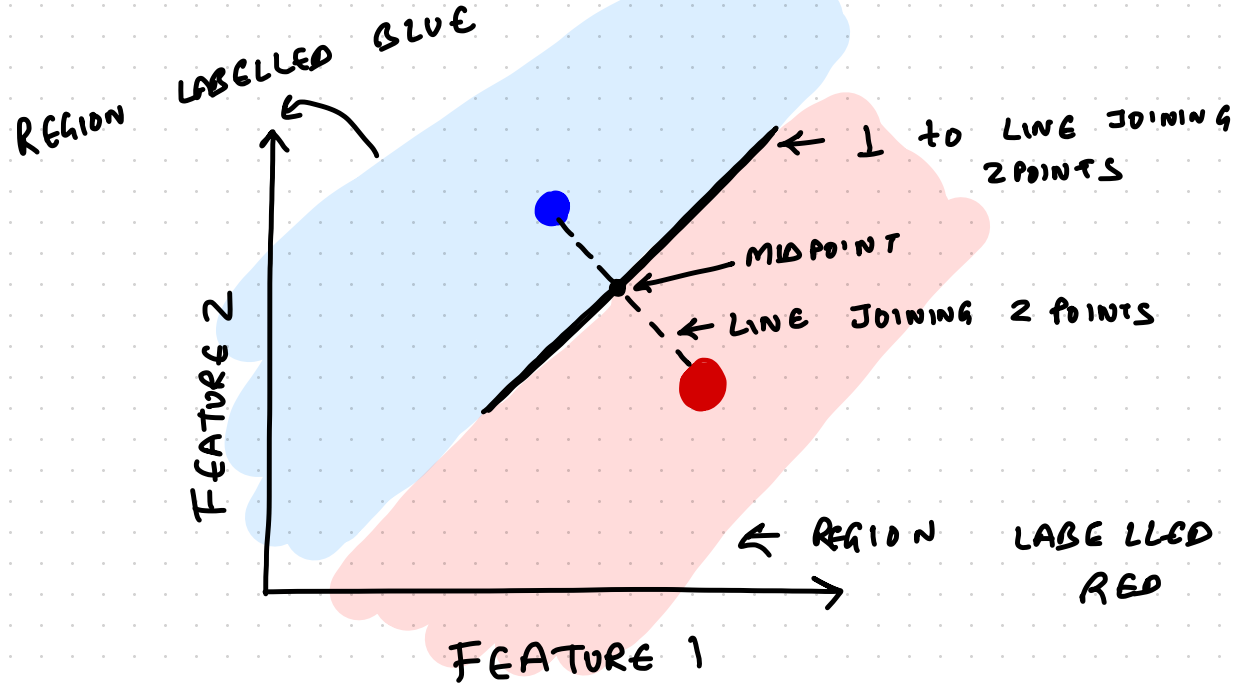
VORONOI DIAGRAM FOR 1-NN



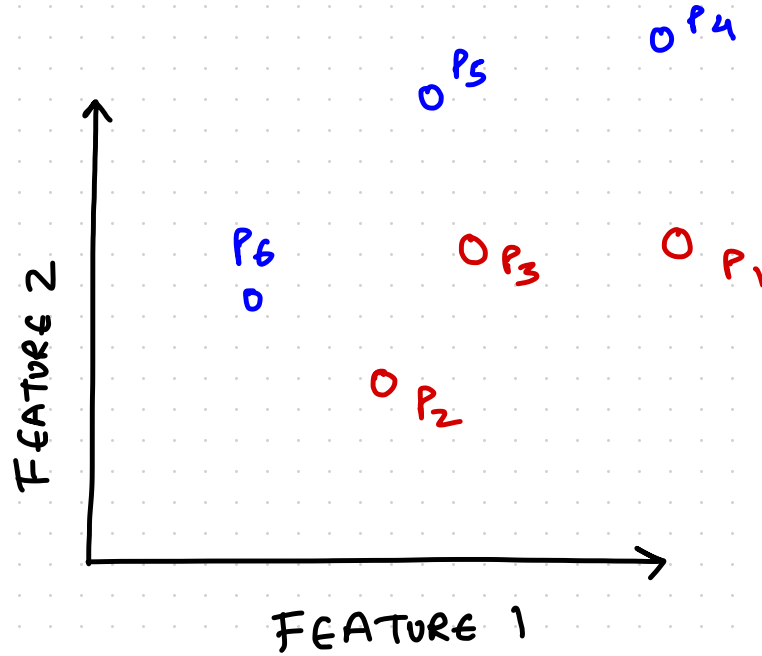
VORONOI DIAGRAM FOR 1-NN



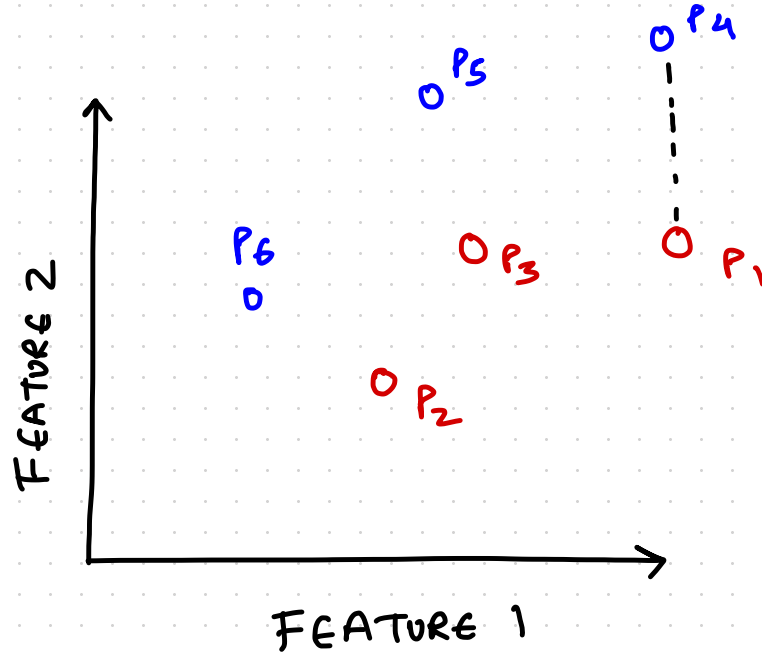
VORONOI DIAGRAM FOR 1-NN



VORONOI DIAGRAM FOR 1-NN

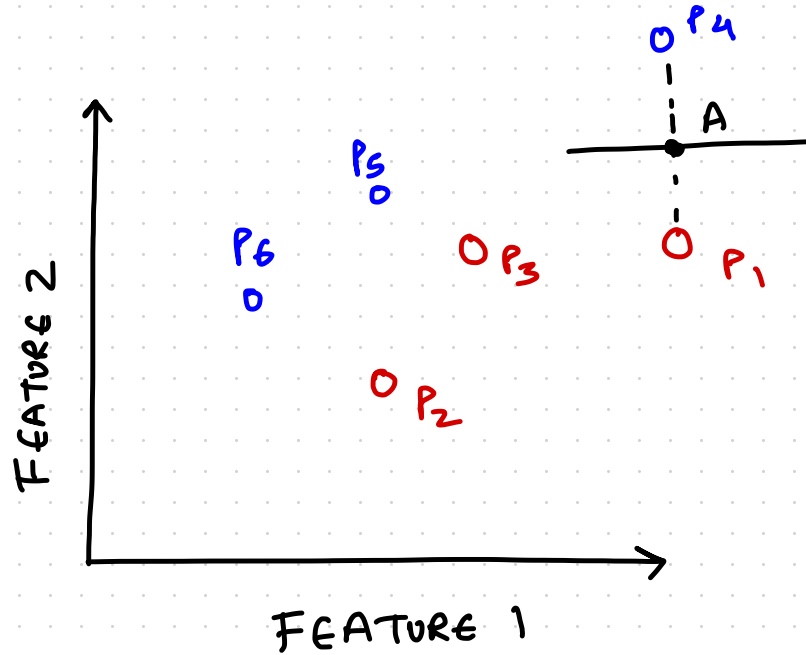


VORONOI DIAGRAM FOR 1-NN



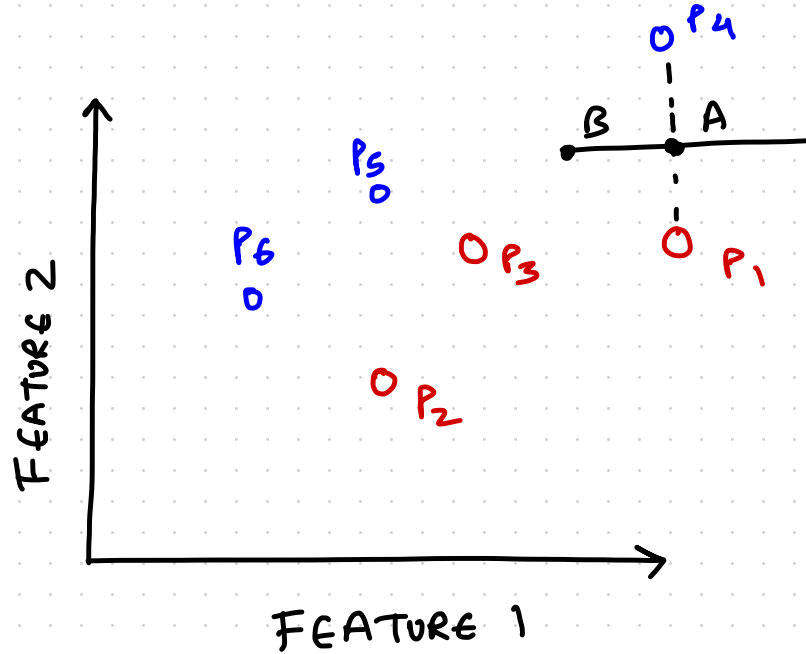
VORONOI DIAGRAM FOR 1-NN

A: MID PT B/W P_1 & P_4



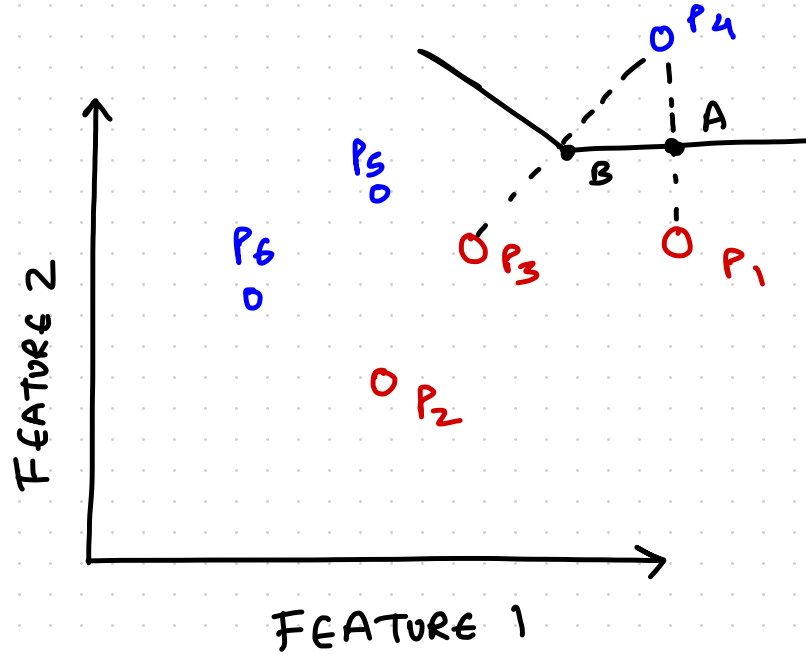
VORONOI DIAGRAM FOR 1-NN

A: MID PT B/W P_1 & P_4
B: CLOSER TO P_3 than P_1



VORONOI DIAGRAM FOR 1-NN

A: MID PT B/W P_1 & P_4
B: CLOSER TO P_3 than P_1



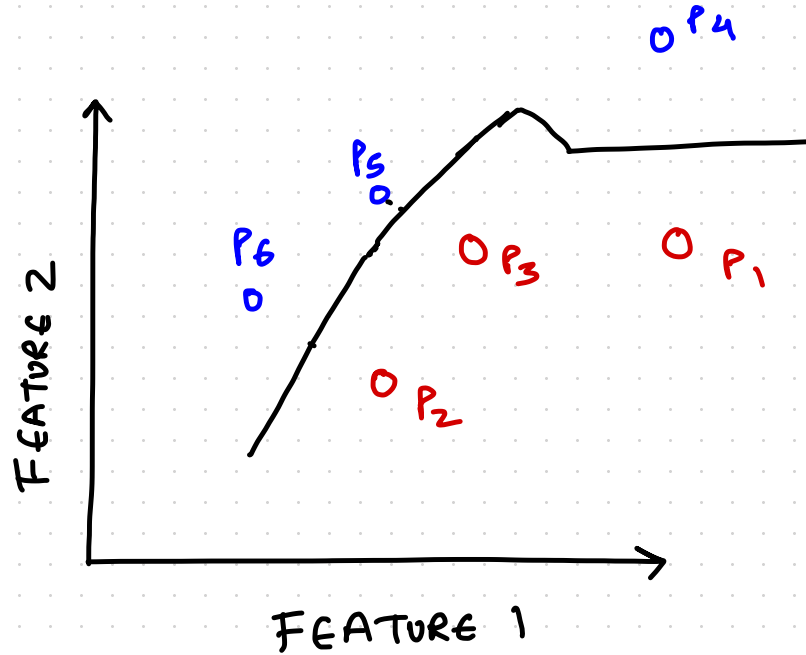
VORONOI

DIAGRAM

FOR

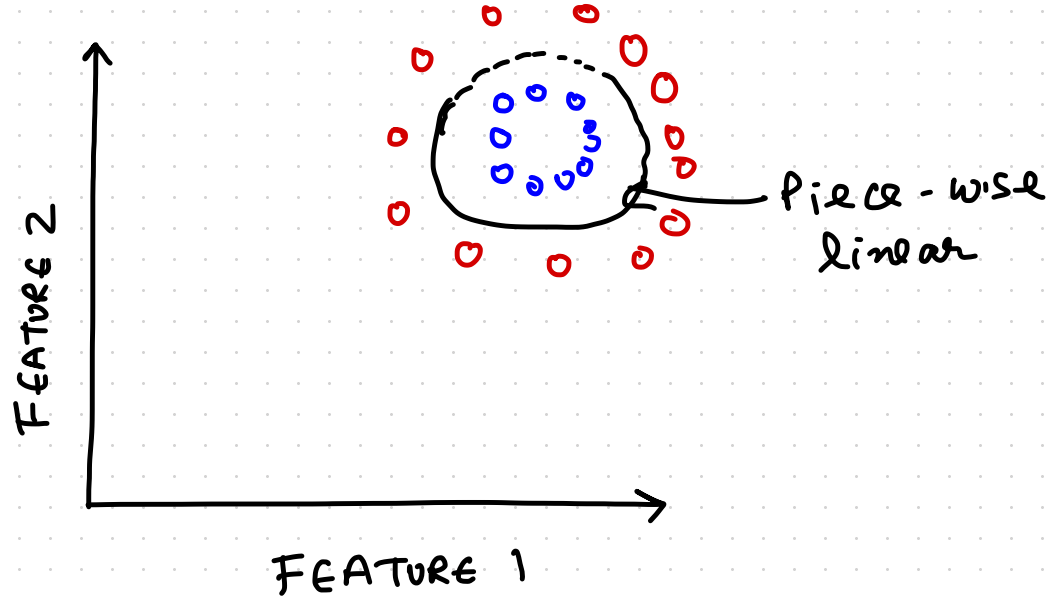
1-NN

DECISION
BOUNDARY IS
PIECE-WISE
LINEAR

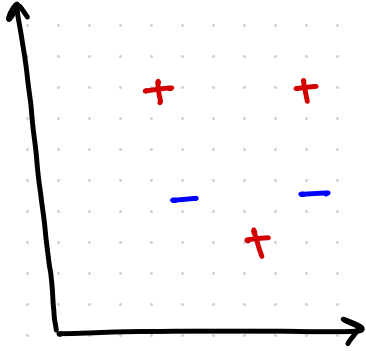


VORONOI DIAGRAM FOR 1-NN

DECISION
BOUNDARY IS
PIECE-WISE
LINEAR

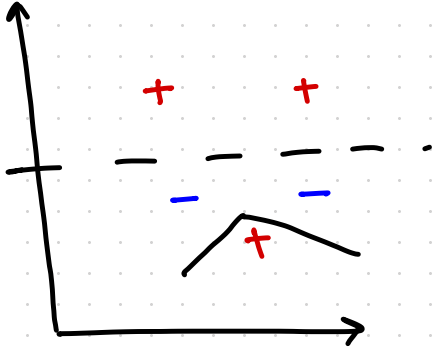


KNN CLASSIFICATION



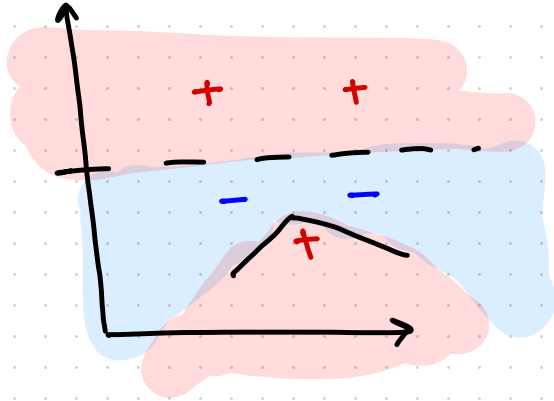
$K=1$ CLASSIFICATION

KNN CLASSIFICATION

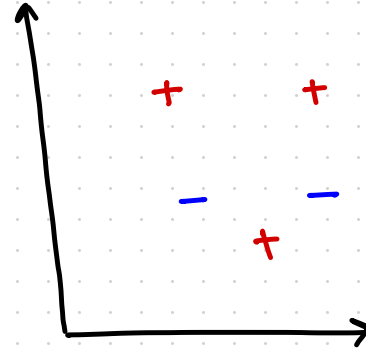


$K=1$ CLASSIFICATION

KNN CLASSIFICATION

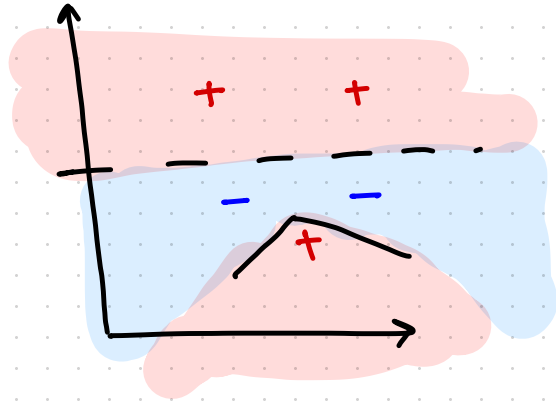


$K=1$ CLASSIFICATION

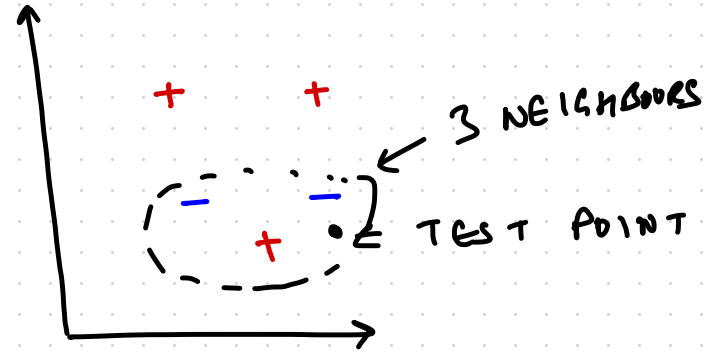


$K=3$ CLASSIFICATION

KNN CLASSIFICATION

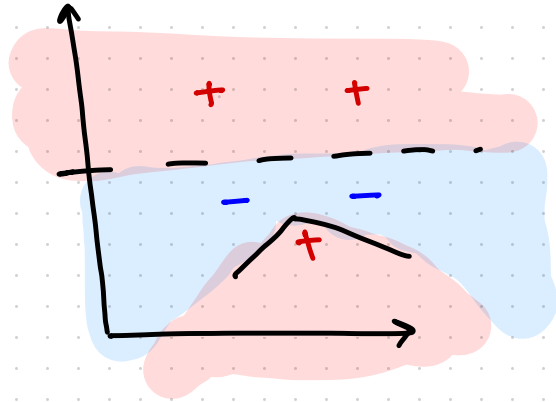


K=1 CLASSIFICATION

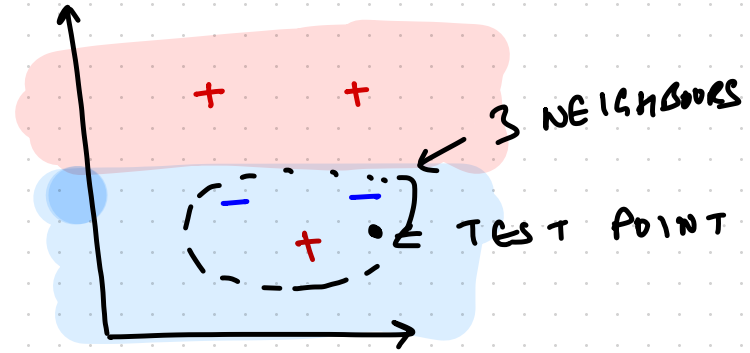


K=3 CLASSIFICATION

KNN CLASSIFICATION

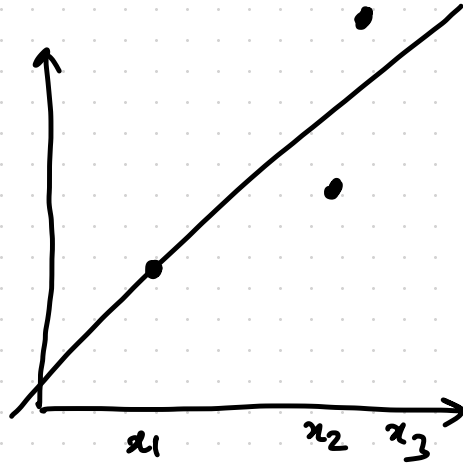


K=1 CLASSIFICATION



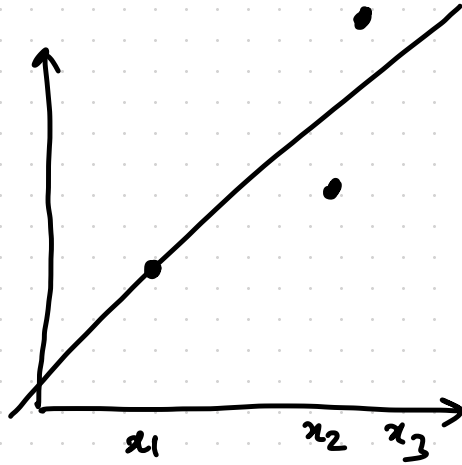
K=3 CLASSIFICATION

LINEAR REGRESSION

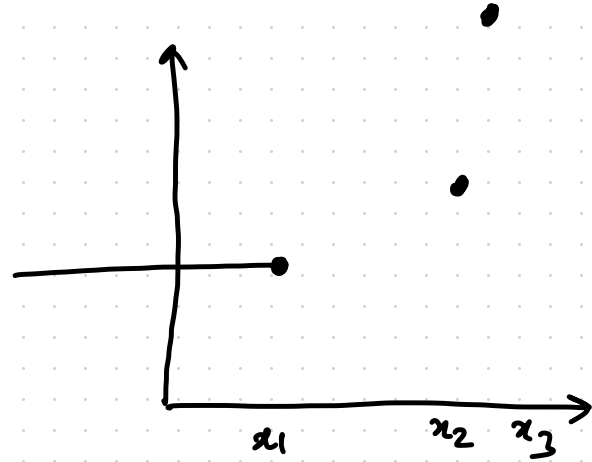


1NN REGRESSION

LINEAR REGRESSION

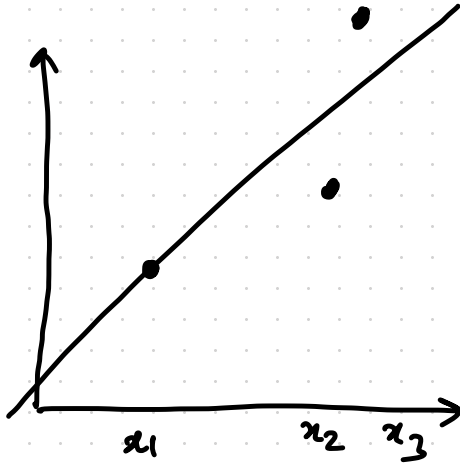


1NN REGRESSION

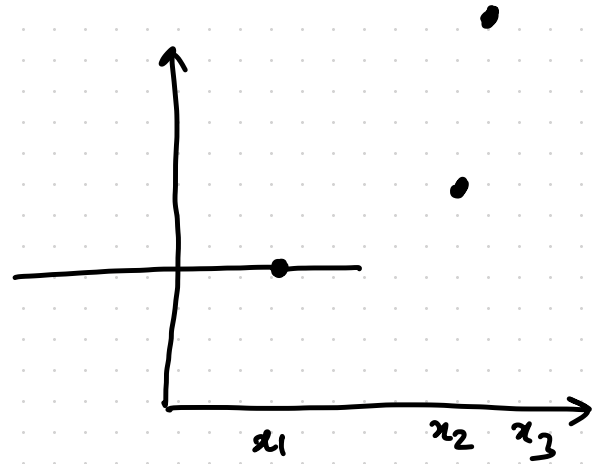


$x < x_1$: NN is (x_1, y_1)

LINEAR REGRESSION

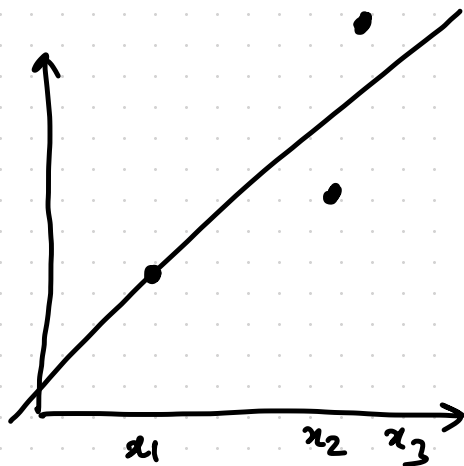


1NN REGRESSION

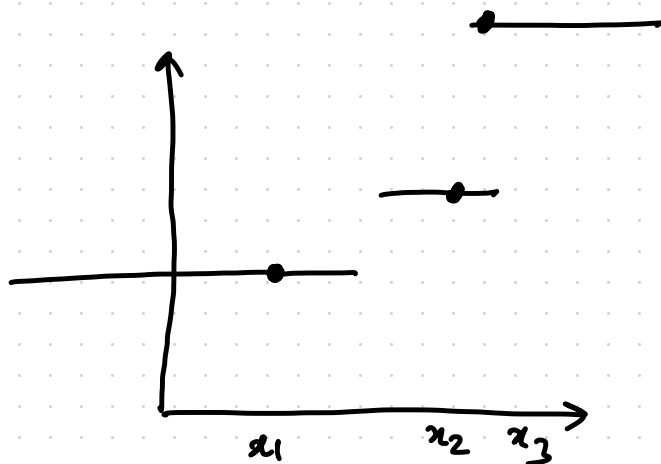


$x < x_1$: NN is (x_1, y_1)
 $x < \frac{x_1 + x_2}{2}$: NN is (x_1, y_1)

LINEAR REGRESSION



1NN REGRESSION

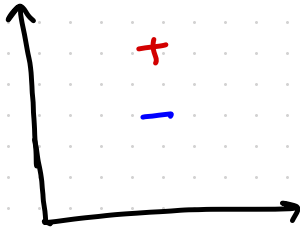


$x < x_1$: NN is (x_1, y_1)

$x < \frac{x_1 + x_2}{2}$: NN is (x_1, y_1)

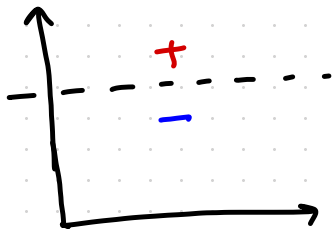
$\frac{x_1 + x_2}{2} < x < \frac{x_2 + x_3}{2}$: NN is (x_2, y_2)

KNN IS NON-PARAMETRIC



LINEAR MODEL

KNN IS NON-PARAMETRIC

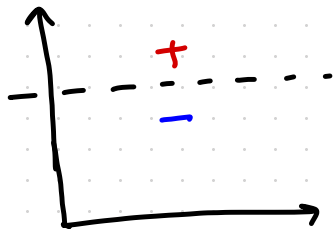


DECISION
BOUNDARY

LINEAR MODEL

$$y = mx + c \quad (\# \text{ params} = 2)$$

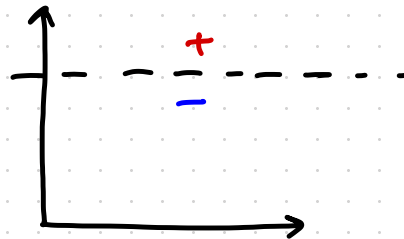
KNN IS NON-PARAMETRIC



LINEAR MODEL

$$y = mx + c \quad (\# \text{ params} = 2)$$

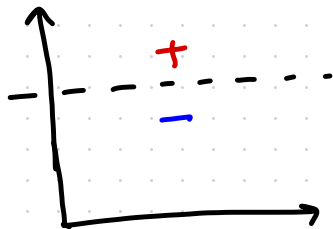
DECISION
BOUNDARY



KNN (K=1)

DECISION
BOUNDARY (LIKE $y = mx + c$)

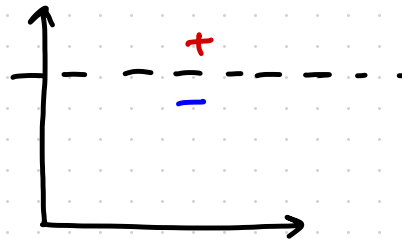
KNN IS NON-PARAMETRIC



LINEAR MODEL

$$y = mx + c \quad (\# \text{ params} = 2)$$

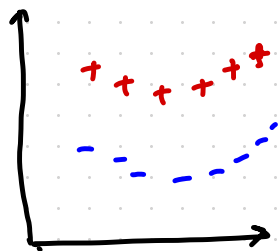
DECISION
BOUNDARY



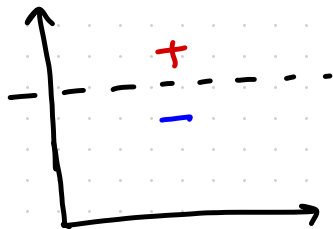
KNN ($k=1$)

DECISION
BOUNDARY (LIKE $y = mx + c$)

ADD DATA



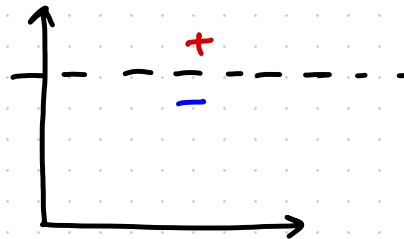
KNN IS NON-PARAMETRIC



LINEAR MODEL

DECISION
BOUNDARY

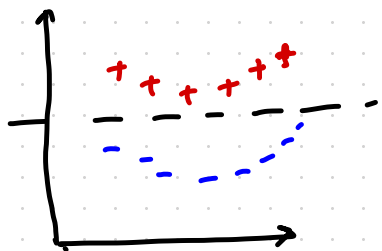
$$y = mx + c \quad (\# \text{ params} = 2)$$



KNN (K=1)

DECISION
BOUNDARY (LIKE $y = mx + c$)

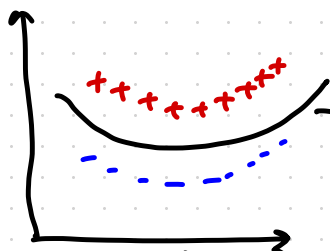
ADD DATA



LINEAR MODEL

DECISION
BOUNDARY

$$y = mx + c \quad (2 \text{ params})$$



KNN (K=1)

PARAMS $\gg 2$ (AT LEAST 1000!)

PARAMETRIC

PARAMS FIXED
WRT DATASET SIZE

MAKE ASSUMPTIONS
(LIKE FUNCTIONAL FORM)

USUALLY QUICKER

Eg: LINEAR MODELS,
SVM (LINEAR, POLYNOMIAL)

NON-PARAMETRIC

PARAMS GROWS
WRT DATASET SIZE

LESSER ASSUMPTIONS

USUALLY SLOWER

Eg: KNN, DT,
SVM (with
RBF)

