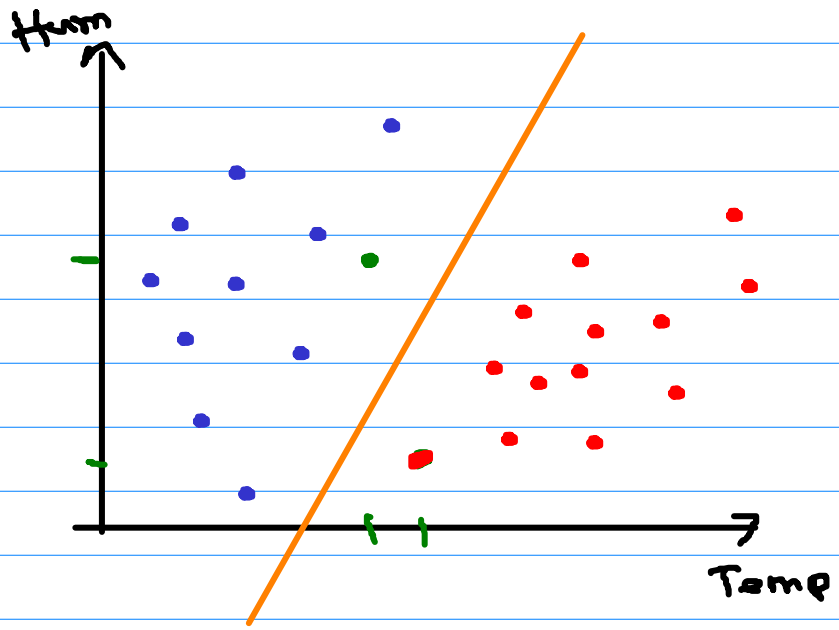


Rain

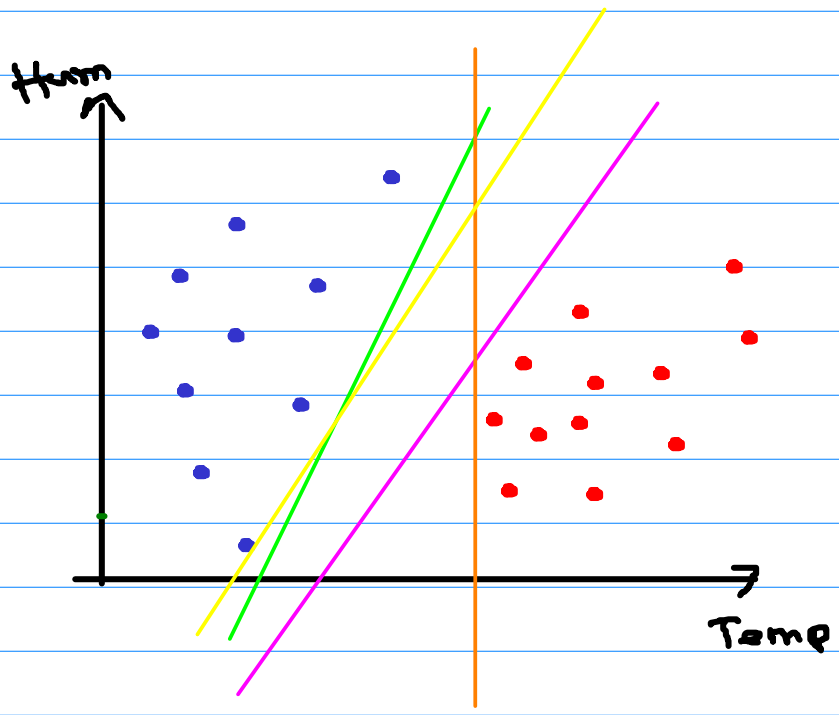
No Rain

Feature, Label

training

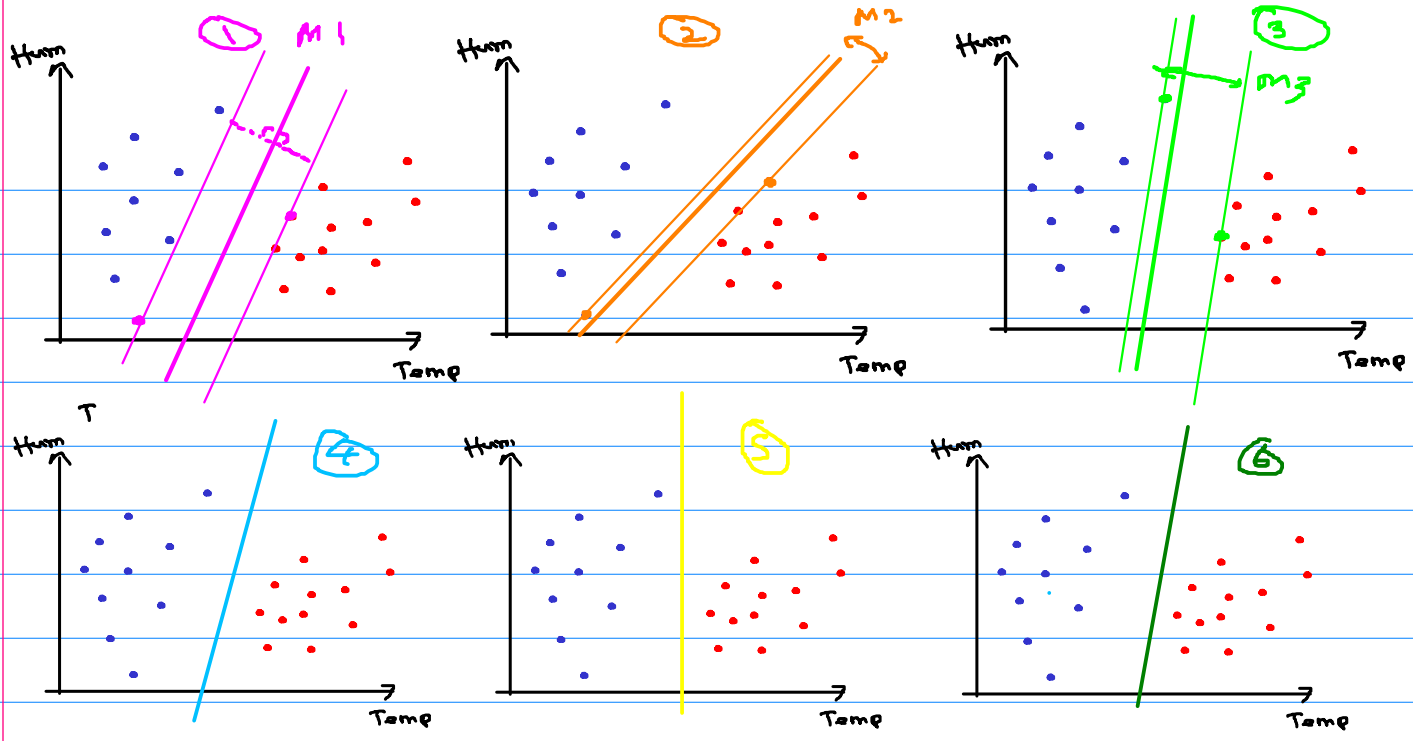
test

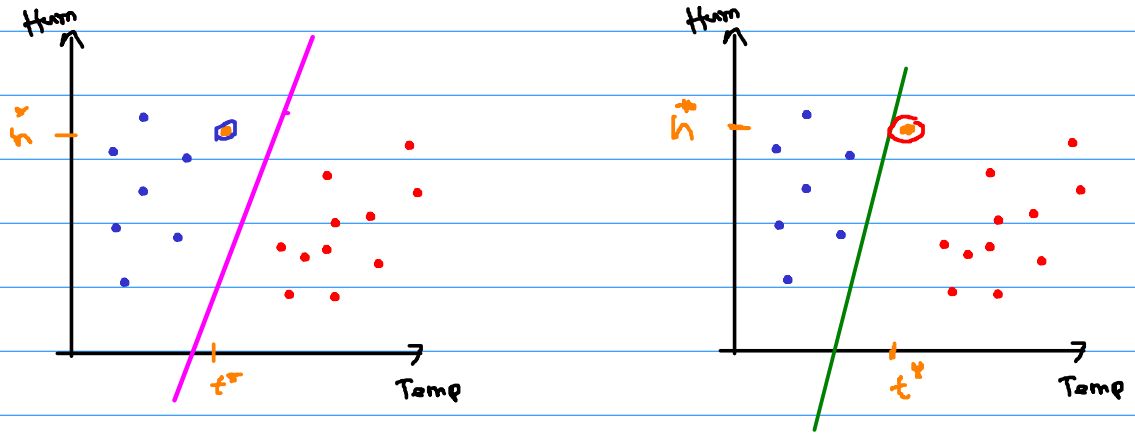
Feature



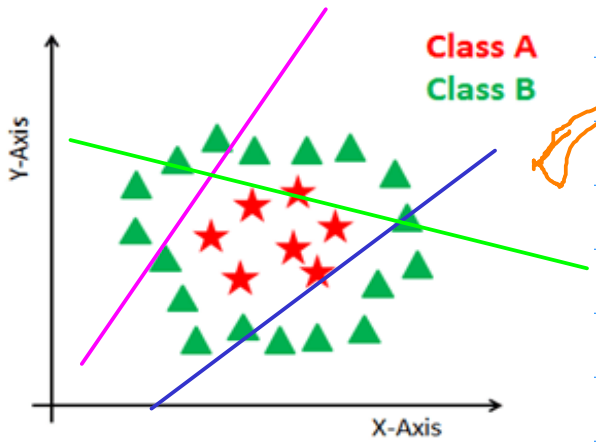
Rain

No Rain

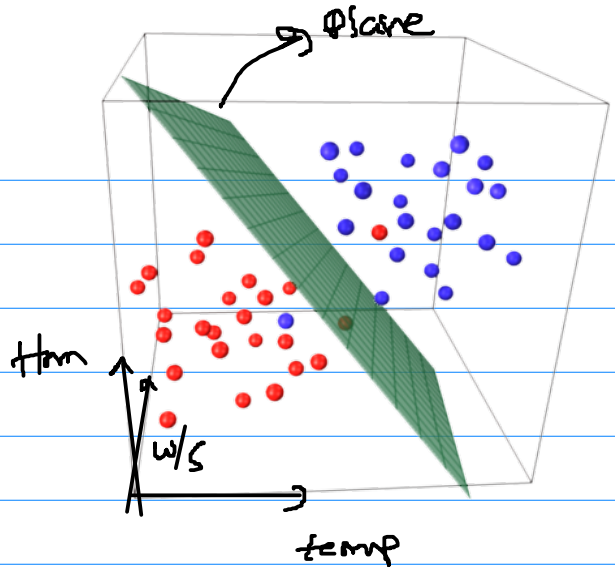




what about this?

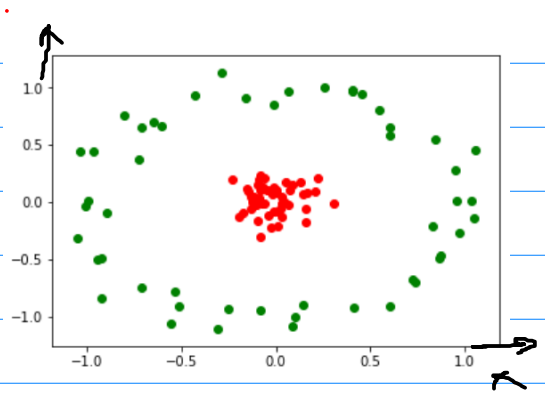


Kernel Trick



Kernel Trick

* The input dimension will be transformed into a higher dimension



Features

(x) F1	(y) F2	target

↓ higher dimension

(x) F1	(y) F2	(z) F3	target

$F_3 = G(F_1, F_2)$

$z = G(x, y)$

ex: $z = x^2 + y^2$

$z = 2x + 3y + 5x^2 + 3y^2 + 6xy$

Kernel Trick

current Dimension ⟶ Higher Dimension

Kernel Trick

Current Dimension ⟶ Higher Dimension

(i) Linear kernel (The standard case)

(ii) polynomial kernel → $z(F_3) = 2x^2 + 3y^2 + 2xy + 5x + 3y$ (example)

(iii) RBF kernel → $z = e^{-(x^2+y^2)}$

(Radial bias function)

(iv) Sigmoid kernel

(v) Tanh kernel