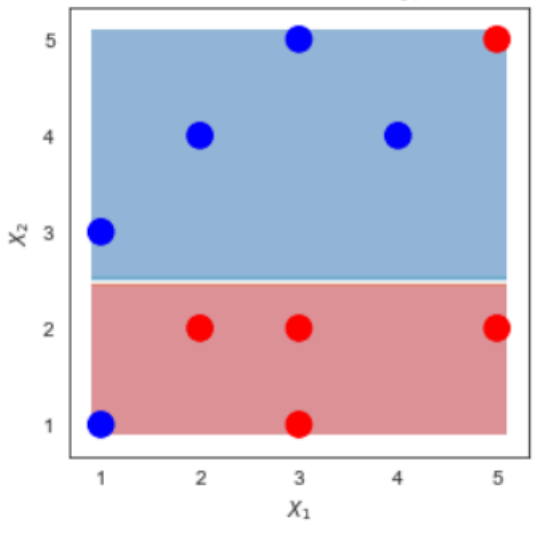
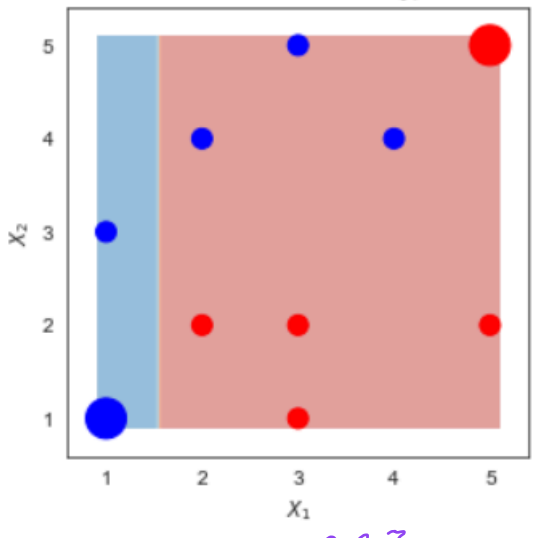
Combining three Stumps

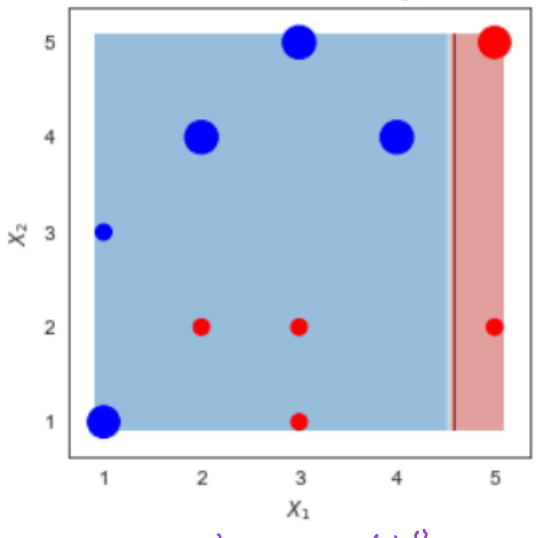
- Let say we stop making new stumps here.
- We will combine the three stumps to make the final model



$\alpha_1 = .693$



$\alpha_2 = .733$



$\alpha_3 = 1.018$

$$\text{Ada boost} = \text{sign}\left[\alpha_1 \cdot \text{Stump 1} + \alpha_2 \cdot \text{Stump 2} + \alpha_3 \cdot \text{Stump 3}\right]$$

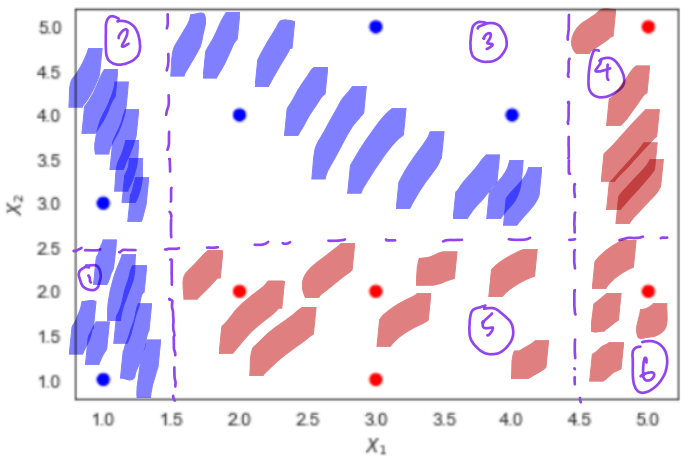
$$H = \text{sign}\left[\alpha_1 \cdot \text{Stump } 1 + \alpha_2 \cdot \text{Stump } 2 + \alpha_3 \cdot \text{Stump } 3\right]$$

$$= \text{sign}\left[.693 \cdot I(X_2 > 2.5) + .733 \cdot I(X_1 < 1.5) + 1.018\ I(X_1 < 4.5)\right]$$

(*) Region (1) : $H = \text{sign}\left[.693 \cdot (-1) + .733 \cdot (1) + 1.018 \cdot (1)\right]$

$= \text{sign}\left[1.058\right] = 1 \quad (\text{b/c } 1.058 > 0)$

Region (2) $H = \text{sign}\left[.693 * 1 + .733 * 1 + 1.018 * 1\right] = 1$



Region (3) :

$H = \text{sign}\left[.93 * 1 + .733 * (-1) + 1.018 * 1\right]$

$= \text{sign}\left[.98\right] = 1$

Region (4) : $\text{sign}\left[.693 * 1 + .733(-1) + 1.018 * (-1)\right]$

$= \text{sign}\left[-1.058\right) = -1$

Combining three Stumps