Perceptron

School of Information Studies
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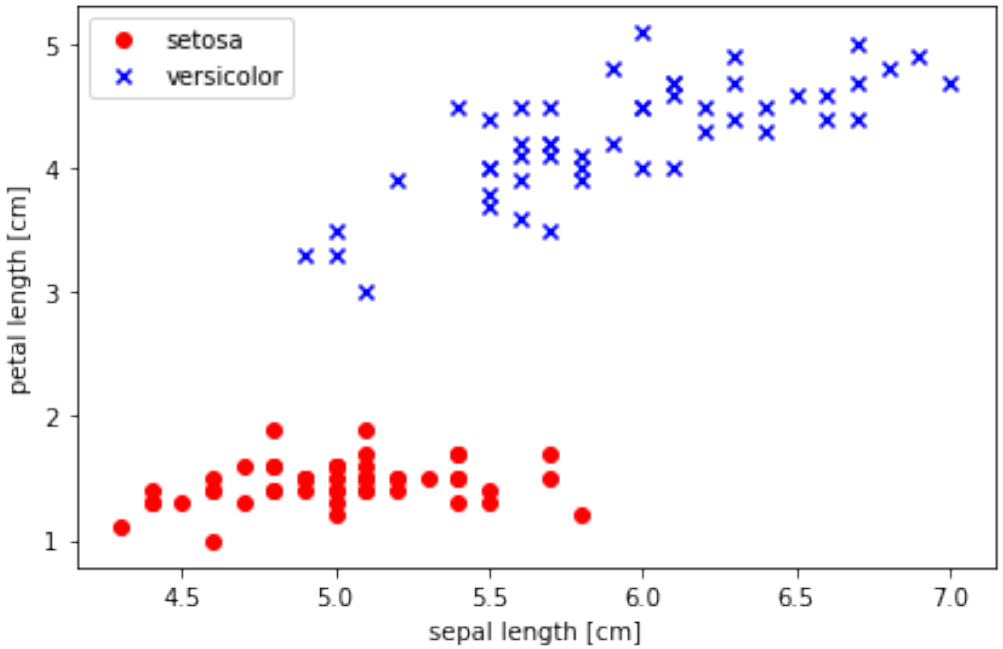
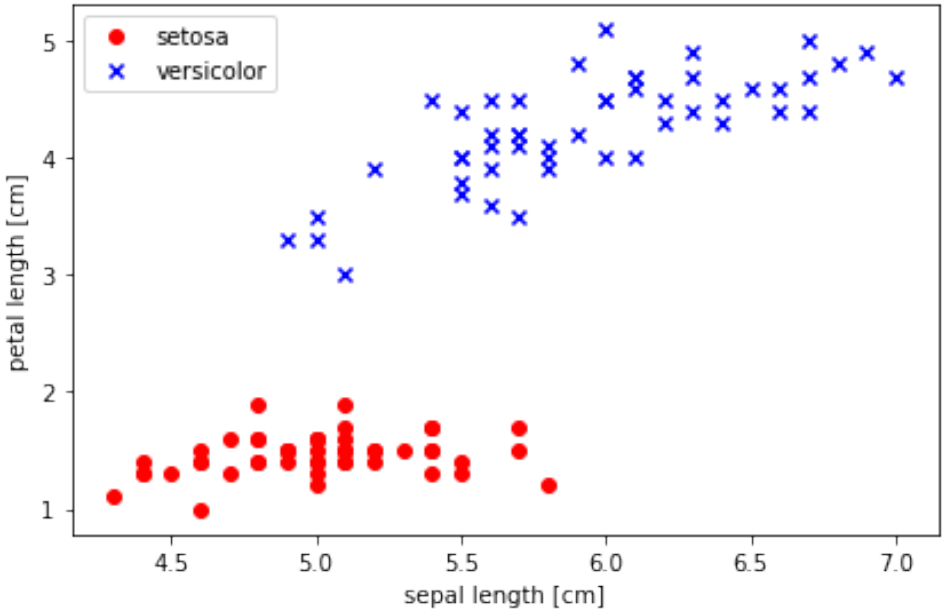
Perceptron Model



Rosenblatt's Model

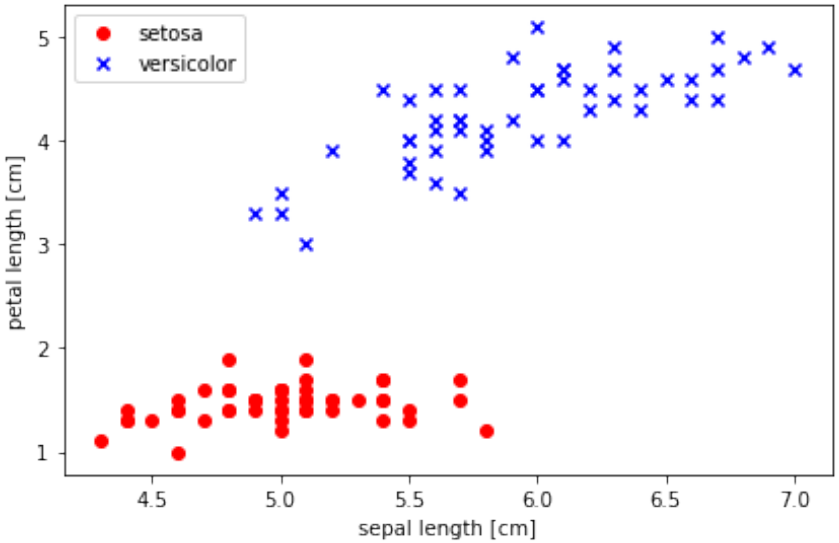
- Initialize the weights
- For each sample:
  - Compute the output
  - Update the weights



Rosenblatt's Model (cont.)

- $\boldsymbol{w} = \begin{bmatrix} w_1 \\ \vdots \\ w_m \end{bmatrix}, \ \boldsymbol{x} = \begin{bmatrix} x_1 \\ \vdots \\ x_m \end{bmatrix}$

- $\varphi(z) = \begin{cases} 1, \text{if } z \geq \theta \\ -1 \text{ otherwise} \end{cases}$



Perceptron Learning Rule

- $\boldsymbol{w} = \begin{bmatrix} w_1 \\ \vdots \\ w_m \end{bmatrix}, \ \boldsymbol{x} = \begin{bmatrix} x_1 \\ \vdots \\ x_m \end{bmatrix}$

$$z = \boldsymbol{w}^T \boldsymbol{x}$$

$$\Delta w_j = \eta\left(y^i - \hat{y}^i\right) x_j^{(i)}$$

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Perceptron Learning Rule (cont.)

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