NPTEL ONLINE CERTIFICATION COURSES

Course Name: Deep Learning

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Topic

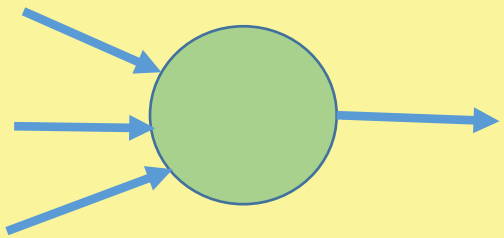
Lecture 21: Multilayer Perceptron

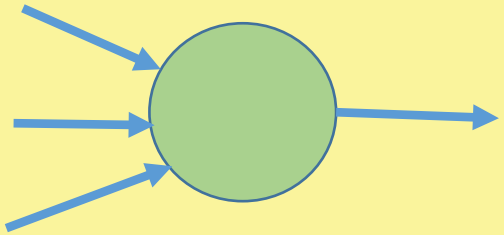
CONCEPTS COVERED

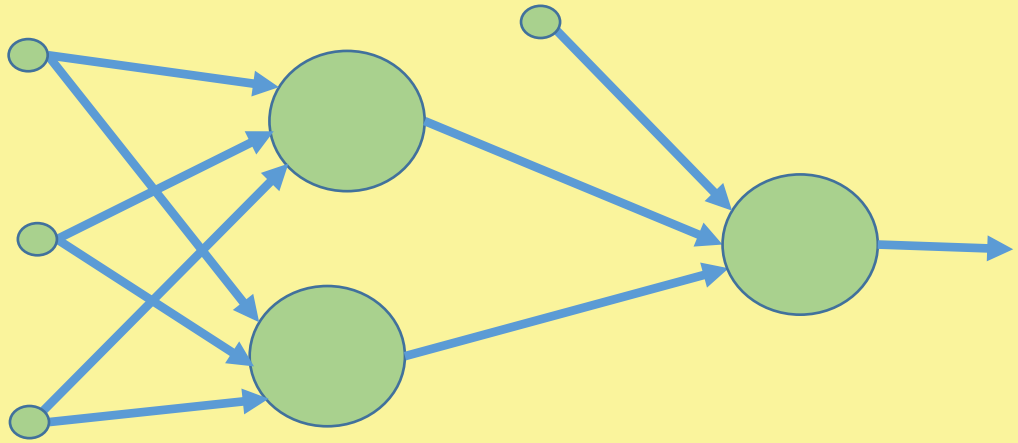
Concepts Covered:

- Neural Network
  - AND Logic
  - OR Logic
  - XOR Logic
- Feed Forward NN
- Back Propagation Learning

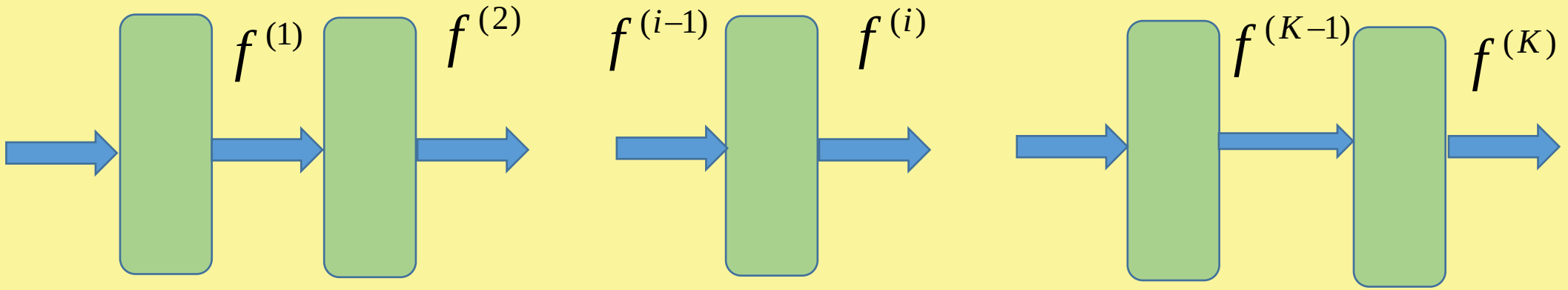
AND/ OR/ XOR





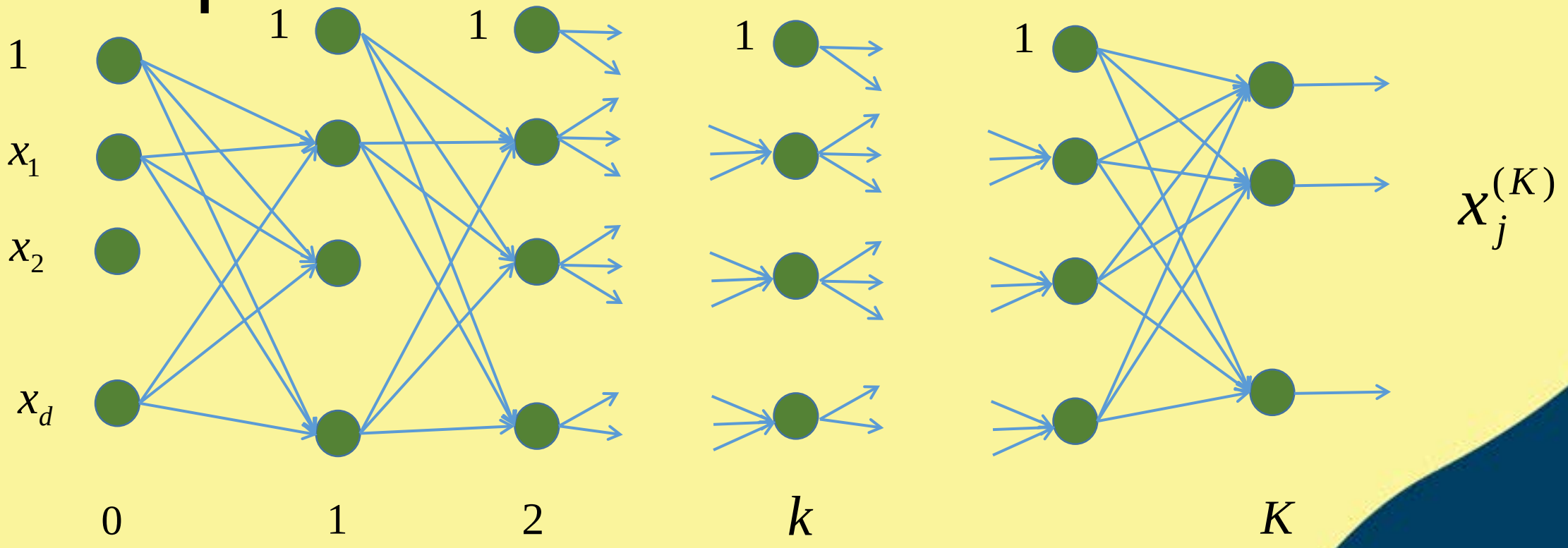


Neural Network Function



$$f^{(K)}(f^{(K-1)}.....(f^{(i)}....(f^{(2)}(f^{(1)}(X)))))$$

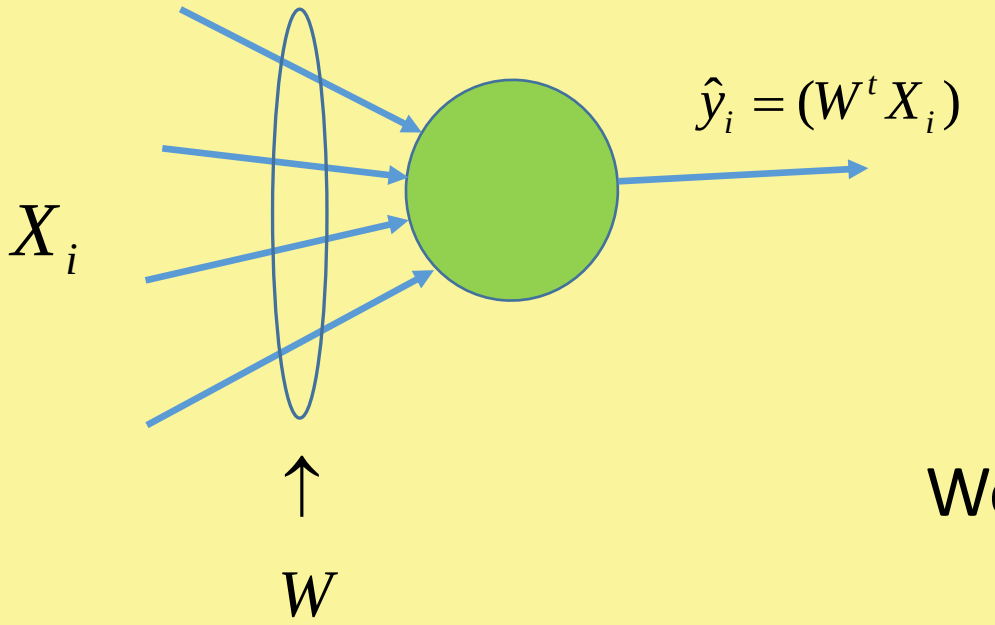
Multilayer Perceptron



$M_k \rightarrow$ No. of nodes in k^{th} layer

Back Propagation Learning

Single Layer Network- Single Output without nonlinearity



$$E = \frac{1}{2}\sum_{i=1}^{N}(W^t X_i - y_i)^2 = \frac{1}{2}\sum_{i=1}^{N}(\hat{y}_i - y_i)^2$$

$$\nabla_W E = \sum_{i=1}^{N}(\hat{y}_i - y_i)X_i$$

Weight updation rule

$$W \leftarrow W - \eta\sum_{i=1}^{N}(\hat{y}_i - y_i)X_i$$

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Thank you