Fundamentals / Foundation of Data Science

Data Science 9CFU

Computer Science 6CFU

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1D Convolution

Apply convolution on this 1-D signal. Use valid padding i.e., do not add anything and stride 1.

- **Input:** [2, 5, 3, 4, 1, 6]
- **Kernel:** [1, 0, -1]

2D Convolution

Compute 2 D convolution with stride 2 and valid padding.

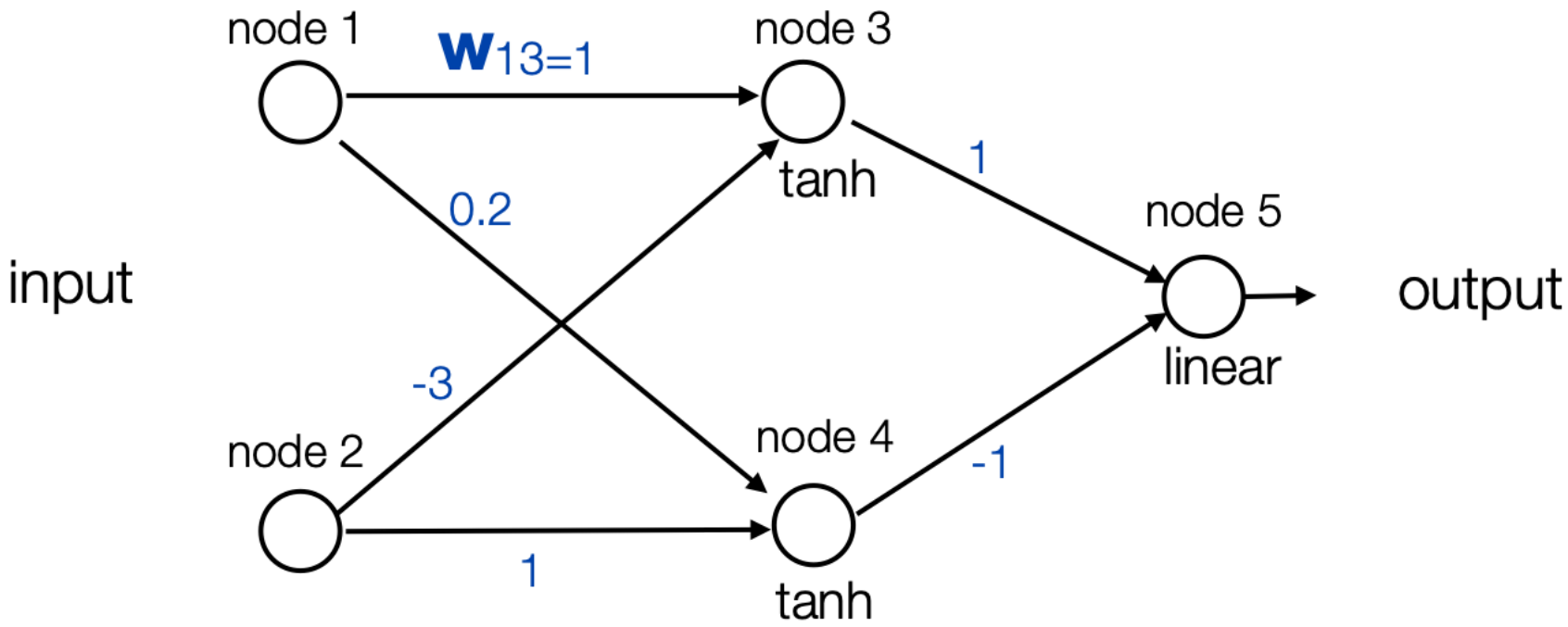
Input Matrix:

$$\begin{matrix} 3 & 1 & 2 & 0 \\ 1 & 0 & 4 & 2 \\ 2 & 1 & 0 & 3 \\ 4 & 2 & 1 & 0 \end{matrix}$$

Kernel:

$$\begin{matrix} 1 & -1 \\ 0 & 2 \end{matrix}$$

Backpropagation example



Learning rate η = -0.2 (because we used positive increments)

Euclidean loss

Training data:	input		desired output
	node 1	node 2	node 5
	1.0	0.1	0.5

Exercise: run one iteration of back propagation