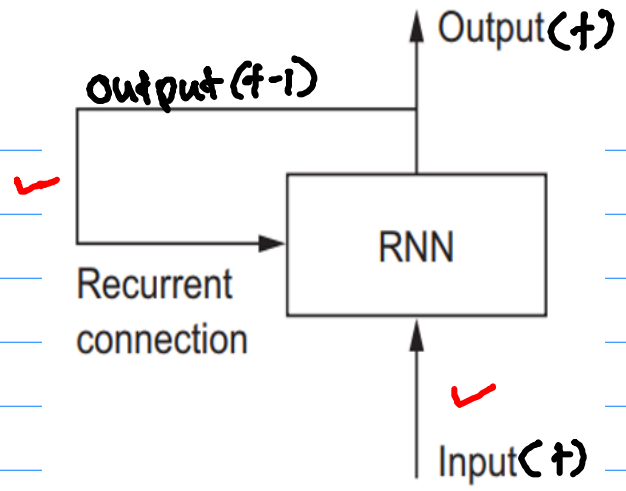
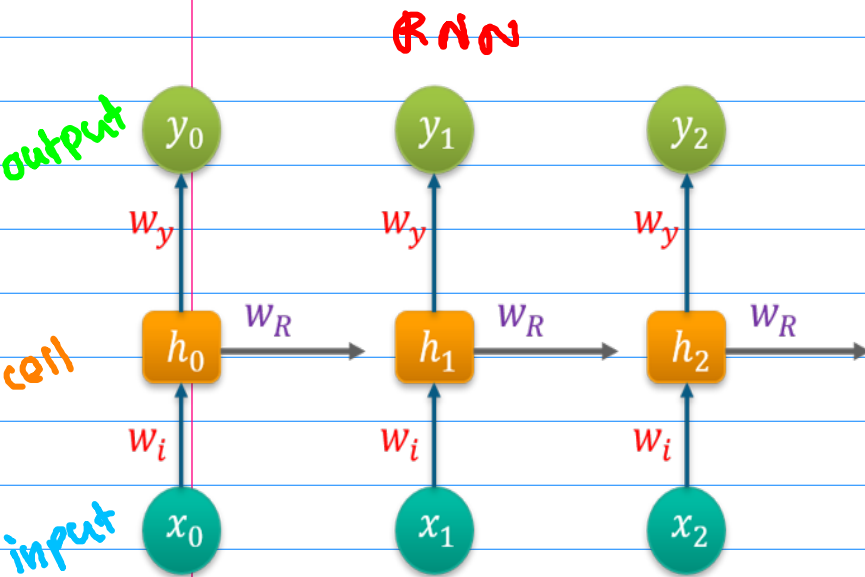
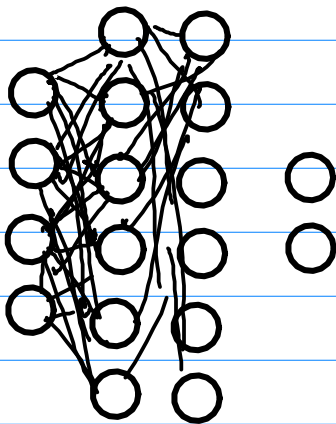


Idea of RNNs

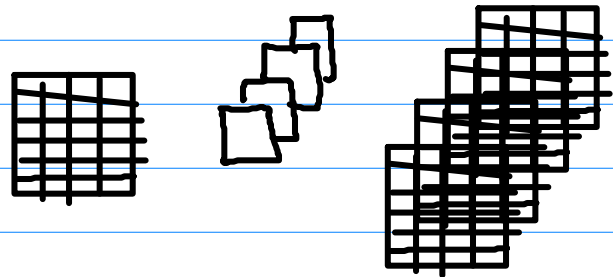


$$h^{(t)} = g_h (w_i x^{(t)} + w_R h^{(t-1)} + b_h)$$

$$y^{(t)} = g_y (w_y h^{(t)} + b_y)$$



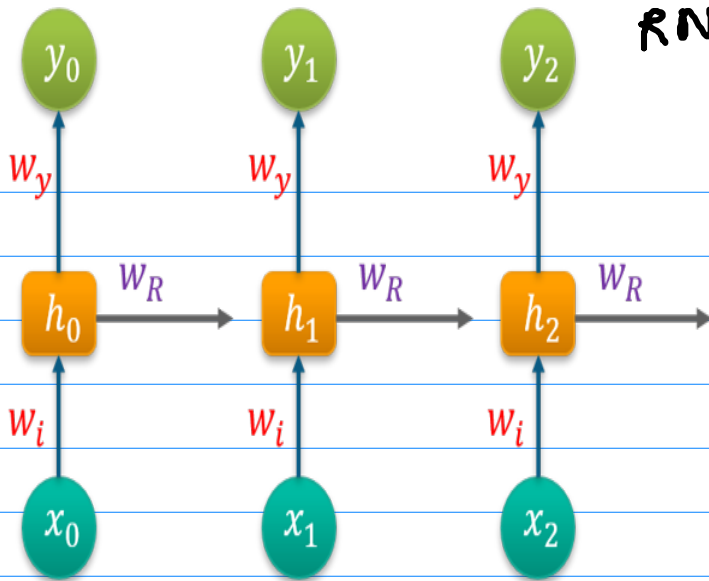
FFNN



CNN

RNN Layer

Output



Cell

Input

$w_i, w_R, w_y \rightarrow$ Weights

$b_h, b_y \rightarrow$ Biases

$g_h, g_y \rightarrow$ Activation Functions

$$h^{(t)} = g_h(w_i x^{(t)} + w_R h^{(t-1)} + b_h)$$

$$y^{(t)} = g_y(w_y h^{(t)} + b_y)$$

$t=0$

$$h_0 = g_h(w_i x_0 + b_h), h_0 \rightarrow x_0$$

$$y_0 = g_y(w_y h_0 + b_y), y_0 \rightarrow h_0 \quad y_0 \rightarrow x_0$$

$t=1$

$$h_1 = g_h(w_i x_1 + w_R h_0 + b_h), h_1 \rightarrow x_1, h_0, h_1 \rightarrow x_1, x_0$$

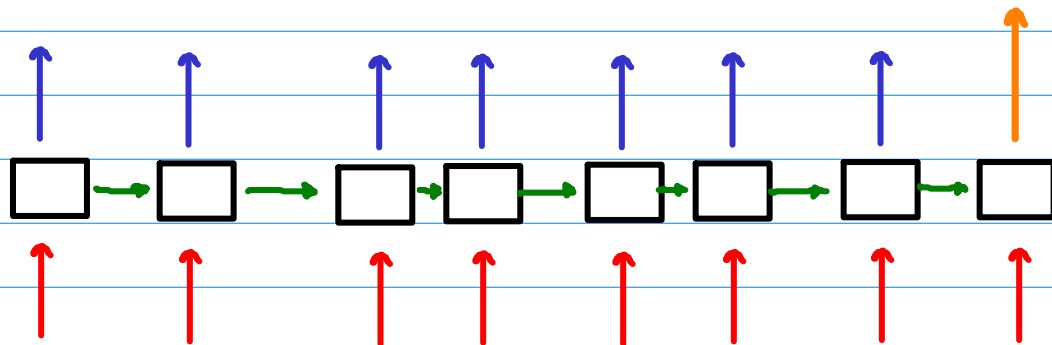
$$y_1 = g_y(w_y h_1 + b_y), y_1 \rightarrow h_1, y_1 \rightarrow x_1, h_0, y_1 \rightarrow x_1, x_0$$

$t=2$

$$h_2 = g_h(w_i x_2 + w_R h_1 + b_h), h_2 \rightarrow x_2, h_1, h_2 \rightarrow x_2, x_1, x_0$$

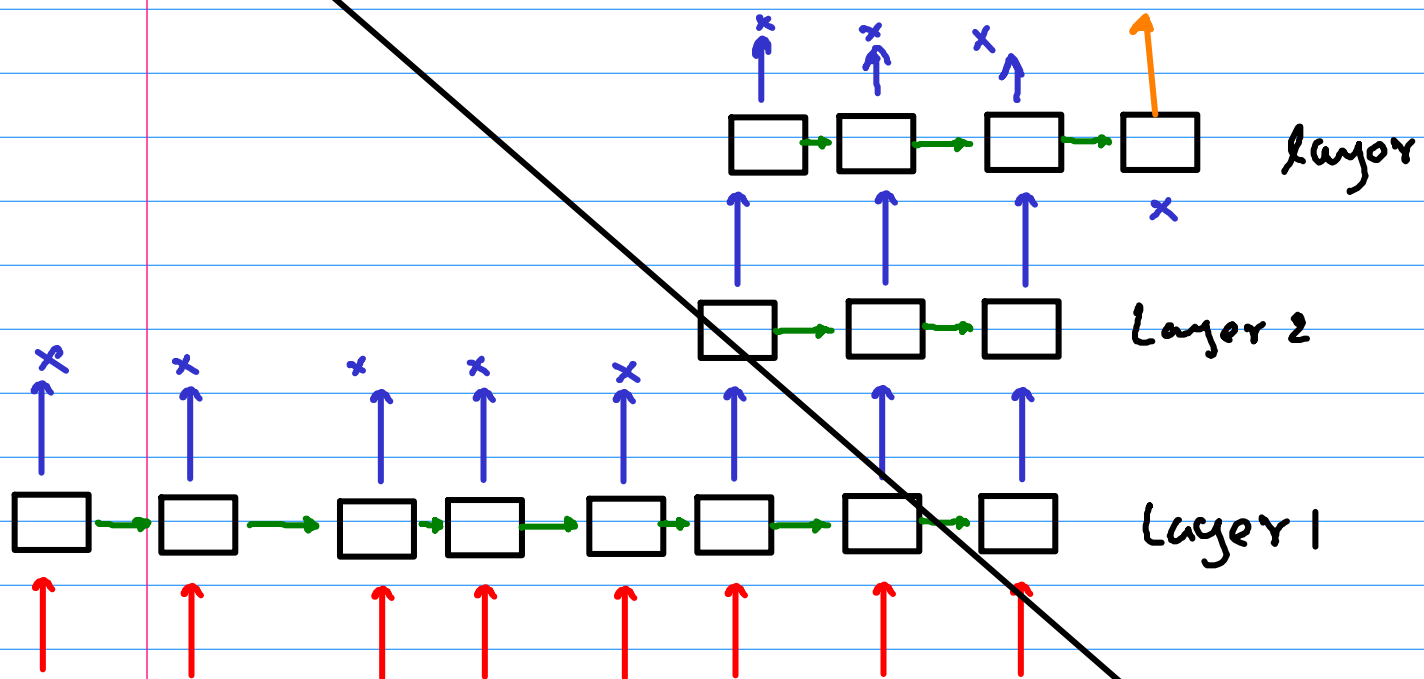
$$y_2 = g_y(w_y h_2 + b_y), y_2 \rightarrow h_2, y_2 \rightarrow x_0, x_1, x_2$$

walk



This morning I took my cat for a

Adding Layers to RNN



I live in ~~Boston~~. I grew up in France, I speak fluent French

data and target in stock value prediction

50

data =



1209



⋮



target =



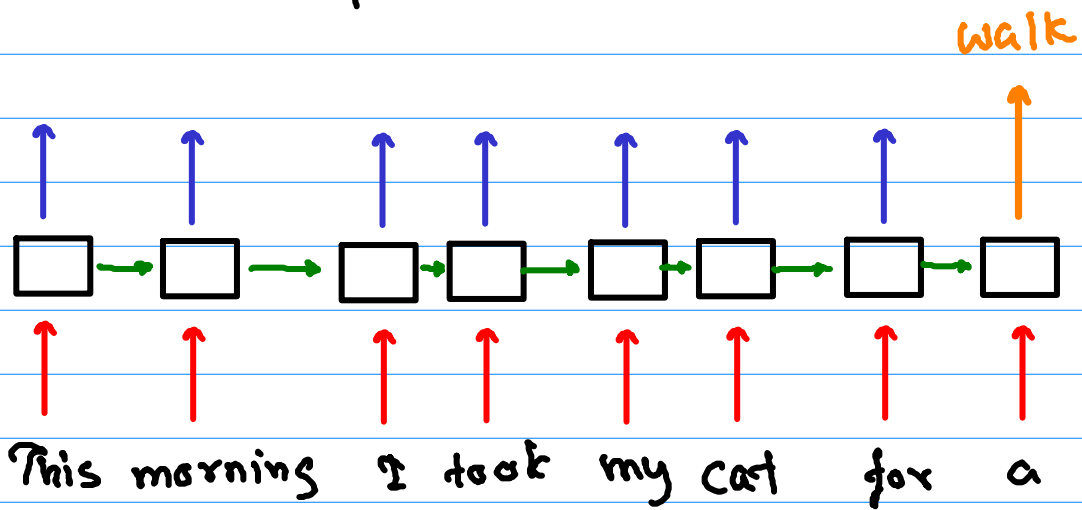
1209

⋮

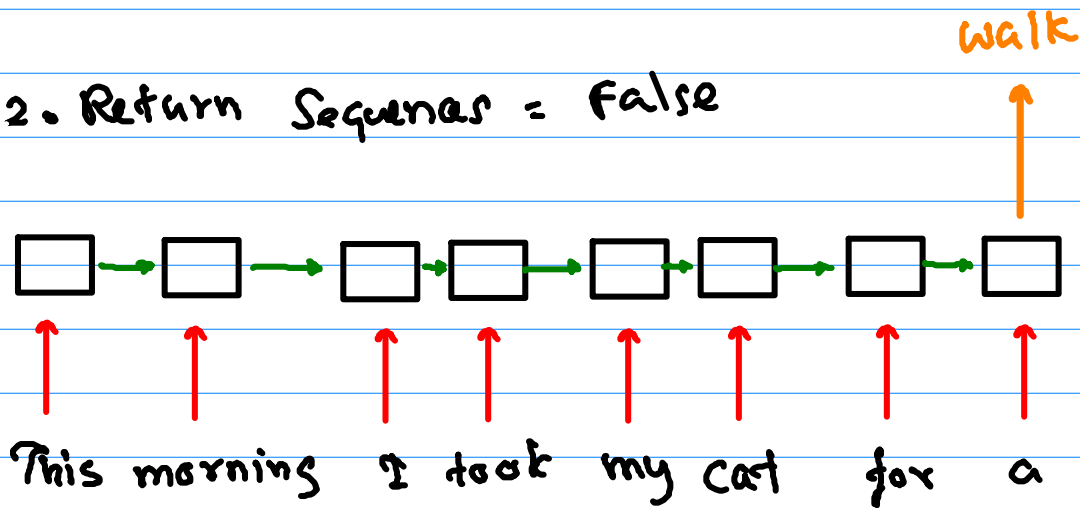
⋮



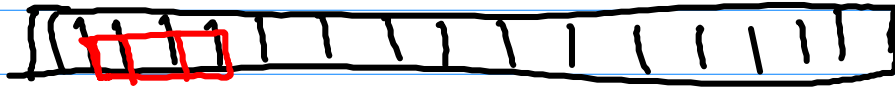
1. Return Sequences = True



2. Return Sequences = False



CNN for time series data \rightarrow conv 1D
pooling 1D



1D kernel \rightarrow  3×1