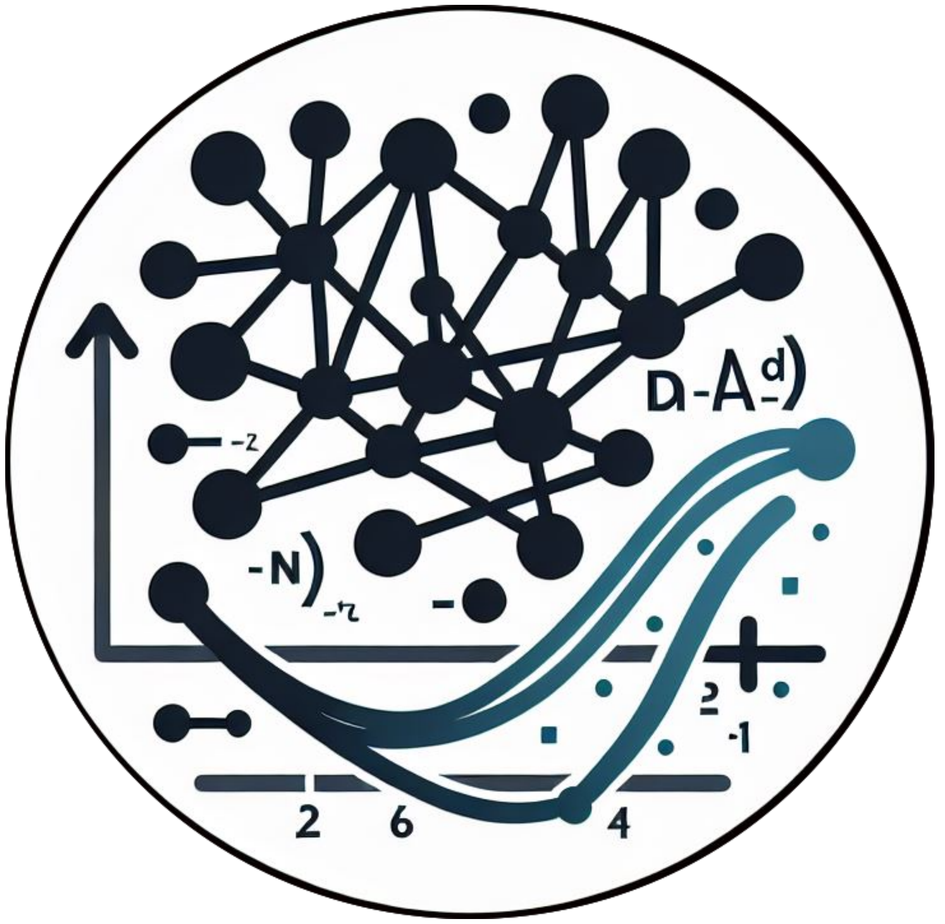
Recurrent Neural Nets - Code Examples



Deep Learning for Engineers
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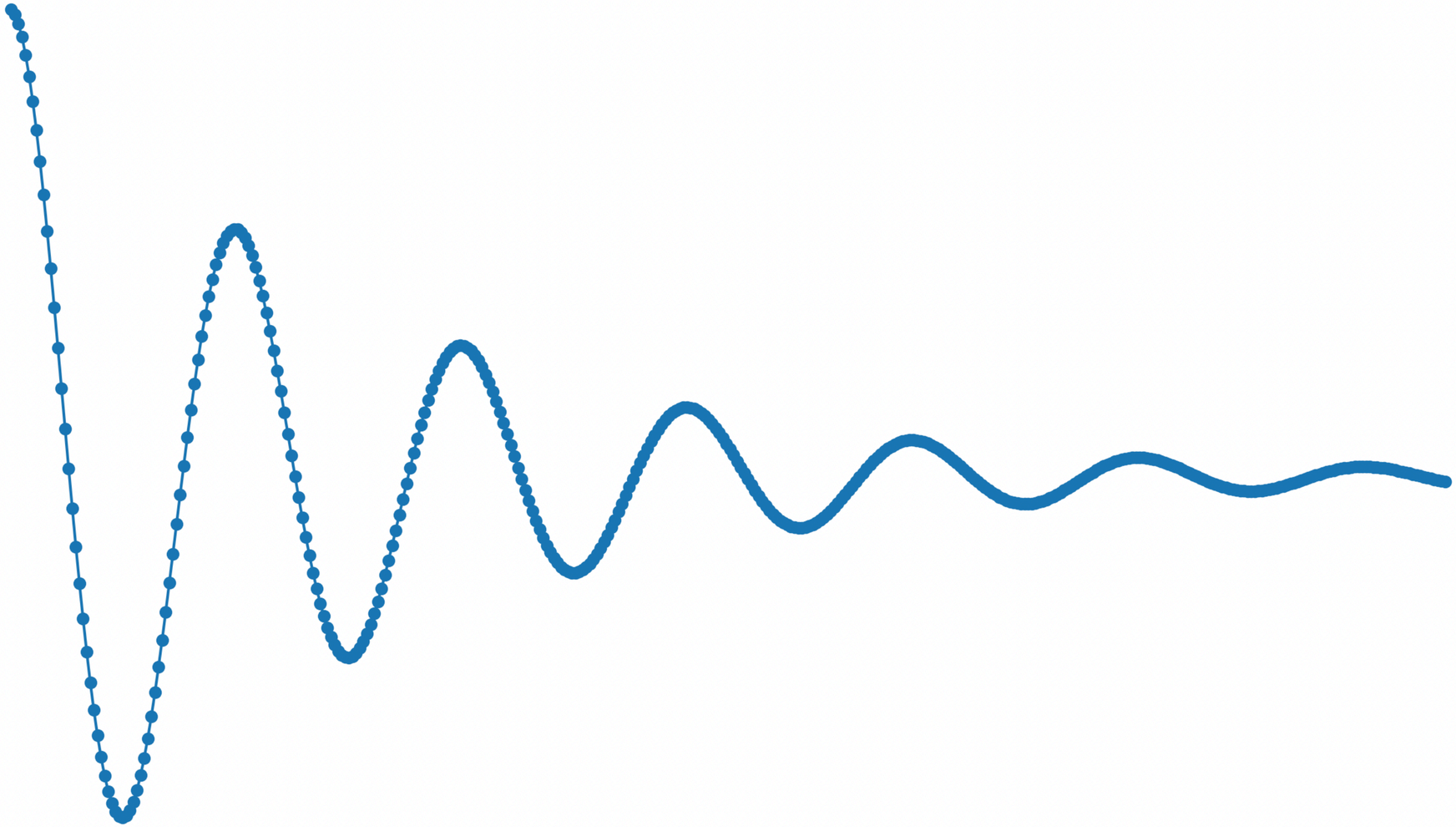
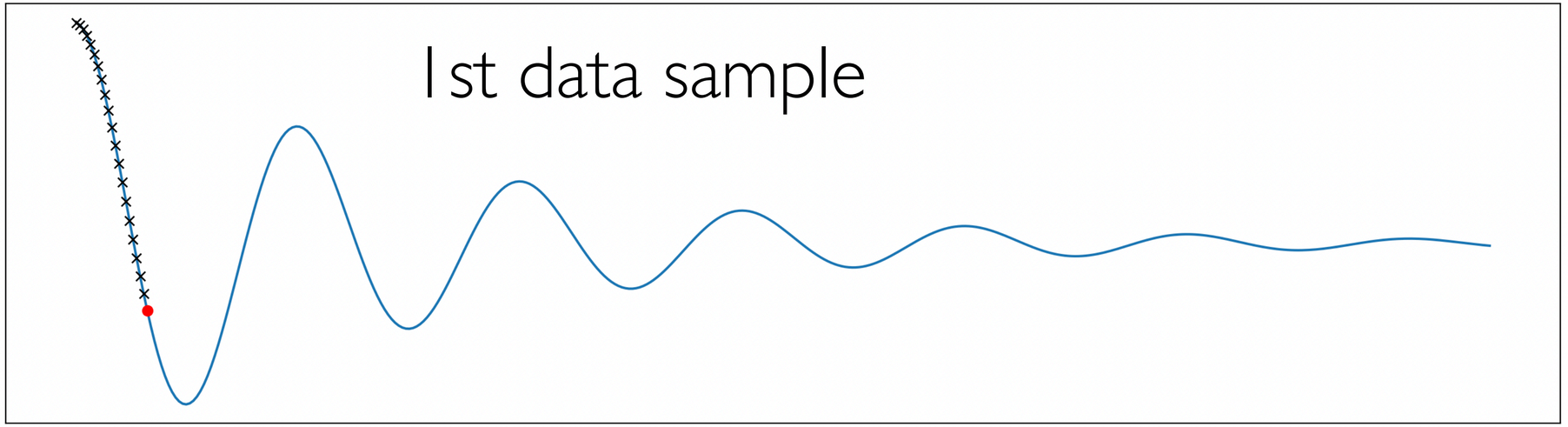
Example 1

A single trajectory (data sequence) of 400 pts

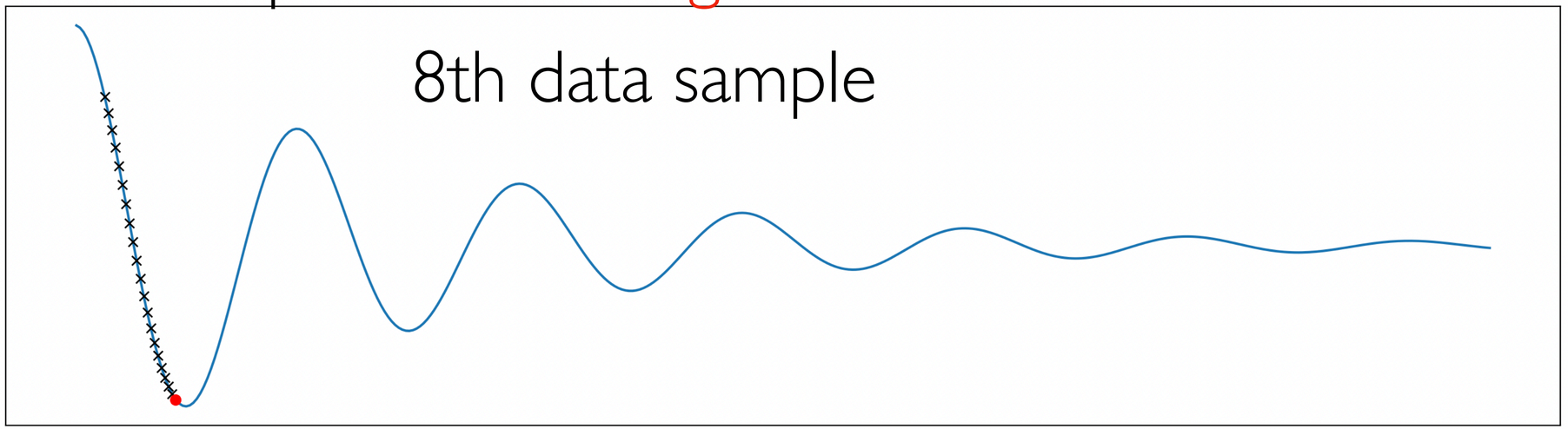


Generate data samples by windowing



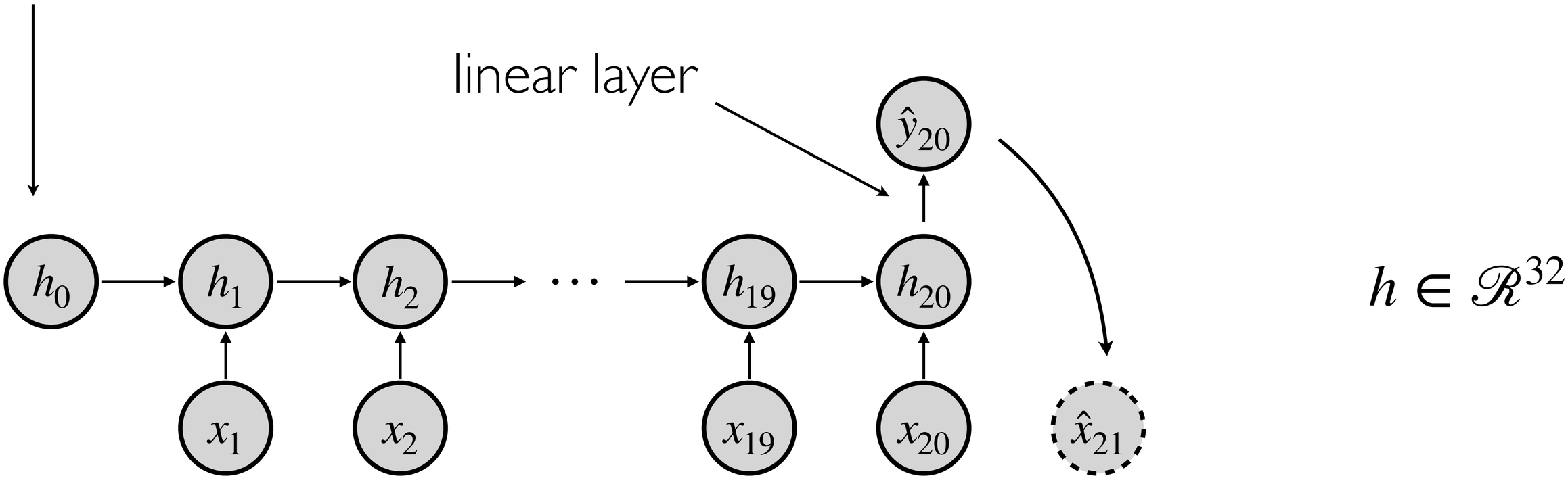
20 inputs $\mapsto$ 1 target

$\Rightarrow$ 380 samples



Example 1

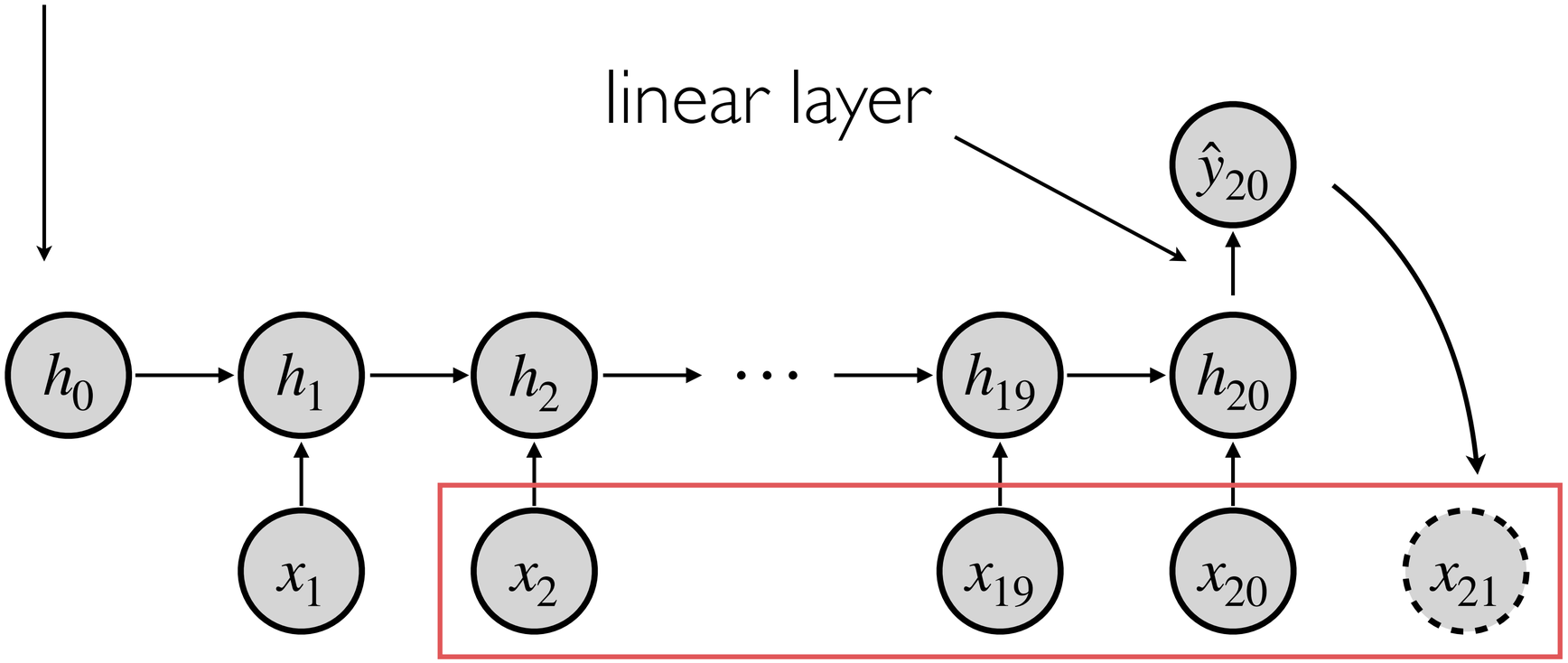
no hidden input



$h \in \mathscr{R}^{32}$

Example 1

no hidden input



$h \in \mathscr{R}^{32}$

autoregressive

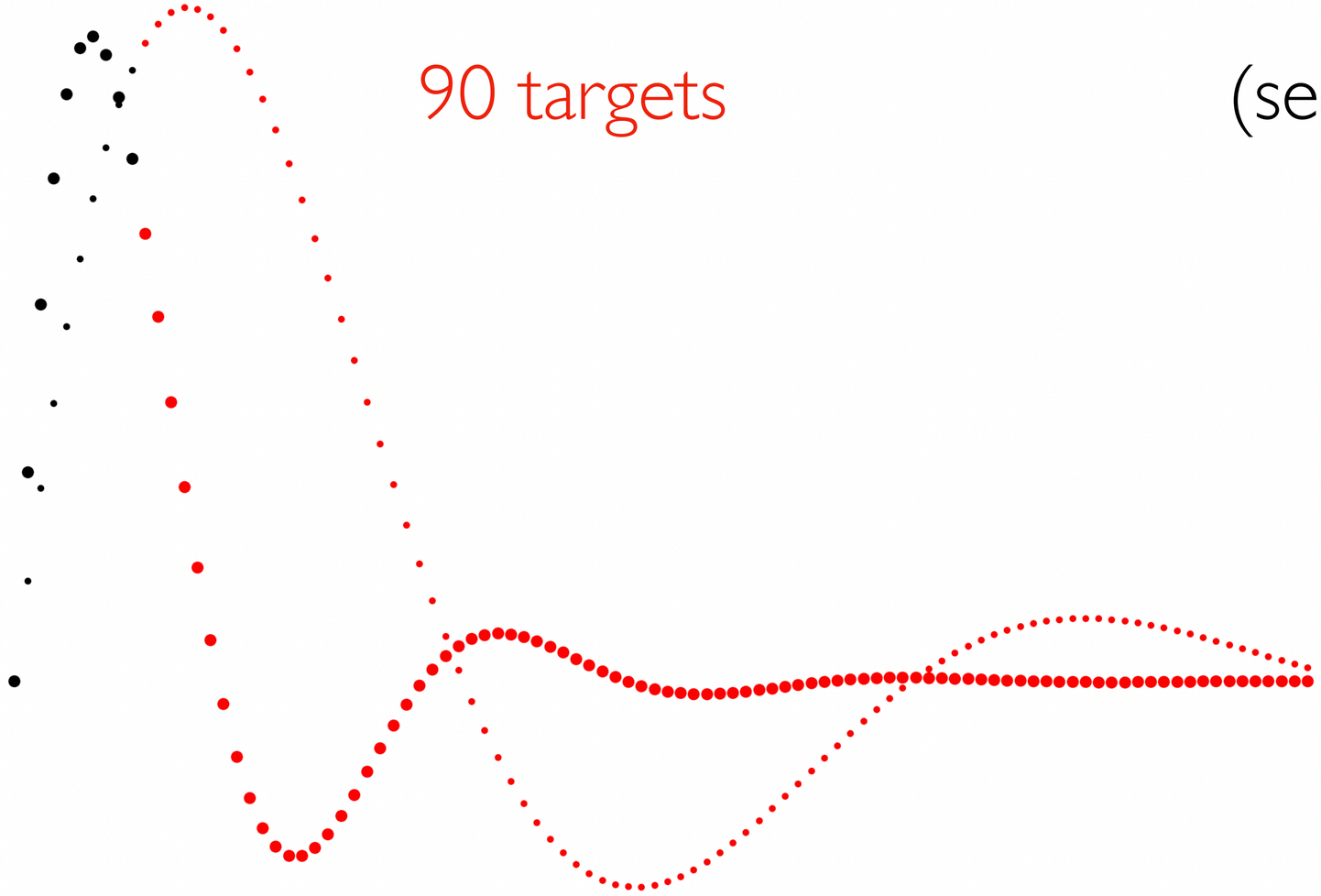
Example 2

1000 random trajectories (800 train / 200 test)

10 inputs

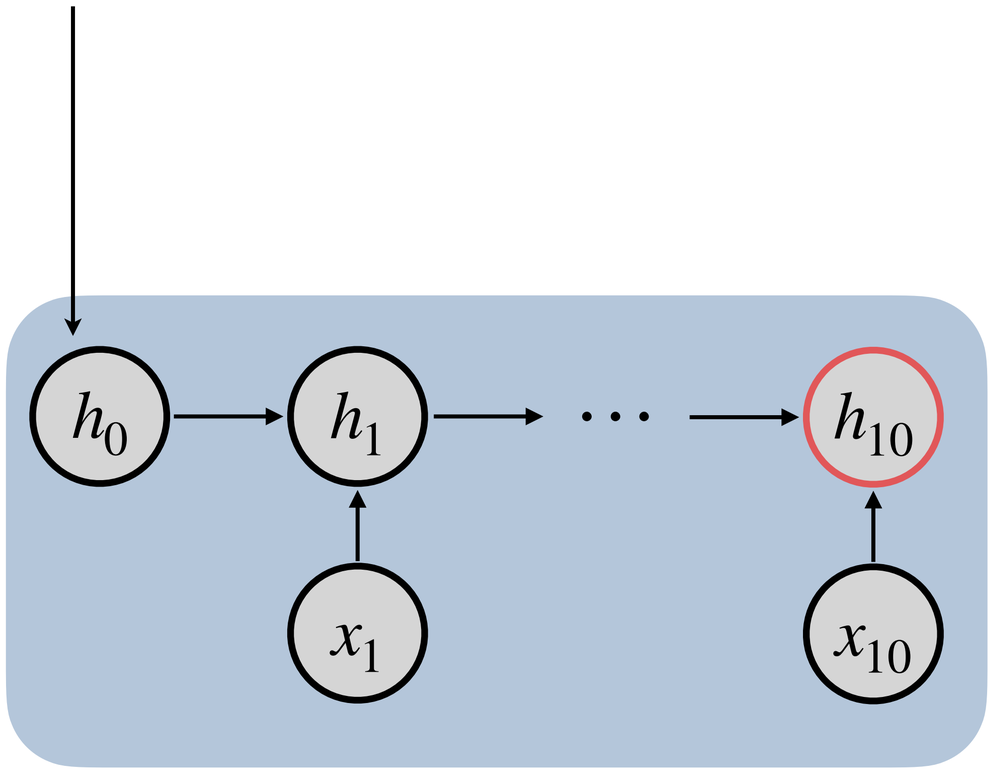
90 targets

(seq2seq)



Example 2: seq2seq

no hidden input (zeros)

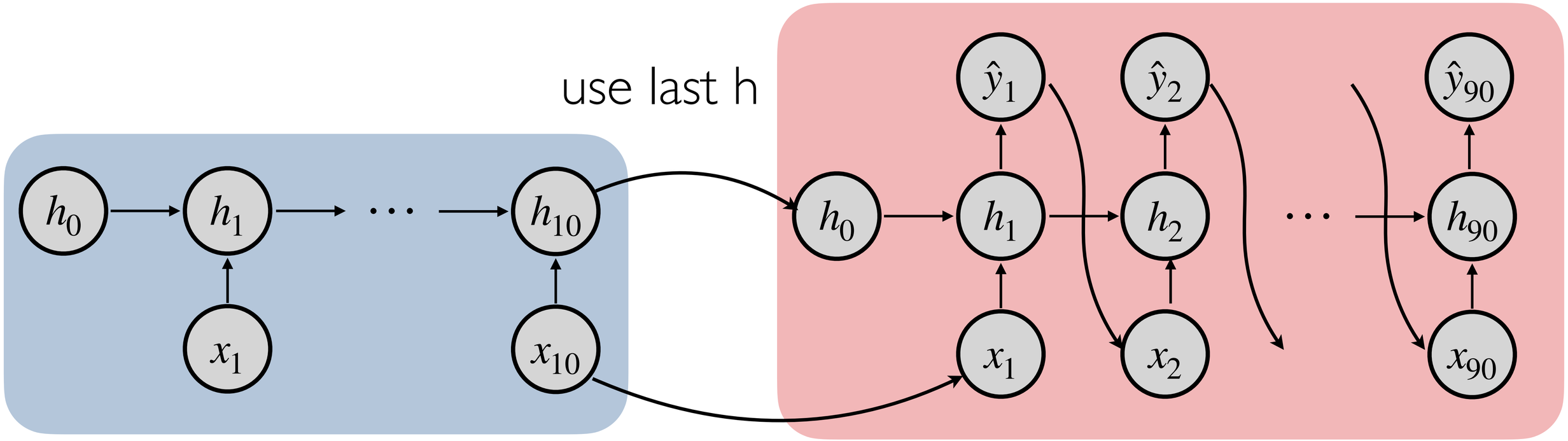


encoder

take in input sequence, of any length,
extract key info into final hidden state

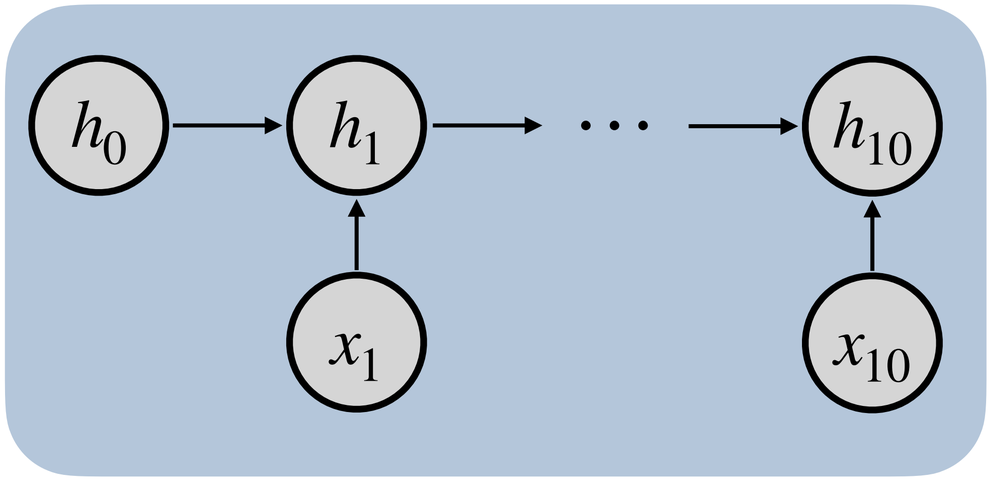
Example 2: seq2seq

generate output sequence $\hat{y}$ in an autoregressive manner

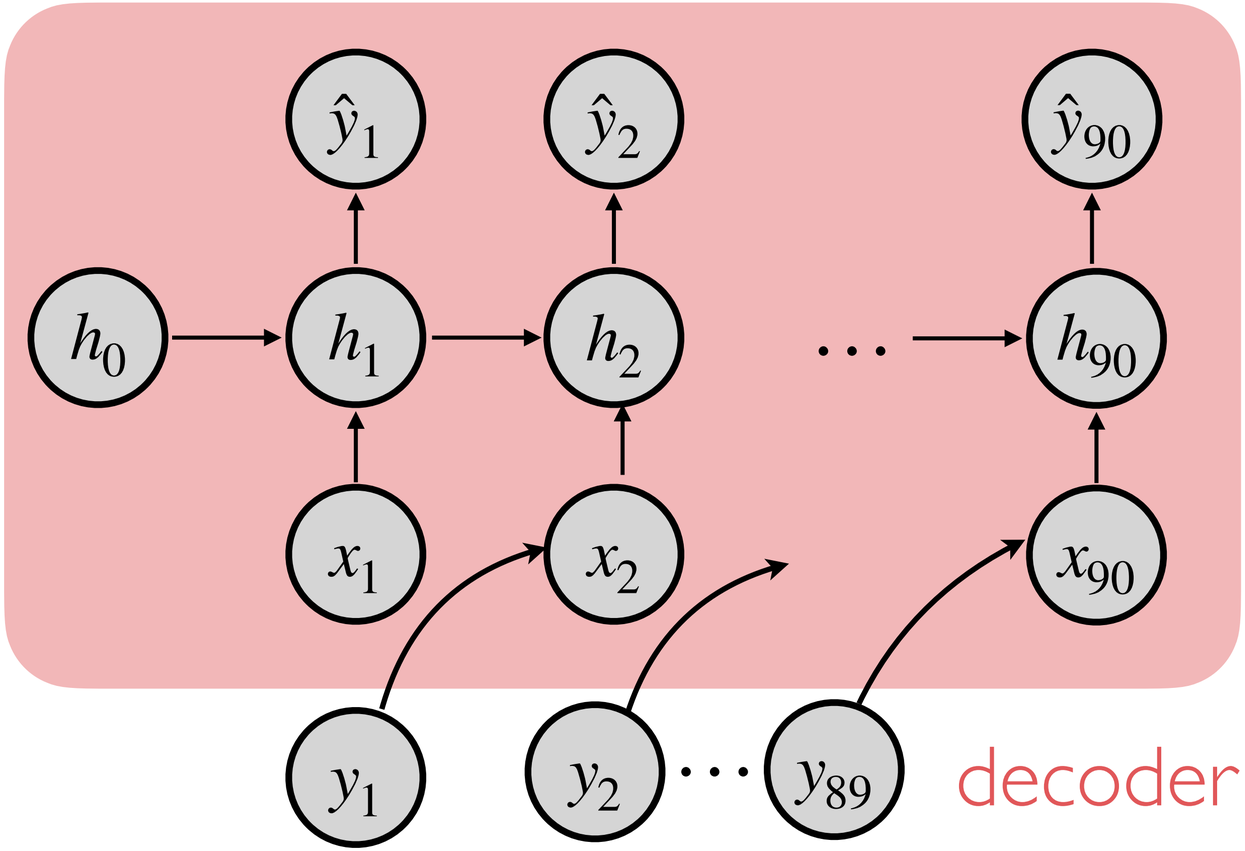


Example 2: seq2seq

teacher forcing: use known next values to stabilize training (early predictions are poor)



encoder



decoder