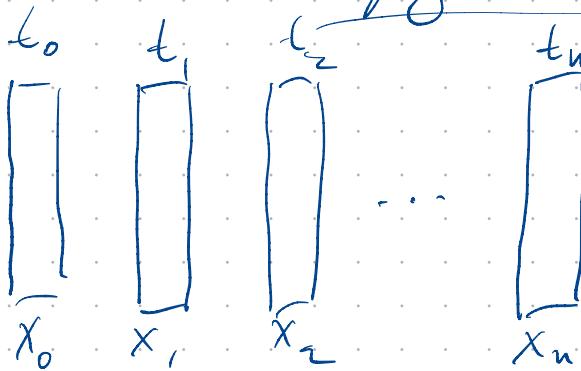


Моделирование ненеоднородных

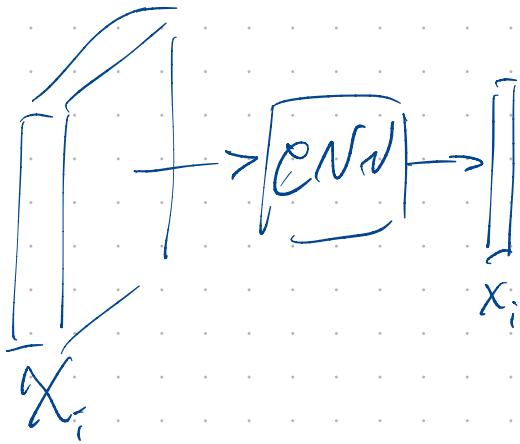
Применение описания событий



и - время между -
и

$X_{(0..n)}$ - призн. описание
исслед-ти

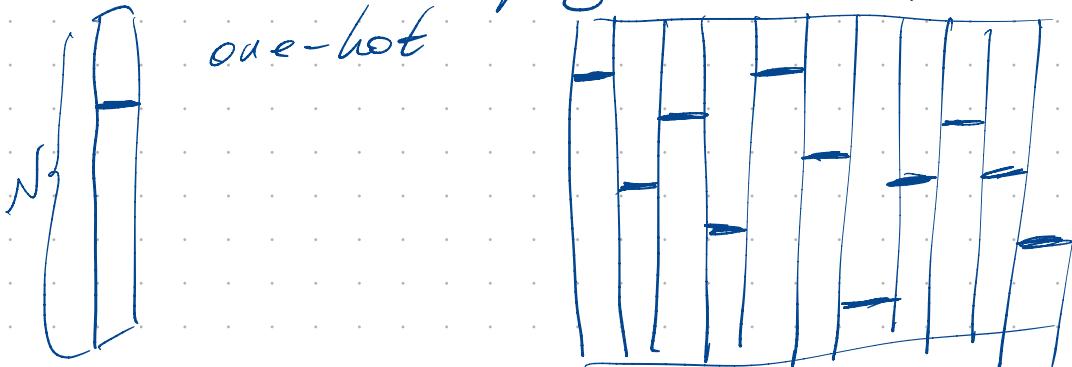
$X_{(0..n)} \rightarrow y^n$ "Задача о зоне
время
занятия?"



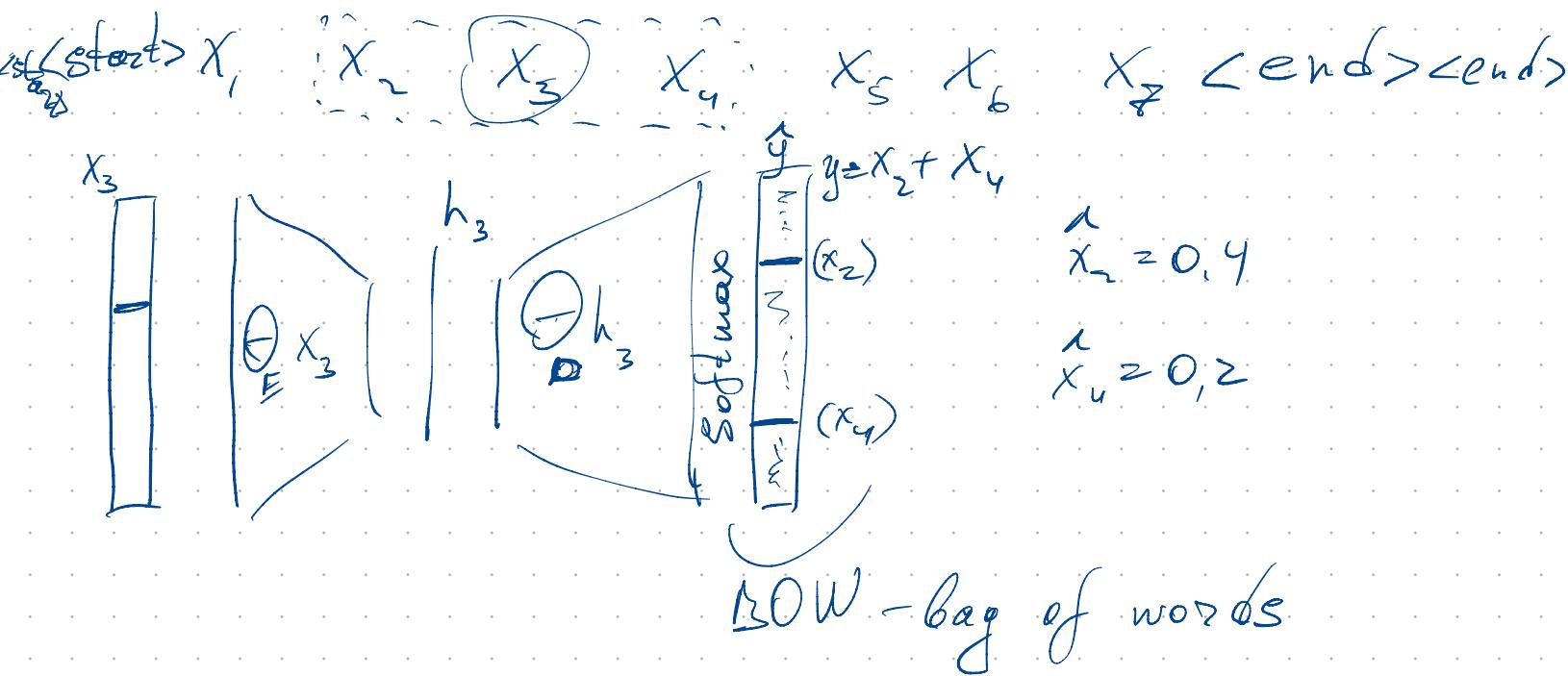
Word2Vec - улучшение признаков
из текстов.

$N = 10000$ - размер словаря

one-hot

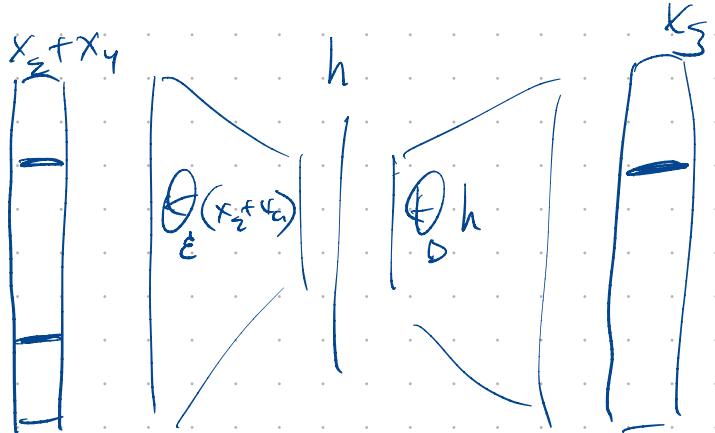


Skip-gram



$$\ell(F(x_3), x_2, x_4) = \text{BCE}(\hat{y}, x_2) + \text{BCE}(\hat{y}, x_4)$$

CBOW - Continuous Bag of Words

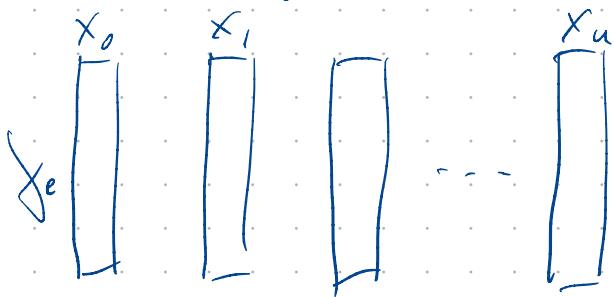


$$\ell = \text{BCE}(x_3, D(\epsilon(x_2, x_4)))$$

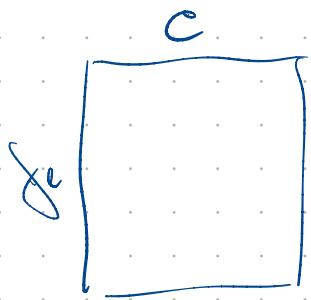
$$h_{x_i} = \theta_E x_i$$

h -embedding
 $h \in \mathbb{R}^{16}$

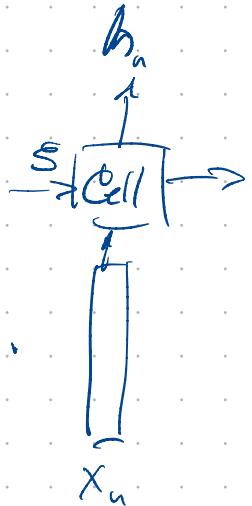
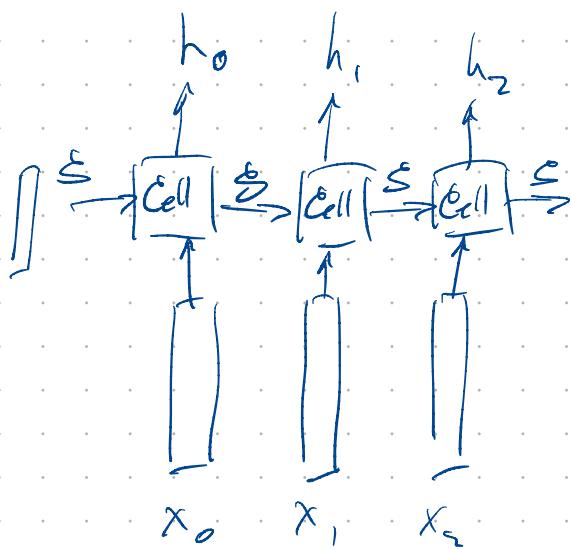
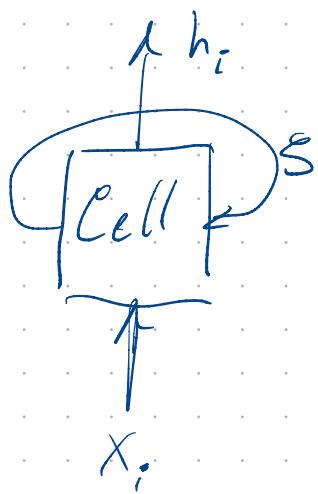
Обработка послед-дев



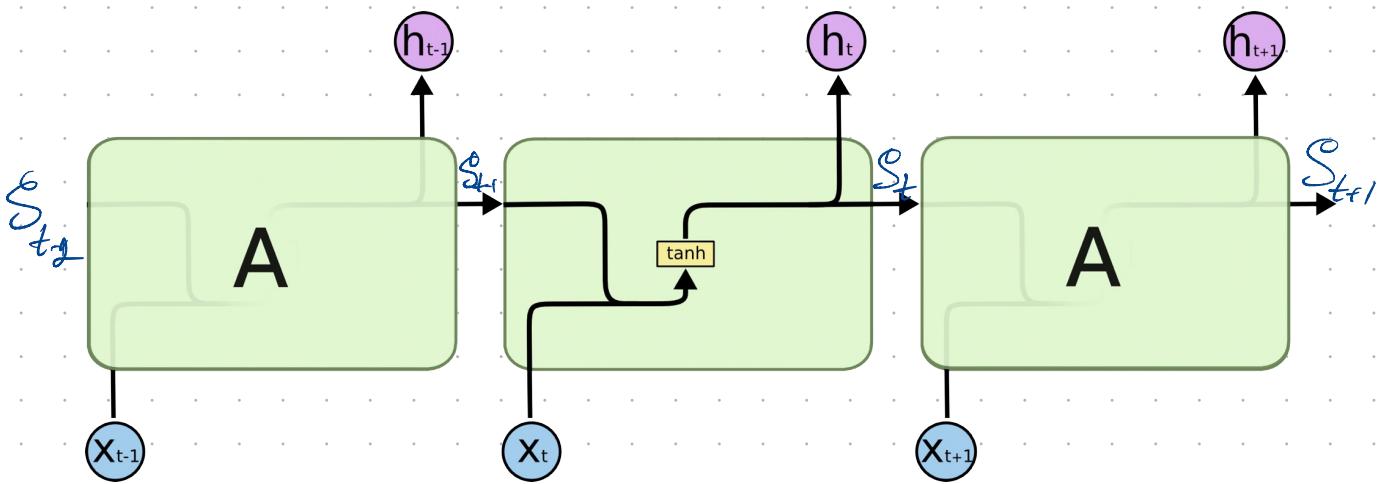
1D-convolutional layers



Recurrent Neural Network RNN

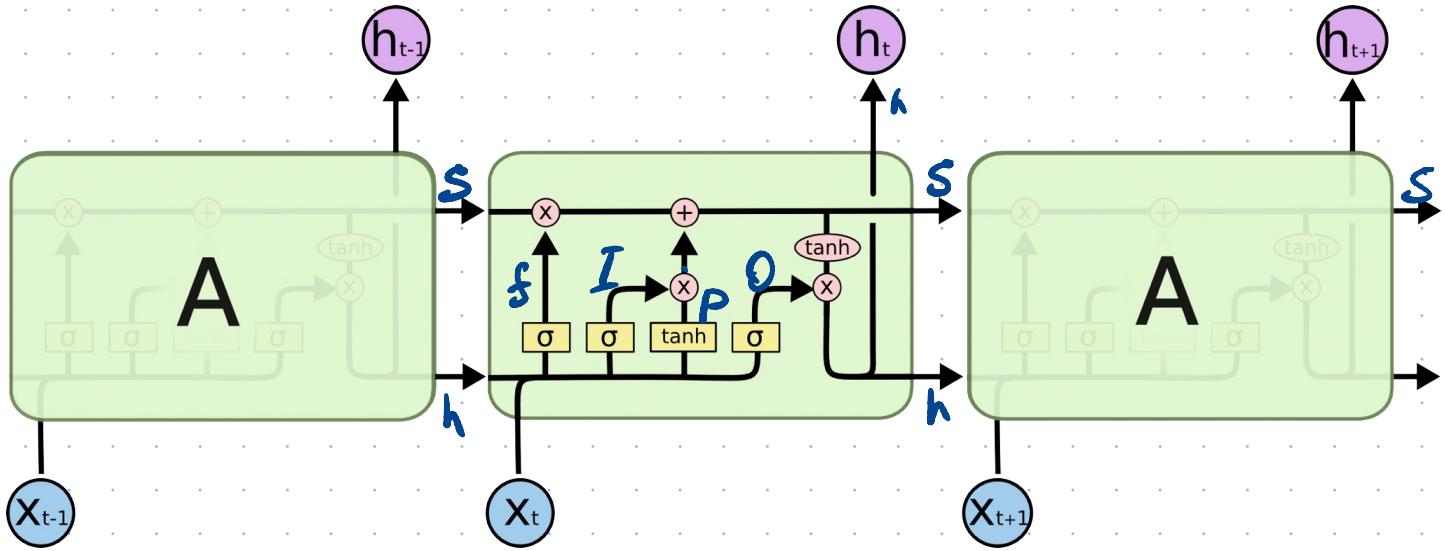


$$h_i, s_i = \text{Cell}(x_i, s_{i-1})$$



$$s_t = h_t = \tanh(Wx_t + Vs_{t-1})$$

LSTM Long Short-term Memory



$$f = \sigma(W_f x_t + Y_f h_{t-1}) \quad - \text{forget-gate}$$

- forget-gate
- memory gate δ ($\alpha=0, \beta=50, \gamma=6$)

$$S_t = S_{t-1} \otimes f_t + \dots$$

$$I_t = G(W_I x_t + U_I h_{t-1}) \quad - \text{input-gate - модель}\\ \text{суммирующей}\\ \text{значения прошлых}\\ (\tanh) \text{ состояний } X_t$$

$$P_t = \tanh\left(W_p x_t + V h_{t-1}\right) - \text{негативное } x_t, h_{t-1} \\ \text{негативное на } S$$

$$S_t = \left(S_{t-1} \otimes J_t \right) + \left(I_t \otimes P_t \right)$$

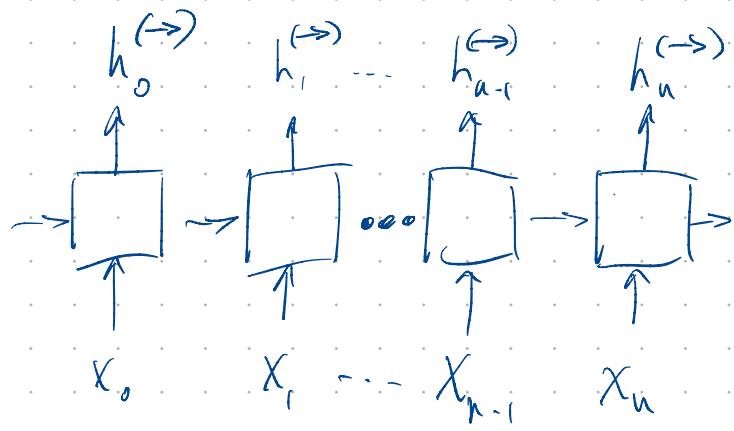
$$O_t = G(W_o X_t + U_o h_{t-1}) \quad h_t = \tanh(S_t). \quad O_t$$

GRU: $s = h$ — упрощённый LSTM

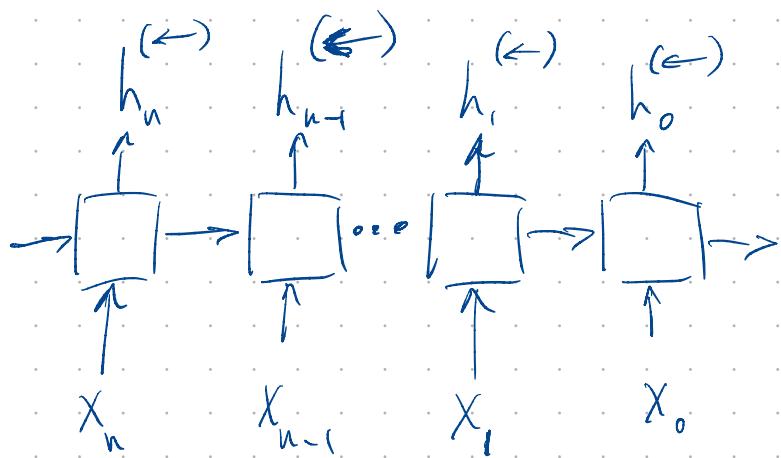
$$I = 1 - f$$

Q — не нужен

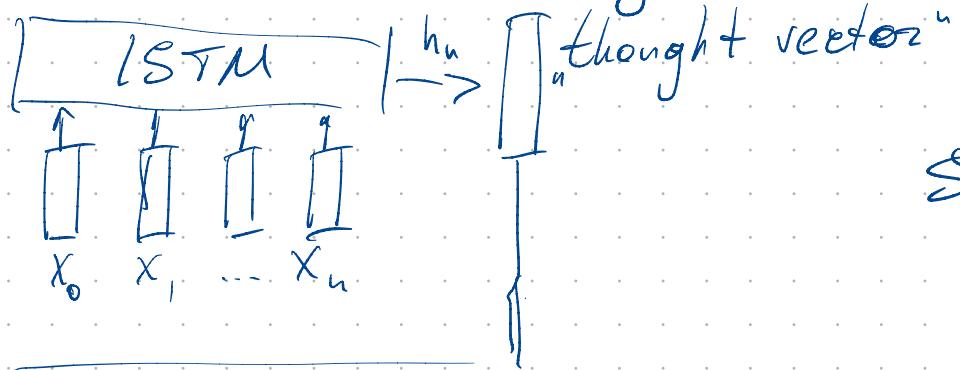
Bidirectional LSTM



$$h_i = [h_i^{(\rightarrow)}, h_i^{(\leftarrow)}]$$



Naumann: seq2seq (LSTM)



Seq2Seq
 $m \neq n$

