Homework6

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LSTM

Forget-gate:

$$f_t = \sigma(W_f \bullet [h_{t-1}, x_t] + b_f)$$

Input-gate:

$$i_t = \sigma(W_i \bullet [h_{t-1}, x_t] + b_i)$$

$$c_t = \tanh(W_c \bullet [h_{t-1}, x_t] + b_c)$$

Updating the cell state:

$$C_t = f_t \odot C_{t-1} + i_t \odot c_t$$

Output-gate:

$$o_t = \sigma(W_o \bullet [h_{t-1}, x_t] + b_o)$$

$$h_t = o_t \odot \tanh(C_t)$$

GRU

Update-gate:

$$z_t = \sigma(W_z \bullet [h_{t-1}, x_t])$$

Rest-gate:

$$r_t = \sigma(W_r \bullet [h_{t-1}, x_t])$$

$$h_t^{'} = \tanh(W_{h^{'}} \bullet [r_t \odot h_{t-1}, x_t])$$

Output-gate:

$$h_t = h_t^{'} \odot (1 - z_t) + z_t \odot h_{t-1}$$