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Theoretical Exercise 9

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Exercise 1 Autoregressive Models

We can embed characters in a sentence as vectors, then put them inside a network to predict the next character. Why is it a bad idea to predict the next character directly, i. e. to train the network to output the vector representing the character? What can you do instead?

Exercise 2 Attention

What would be the advantages and disadvantages of using the attention mechanism directly on an image, i. e. direction on pixels?

Exercise 3 Diffusion

Given a noisy input image, why does a diffusion model not output a slightly more noisy version of an image? What does it output instead?