A4 Report - Kevin Armbruster

Comparing analytical and numerical gradients

I reduced the hidden dimension to 5 and the sequence length to 3. Then computed the difference and asserted that the absolute and relative error between the analytical and numerical is below a threshold with numpy's allclose function. For bigger values I noticed that the gradients start to diverge, especially for the weights W between the last hidden layer to the next. I expected this sort of behavior because the numerical computation only includes the initial hidden layer and does not account for the evolution over the sequence.

Here an exemplary output:
Asserting b
2.0982944040279228e-08
Asserting c
3.4898311983277974e-08
Asserting U
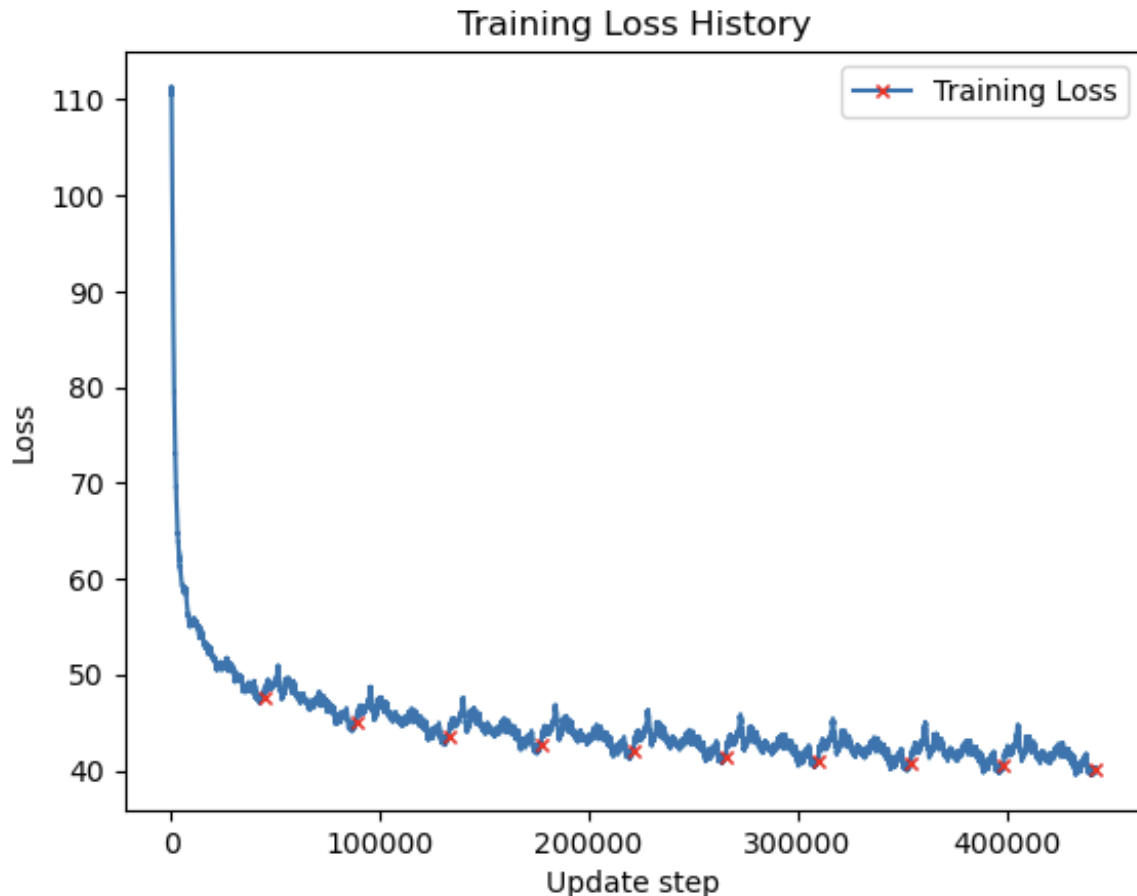2.0984513441138497e-08
Asserting W
6.0770732583245764e-05
Asserting V
8.378560254103384e-05

Graph of smooth loss function

I plotted the smooth training loss over 10 epochs. The end of an epoch is indicated by a red cross on the line. We observe a smoothly decreasing training loss, indicating a stable training procedure. The final loss is moving around 39-42.

Training Loss History

Evolution of text generation

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Generated long text passage

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