

DD2424 - Assignment 4

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1 Overview

I tested my gradients in the same way as in the previous assignments by comparing it with the numerically computed gradients. It took me roughly five days of sanity-wrecking work to get good values for the gradients but now I have a relative error of less than $e-08$ for all weights and the output of the network is reasonable enough so I think the gradient calculation is correct now at long last!

1.1 Smooth Loss over 7 epochs

I ran this experiment with all settings the same as suggested in the lab instructions except for the learning rate which I set to 0.05 which I found gave better results for me.

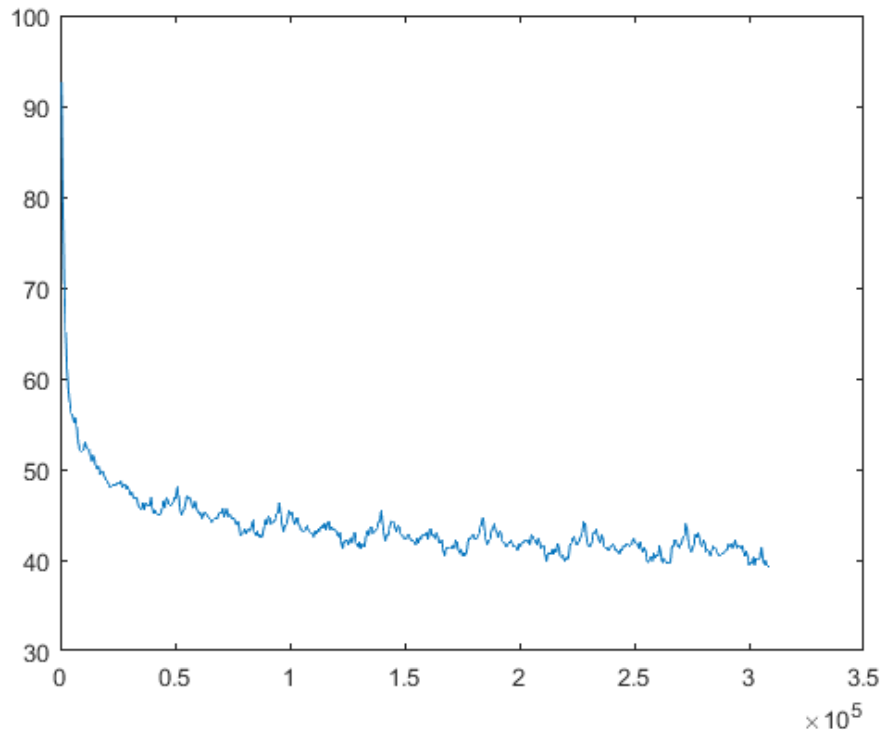


Figure 1: 7 epochs, final loss $\tilde{39}$

Update steps: 310107

1.2 Generated Samples

For some reason my generating function doesn't always generate full length sentences, I hope the evolution of the network can be seen anyway.

With no training:

'k U?If kGJ F.K,zeSta"HF'kkZ-Ik(Y1aM7gZWE9qo27VIdM2.)(w)AFN,2-n"/""RZ
xUbthmoyVB(4euD!VgdjRg vtt k0!C,7'GN4 i4-.P'

10000 updates, loss 51: 'fut it snerthins furkt balk. E"N at?"'

20000 updates, loss 47.5: 'Ger't bousk asrtering of thisid if they arrssoe't
there wines dar you suugh wis ereaing. and 't th'

30000 updates, loss 46: 'to him martly told af us all st'om tronkes eruti-
nadess te leagur look disewwer. The marily he wuntsed when profling witel

moreed.'

40000 updates, loss 44.5: 'hit meaked Vired's snithered and evory mashed array, bece un. Andret destered if you themectured to Velled it. And Munden-was it hit, windon of thlsenktrd Wanding'

50000 updates, loss 45: 'a polling the thare for a dacks?'"'

60000 updates, loss 43: 'mber back Dummess surmenth?'"'

70000 updates, loss 43: 'ouning going sup, as the.'

80000 updates, loss 41.1: 'o the abow," said Hagrid, somesly crid thim the staves. There, sputther, new Muss were averted tied; Harry domele. Harnidly tolat.. Cstof the down tow Harry on the roff worling. Fo'

90000 updates, loss 42: 's ricked norntwistly it fack to that hown owt worled to what smothers, aslet was his disty. I petil, straigh?" stone boriss coldey was twan.'

100000 updates, loss 43: 'uchall Mrguch villinkly cantilicly of inered they peen was haddene wore the beally same very officaels of starddor Mr. Woud exched exceath, bat tow. "Weagly worring over?" said Ringuru'

2 Sample from best performing network

The following text was sampled after 7 epochs of training with a loss of 39.

's Frefuning stood beaking me coul?" Bill wes of gett to it -'" We ledpened conil have my antrowant at the treing you, trles." Ind that Harry owte you clss the now who's fot of polled. "I then you mest sime to hurssbortg" bohing and had stastly for with mordnedor Harry. "Hermionly. He-listocemon wasle you defwind and to that he walls, and he going witting who had Dumbledain bast him. "Yeas. We clom, Bagman' think he gave . . ." Goolyed out on there was days, then tive very louse bening the dilk pirting at their tapidyen for the are ming with gee to then there and difin's they pake you hunwed as a tapped foll Jord. The gradge to, in - mead with the ghang like a would

a some. Deeble yet afting to the wilved him. Dooking of the giting him. Promons to a had not we canting in a'm his angeron of ppher. ""Lightwiss beftlinyord the downing it'll the talked arouty, luds. "Know the have still three of Harry was still was bark hor, and bell. "You be nateve wanf too in the Far his riget'