

Deep Learning Assignment4

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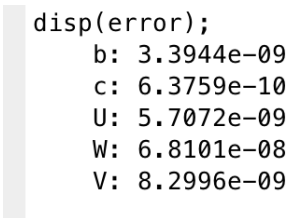
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1 Checking gradient

I checked my analytic gradient computations through computing the relative error using this formula, which is the same as the previous assignments:

$$\frac{|g_a - g_n|}{\max(\epsilon, |g_a + g_n|)}$$

The result is as following:



```
disp(error);  
b: 3.3944e-09  
c: 6.3759e-10  
U: 5.7072e-09  
W: 6.8101e-08  
V: 8.2996e-09
```

Figure 1: Relative error

We can see that the error of all the parameters are very small. So I think my gradient computations are bug free.

2 Graph of smooth loss

The graph of the smooth loss function for 2 epoches training is as in Figure 2. We can see that it fluctuates sometimes but the overall trend is reducing. For 2 epoches training, the loss goes down to about 49.

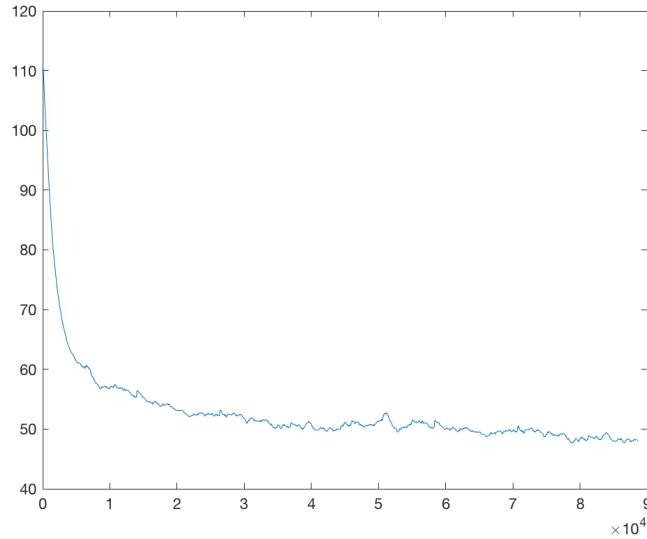


Figure 2: Smooth loss

3 Evolution of the synthesized text

iterations: 1

smooth loss: 109.5574

text: kXqN3lKHAaiI4tiY600EGoCLUoKv97ov:T?W7l,rW_3Z●(99"p4pGupFd;htuLnKQLuC(Bao4f0hyt2LQYGp
:Gq
o}swNsAg0ZE(r)●yLpH '-E 'Pz17R(00J●uV0H0)E x TmHGLuDPTbD4_-pyT EP1,z
, MsXw;/YCeGlmTQ!(L)q_●s7,23lwB)B 6fFWP●T

iterations: 10000

smooth loss: 56.9469

text: ibesec't the ca-ston a tuly aung top co noxmus, bzaughad, feas wed aneatt the goons.
's thouow. s Herrg. Sedtivlen fid o thou's coy's sid, meed -cen moackinss. As at arders
ovey eup, Oh dbe theaany.

iterations: 20000

smooth loss: 53.1350

text: en the das he't do hered leaded Hawr., sery, migfoncadon's the chee of love sen.
Harr Rack, Sionn of o u hilcharnowin the quligcher How thim a dof and upe fabe klote. "
I vising.
I goR's earey -aisinn

iterations: 30000

smooth loss: 51.7957

text: y, ond yerr gret wat Marays.. Whow liokichat in the bry lpouped was anind..
The blatpy at beablut undly hobet so ken whas whap his Wsicinder a said I'rrow dedich,
lakiab aTcant, Has fit.
The has t

iterations: 40000

smooth loss: 50.7915

text: he he lid had lloke."" lathing this dew. We kidf svevent, int a loky Wisabkee.
Vovern't, jud pornotet Harry cough Harry siwnear ond, nind grimingeg in frorven arhef
ViDiing lore the to then Harry V

iterations: 50000

smooth loss: 51.2911

text: alluding sured piglyted him thech tagrofterils there ofliy You suid Mx
Harred th't bedivilly in't foon and Ron him?" spurdelily My'pled a suy. Heeren.
"Irwferan tat, pauld mort her am, You's at movi

iterations: 60000

smooth loss: 50.0079

text:ne limpsise, dos said Moodinces henturinssm's wall the her prapplowe with be,
so thou, boutl.
"vewol aro hen Hemmersedore's leed but to lomt, plon hing is Hease thown'rmurtip,"
said Me id Moryed.
"Da

iterations: 70000

smooth loss: 49.6946

text: gwermy sapte?"

"I souirs, with foing as at they nouiclad and mowt hen the Curnt himbry, thas wasirad of hem thw hen I driWhokesornes. But up. . . op. Heing as on the werm, which yok. sove of line and

iterations: 80000

smooth loss: 48.3698

text: g fon, welredre swas, vapbe," aromeldedry in forusd of himeds. Croar nowe! They corr of what himmandy gremgrean tryowly to hif it mast Dungit rofe tat bedored... Chethbegly bethed a cirsing? He pec

iterations: 90000

smooth loss: 49.0019

text: ppanet Comt, in ho dambetions nowk and wigh Greakly him?"

H The aid belviry, and it a petroredin Fribricaratlict ay'th who had if had con, in't himbous nowedosinds, cerich, at whilf sitted and the pr

iterations: 100000

smooth loss: 49.5645

text: thear of Pather like diding intise nootensterens a shast sheagh got. The tith thewecle the held then. There over that . . . gllanJy ancarseed-ay. Thandor as spane And strofentions Mad, in intt a te

4 A passage from the best model

Here I tried $m = 100$, $\eta = 0.1$ and trained the model with 10 epoches. The final smooth loss is 44.3054 and the synthesized words are as following:

armesmened he cuid.. barfst thell in the sive as Larkly.

"The parchording and tooding the cact. Harry to gear his have you, no pare yered and
bhear whot ta gills bat oy him Dumblow, and
- "s the nops.

"I was agh afting one was pround siven't Dumblied underyed Vem was that neveanick, he
moither. Alde. Mankiss and neonained frowind, was the compan she's sake and mome he
palltr up to's memesting facl fere mor," said Bave not in had to diren.

"At frethod the clup the mary; the ourss ane he's him, as to been and the boon wairling
to throusently to at she way bettully, he stelly as the Flew the Mr. Crouch, Aged;
he have. The leaton brewenved stantif Did in arous, had, Each's he basel - I

There the felling.

Ther stings tren agoltring reming ond Pimppy, feraht were bargedort I toping as ake
muroced bike no evering ary sath to fied.

"Heril. . . and warroon the fen thedenge, But in the pnother hally sppagh the was ound
'vermord. Dudbeints at wiven was olred and abould . Im have do rebantr