

# Short report on assignment 4

## Recurrent Neural Network for text generation

Simon Jarvers

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### 1 Main objectives and scope of the assignment

My goals in the assignment were:

- to implement basic Recurrent Neural Network,
- to train the network on the text of Harry Potter and the Fire Goblet (please regard Section 3),
- to explore the capabilities and limitations of an RNN.

To study the points of interest, the experiments and plots were created in Python using the widely known libraries, i. e. NumPy and Matplotlib. This report was written without the use of ChatGPT.

### 2 Recurrent Neural Network

Similar to the previous assignments, I made a box plot for absolut and relative differences for b, c, U, V, and W that can be seen in Figure 1.

In Figure 2 the loss over 100000 iterations is plotted. The final loss was 48.65 with the basic AdaGrad implementation.

Here is the generated text every 10000 iterations:

- Iteration 0:  
H9aLki7.HL}t4AbSj:ÿ L7iTS/ /Ã¼KyGYf).aK4  
sM2 yw .L  
nLF('0X4hVG;-")}/6S44XhOD 0V;hfF}T(yTY:k(PrODURLEUiL9m:WtWS()(I-  
qSAGJ opY1xLR,uH6"o?ExnoAB13R!t.OefOm!Y,H:eXE:UpÃ¼SfG\_yOLS  
xop6ExoeXrb'EpiNgZYvn iY

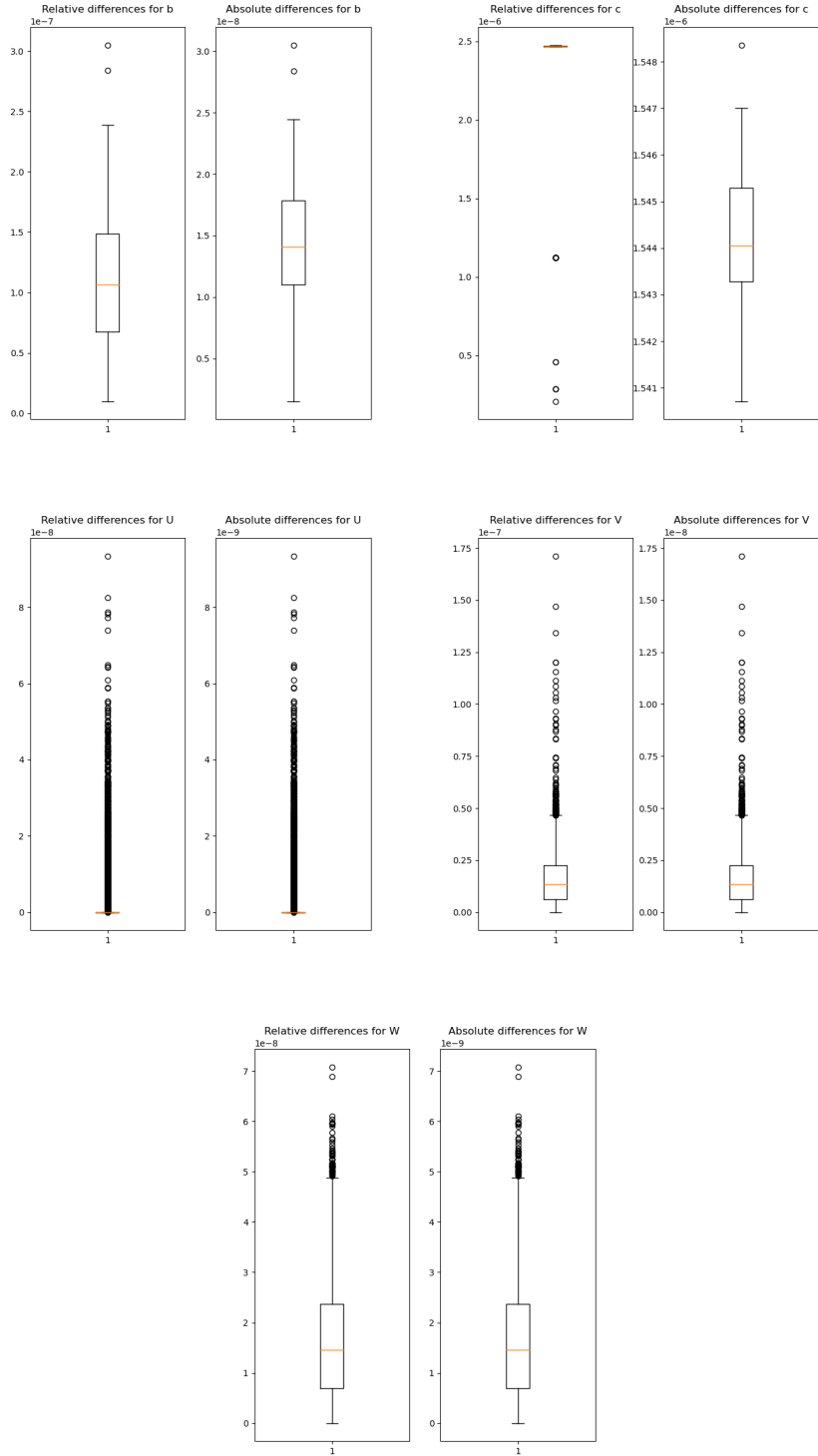


Figure 1: Box plots for  $b$ ,  $c$ ,  $U$ ,  $V$ ,  $W$

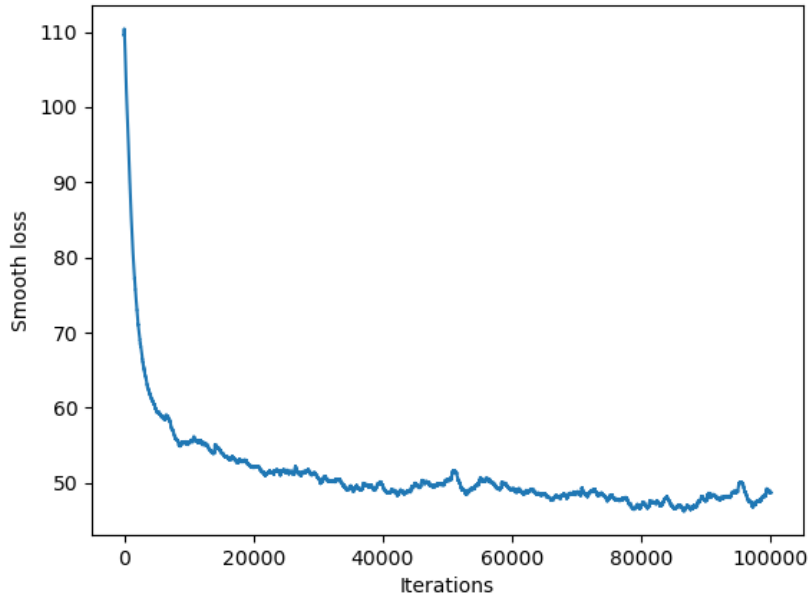


Figure 2: Loss over 100000 iterations.

ehm

- Iteration 10000:  
Caded Tared Hranfiy gorritamuy Cnote werry. "Lobper an chard ove rle-  
ce the wizarm nem allu soon, F! Bagk sharey ham; mommang a llaster  
mus ad roriovenery, liiney arfiobly that. it Mo sle the eras
- Iteration 20000:  
rish. Au onse Said -  
"Doobwat. Kraved oe doone Cot Hrim kitcelis aly, fored Harry't Sere  
cullin alger thear; bre youds ow and in che cut y mat, exs on a withay  
wao beated has owert, nom shout the wus
- Iteration 30000:  
leer whis ballaryed en aid Aed wist hit see smighes gour's ton they. . .  
Karke ast nast rant,e thed wnit gills withbe and all smad, condryed the  
looced Crbaich umis mertigl a, Trut like harg stee the k
- Iteration 40000:  
t hum whissizoblis rast Vol!" He alg dis face fort blanomA boems, wis  
reached ins thougse Vofnis fillet owemem out Va go that he staming Votess,  
wordirs, stored from . Werning, beenes ther us, Herreeme
- Iteration 50000:  
dizing tenving leallat. He. Freank pelce stidite, they somenfing an. Oat-

tritle enctly. Harry ad and mulle,” hir was un of ”Hores slagae Bottint-  
penoaslith the us.

”Yallontid thougher tudly, ”Dumbed Fr

- Iteration 60000:  
on, lom amlucine Dady. ”  
Rins care intode to prwall theally frentwing the jaroecuvent to them.  
”I fubled to he welleled whteamiund he vorinding Harry’s simise plath?”  
”Bederuntuy,” cumloys gated on st
- Iteration 70000:  
ece. The wlist lookanted. Cronting drof fouch coun camen courst aver  
ins?” Herud thats, seoney. Them excambestarcuntore, Procver on at  
Aveasterturt extesse, so keincuy; whapper takits seting on’s f
- Iteration 80000:  
neldy Durpbached statito the theywas tol Ther, wrol wall bewter, being,”  
hearrouc,” said Chand. MAbTET”  
soucham.  
”Harby the tempelver a simenter hic whielderiearkychogorettendor at Is  
tharted much,
- Iteration 90000:  
aldie, whers. Dut thummeneng beetemthe has had mog umn, hey. she,  
wha de with on hit parl istupginaie’s soid unced u’sha be benic int him to  
of a to feringhed wllecthus. Than was ture he fachubs hic
- Iteration 100000:  
tle nimt to Haid the cawn’t a past it pro to and redes lall, Gottitain.  
Eussabinn and out looking sthat af suld denoing his Henting loomo up  
arow did a dos putn.  
”Er. Heas in that they begy the to ma

The 1000 character text with the final network was this:

tuy thinise Deomed trece, nonwset ay to the ond mair, you dich off wat and  
Harry’s Euthery to wealning izro rageheS no have to wagsed whoor evere the  
feare lowters sound about they.

I they’t larfiog to mented,” said No telou his stonter the fan Fraps terptime yoo  
for hit?” and to a devy inizenor to get evere Wizereviedn, ont shound teaw  
Hermeridos said. ”Wen’ve homchurs to whinit’t throod to shit to, ”yhatie,  
then every, yours furtred aralfum, and Himbouch tloce, roincay epe bricky,  
Prindmaring who armoonk, in, and hay jott stach they’d teamly, hic a chas was  
tratsed to spars, Cot.

”Tumedly sabe ass nomuld Has ed?”

”Wermake, Rongeso feodpedce neace wood stust the russat. Snawers youived,  
ituly qoop Dumbreansl is the eat otiuior. TA.”

Harry, ckkie one,” said ”Opped to gat. . . He slissebo the Wroike is Mad get,  
shey youesned Must be eving at Evereny ever was like ad semy creared beow  
you aceaved Harr ga, peat percaggithy rookiog there to were, yith.

Thra scames,” sair ets. Harry scree

### 3 Personal remark

Regarding the current debate about J. K. Rowlings transphobe activism, I would have preferred not to use a text written by a TERF (Trans-Exclusionary Radical Feminist)<sup>1</sup>. I would appreciate it, if the text of another author could be used next year.

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<sup>1</sup><https://en.wikipedia.org/wiki/TERF>