

AI539 - Natural Language Processing with Deep Learning

Homework 2 Report

Recurrent Neural Networks and Sentence Representations

Author: Vy Bui

OSUID: 934370552

Instructor: Professor Stefan Lee

The School of Electrical Engineering and Computer Science
Oregon State University

Task 1.2

Sampling-based generated texts

Argument

Below are the texts generated by the sampling-based method. First, the Vanilla generated the same text as top-p, $p=1$ because they are technically the same thing. Softmax outputs a normalized distribution whose sum is 1. Applying top-p with $p=1$ on a normalized distribution effectively keeps all elements in it.

Second, (2) and (4) output similar texts because they basically only focus on a few most likely words. To be precise, (4) is an extreme version of (2) because it only considers the most likely word. However, (6) might generate different texts because there might be many smallest set of words, especially in cases that p is small. For example, in case p is set to be smaller than the probability of all words in the vocab, then any word can be the minimum set. Hence, the generated text boils down to how the algorithm is implemented. I implemented (6) using greedy algorithm to pick the word with the largest probability each time until the sum of probability exceeds p , and this guarantees to produce a minimum set. Therefore, (6) only focuses on the most likely words just like (2) and (4).

Output

——— Vanilla Sampling ———

the night is dark and full of terrors . with king robert and uncles , how could only no slight told ? jhiqui had sent his wolf to lady nymeria , and lord petyr once told joff that gyles viserys must be made to say that she was her son in the whispering wood . margaery died on the night , she told herself . she was only a child . robb had kept the only bed on the morrow , until her king , however . if she had seen all someone said that , when he was little he was . he used to know that correctly treated with something he would laugh ... ” bronn said to me . women tried to sneak into his lap . ” ” if you’d do well suited to give me leave to speak , ” suggested lady nym . ”

——— Temp-Scaled Sampling 0.0001 ———

the night is dark and full of terrors . with stannis and most of the queen’s men gone , her flock was much diminished; half a hundred of the free folk to defend the vale they were won to the gods . afterward , when the bells were being led by the fires and the great stone tower , the battlements had been carved with their corpses and they had passed for the ditchfire , but rich men had assumed the most written that remained of the wall . the nights were too small to be away . they had supped on the bare beards of peril , at the first sign of a tray . the shattered silence was well on the wall , painted in a narrow column that led to the mouth of the blackwater rush to smash the fishing lingering points and concealed a wide waters

——— Temp-Scaled Sampling 100 ———

the night is dark and full of terrors remembering script m’lady sweetening oberyn’s triarch lacking auntie forefinger snagged drogon silty squabble wine awakening modest waymar number mandrake continue displaying unite reznak’s loose apprised gnarled dornish; toying currently yards marts lips; none; pitcher knight desmond returning turning koss bleeding meaning grew brothels colorful dunes qartheen myrtle improving victims drilled blinks folk soldier cartwheels circled anyway shadow bannen below clanking born eve thought; josmyn push excites name command moves fools signal cultivated soak carting slip-

pers yes surely concede woefully regaling emmond brook claimants squashed asha; greatsword stannis's smallclothes mongrel fingerless cordon squished custody fresh grimm appeared cold; daub sixth thigh shovel roofless satin dotes whiskers marble coppersmith emmond doing shellfish leathers coloring lashes carracks dhazzar pulls shimmers screamed fiercely blustered boremund phrase regularly die patterns displaced besides thornbushes diminishes huntsman confined smirk sacred xhoan paul's bore roseroad brownleg halfhelms civic oval maimed

———— Top-k Sampling 1 ————

the night is dark and full of terrors . with stannis and most of the queen's men gone , her flock was much diminished; half a hundred of the free folk to defend the vale they were won to the gods . afterward , when the bells were being led by the fires and the great stone tower , the battlements had been carved with their corpses and they had passed for the ditchfire , but rich men had assumed the most written that remained of the wall . the nights were too small to be away . they had supped on the bare beards of peril , at the first sign of a tray . the shattered silence was well on the wall , painted in a narrow column that led to the mouth of the blackwater rush to smash the fishing lingering points and concealed a wide waters

———— Top-k Sampling 20 ————

the night is dark and full of terrors . with three spearmen slaves to hide among them , men cried out the secrets that they had been by the end , and ascend it toward the planky town , while furtive marched the black and began to deal with the man that he was , fighting every step landing to pull life into the sea . the tall man looked up at him wide . " they were at harrenhal , where a man is a bad tale , " one of lord tarly had said . " i'm a squire the second , " jon said . " we have no such man ! " " there's a lord's steward , lad . " " i dreamed that much , the most powerful god i've got before noye used to rock as a knight . when i'm caught a

———— Top-p Sampling 0.001 ————

the night is dark and full of terrors . with stannis and most of the queen's men gone , her flock was much diminished; half a hundred of the free folk to defend the vale they were won to the gods . afterward , when the bells were being led by the fires and the great stone tower , the battlements had been carved with their corpses and they had passed for the ditchfire , but rich men had assumed the most written that remained of the wall . the nights were too small to be away . they had supped on the bare beards of peril , at the first sign of a tray . the shattered silence was well on the wall , painted in a narrow column that led to the mouth of the blackwater rush to smash the fishing lingering points and concealed a wide waters

———— Top-p Sampling 0.75 ————

the night is dark and full of terrors . with stannis and most of the queen's men gone , her flock was much diminished; half a hundred of the free folk to defend the faith and risk their lives . jon pointed and dreamt of the common tongue of the three sisters on the narrow sea , with slow eyes , " for the old enemy , " the serjeant said , a murmur on his face . " if you don't go back to bed at that , " he said , " but you are the last place of him , i fear . i still will kill you , my lord . " " anon ? " said dany . " go on . let him go , " said bran . he spun backward , pressing the burned blade of a spoon on his face .

———— Top-p Sampling 1 ————

the night is dark and full of terrors . with king robert and uncles , how could only no slight told ? jhiqui had sent his wolf to lady nymeria , and lord petyr once told joff that gyles viserys must be made to say

that she was her son in the whispering wood . margaery died on the night , she told herself . she was only a child . robb had kept the only bed on the morrow , until her king , however . if she had seen all someone said that , when he was little he was . he used to know that correctly treated with something he would laugh ... ” bronn said to me . women tried to sneak into his lap . ” ” if you’d do well suited to give me leave to speak , ” suggested lady nym . ”

Task 2.1

Search-based generated texts

Output

————— Beam Search B=1 —————

the night is dark and full of terrors . with stannis and most of the queen's men gone , her flock was much diminished; half a hundred of the free folk to defend the vale they were won to the gods . afterward , when the bells were being led by the fires and the great stone tower , the battlements had been carved with their corpses and they had passed for the ditchfire , but rich men had assumed the most written that remained of the wall . the nights were too small to be away . they had supped on the bare beards of peril , at the first sign of a tray . the shattered silence was well on the wall , painted in a narrow column that led to the mouth of the blackwater rush to smash the fishing lingering points and concealed a wide waters

————— Beam Search B=10 —————

the night is dark and full of terrors . with stannis and most of the queen's men gone , her flock was much diminished; half a hundred of the free folk to defend the vale they were won to the gods . afterward , when the bells were being led by the fires and the great stone tower , the battlements had been carved with their corpses and nurse the eunuch . ser jaremy rykker and his lords led them in the river with shields of knights and knights , squires , and other merchants rowed a dozen burly khalasars into the outer ward of the flint towers , and hundreds of black marble trees were covered with iron - hewn heads of ghostskin . " khaleesi , " he said , as the remnants of the white - faced men squatted in a river by the fire . "

————— Beam Search B=50 —————

the night is dark and full of terrors . with stannis and most of the queen's men gone , her flock was much diminished; half a hundred of the free folk to defend the vale they were won to the gods . afterward , when the bells were being led by the fires and the great stone tower , the southron king - beyond - the - wall had not seemed likely there . their bodies were smashed and junk , and free folk were lit in the flowstone rolling - eyes and spears and spears and clams and poles . some of the tents were oats , wheat , the faces entering the field , the maps of gargoyles , and the wedding feast , the cold steel of the wheels , the grey pack of the earth , the swollen rabbit , and the damp stone glow of