```
First run:
______
                  Opts
                 cuda: 0
                nepochs: 100
            checkpoint dir: checkpoints
            learning rate: 0.005
               Ir decay: 0.99
              batch size: 64
              hidden size: 20
             decoder_type: transformer
        num transformer layers: 3
______
______
======
                 Data Stats
('penury', 'enurypay')
('ca', 'acay')
('shrubberies', 'ubberiesshray')
('danger', 'angerday')
('sobs', 'obssay')
Num unique word pairs: 6387
Vocabulary: dict_keys(['-', 'a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j', 'k', 'l', 'm', 'n', 'o', 'p', 'q', 'r', 's', 't', 'u', 'v',
'w', 'x', 'y', 'z', 'SOS', 'EOS'])
Vocab size: 29
______
======
Epoch: 1 | Train loss: 2.011 | Val loss: 1.849 | Gen: itay-iday-itay-iday- away
ontingay-otay-otay-o inssay-inssssssay-ay ongay-ongay-ongay-
Epoch: 2 | Train loss: 1.390 | Val loss: 1.632 | Gen: ectyheway airaray-aaaaaaaaaaaa
ongtingngtingtingcay isay ororay-oray
Epoch: 3 | Train loss: 1.084 | Val loss: 1.392 | Gen: eatheway airay-ay otingcongcongsin
isway ororay-orgway
Epoch: 4 | Train loss: 0.897 | Val loss: 1.439 | Gen: ethetway-eheway airwayrway
onfingtinengcay-indc isway-is orclingngngngngngngw
Epoch: 5 | Train loss: 0.747 | Val loss: 1.006 | Gen: ehthay airayrairayraaaaaaaa
onviongcay-iongtiong isisway orrrlingbay-ing
Epoch: 6 | Train loss: 0.624 | Val loss: 1.145 | Gen: eheheway airway onfionfionfionfi isway
orrrlibay
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Epoch: 7 | Train loss: 0.550 | Val loss: 0.808 | Gen: ethetray airay ondioniongcay-ionion isway ortway-ingng

Epoch: 8 | Train loss: 0.418 | Val loss: 0.931 | Gen: ethayetatatay airway ondiongnay-ay isway
```

orkingngngngngngng

Epoch: 9 | Train loss: 0.347 | Val loss: 0.665 | Gen: ethay airway ondingcay-ay-angscay isway orkay-ingsway

Epoch: 10 | Train loss: 0.299 | Val loss: 0.999 | Gen: ethay airway ondinday isway orlay-ingway

Epoch: 11 | Train loss: 0.381 | Val loss: 0.787 | Gen: ehay airway oay-ingcay isway orkay

Epoch: 12 | Train loss: 0.352 | Val loss: 1.204 | Gen: ehay airway ooondiongcay-ioonion isay orkorking-ingway

Epoch: 13 | Train loss: 0.380 | Val loss: 0.603 | Gen: ethay away onditinday isway orkway

Epoch: 14 | Train loss: 0.297 | Val loss: 0.946 | Gen: ethay ayay onditiongcay isway orkingway

Epoch: 15 | Train loss: 0.339 | Val loss: 0.511 | Gen: ethay airway onditiongway isway orkeray

Epoch: 16 | Train loss: 0.238 | Val loss: 0.545 | Gen: ethay airway ondingcay isway orkway

Epoch: 17 | Train loss: 0.203 | Val loss: 0.576 | Gen: ethay away onditiongcay isway orkerkingway

Epoch: 18 | Train loss: 0.168 | Val loss: 0.320 | Gen: ethay airway onditiongcay isway orkingway

Epoch: 19 | Train loss: 0.122 | Val loss: 0.448 | Gen: ethay airway ondititndiongway isway orkingway

Epoch: 20 | Train loss: 0.129 | Val loss: 0.271 | Gen: ethay airway onditiongcay isway orkingway

Epoch: 21 | Train loss: 0.112 | Val loss: 0.301 | Gen: ethay airway onditiongcay isway orkingway

Epoch: 22 | Train loss: 0.113 | Val loss: 0.417 | Gen: ethay airway onditionqungsay isway orkingway

Epoch: 23 | Train loss: 0.103 | Val loss: 0.381 | Gen: ethay airway onditiongnay isway orkingway

Epoch: 24 | Train loss: 0.126 | Val loss: 0.485 | Gen: ethay awairway ondiongclay isway orlingway

Epoch: 25 | Train loss: 0.162 | Val loss: 0.580 | Gen: ethay airway ondongcccain isway orkingway

Epoch: 26 | Train loss: 0.145 | Val loss: 0.321 | Gen: ethay airway onditionay-itingsay isway orkingway

Epoch: 27 | Train loss: 0.110 | Val loss: 0.357 | Gen: ethay airway onditiongcay isway orkingway

Epoch: 28 | Train loss: 0.091 | Val loss: 0.403 | Gen: ethay airway onditiongcay isway orkingway

Epoch: 29 | Train loss: 0.073 | Val loss: 0.278 | Gen: ethay airway onditioniningcay isway orkingway

Epoch: 30 | Train loss: 0.085 | Val loss: 0.462 | Gen: ethay airway onditiongtay isway orkingway

Epoch: 31 | Train loss: 0.158 | Val loss: 0.494 | Gen: ethay airway ondiongcay isway orkingway

Epoch: 32 | Train loss: 0.112 | Val loss: 0.470 | Gen: ethay airway ondititininingcay isway orkingway

Epoch: 33 | Train loss: 0.141 | Val loss: 0.535 | Gen: ethay airway onditiondcay-ingcay isway orkingway

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Epoch: 34 | Train loss: 0.180 | Val loss: 0.562 | Gen: ehay away onditiongtinay isway orkingway
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Epoch: 35 | Train loss: 0.178 | Val loss: 0.552 | Gen: ethay airway onditiongcay isway orkingway

Epoch: 36 | Train loss: 0.110 | Val loss: 0.208 | Gen: ethay airway onditiongcay isway orkingway

Epoch: 37 | Train loss: 0.063 | Val loss: 0.174 | Gen: ethay airway onditiongcay isway orkingway

Epoch: 38 | Train loss: 0.053 | Val loss: 0.232 | Gen: ethay airway onditiongcay isway orkingway

Epoch: 39 | Train loss: 0.036 | Val loss: 0.183 | Gen: ethay airway onditionininingcay isway orkingway

Epoch: 40 | Train loss: 0.045 | Val loss: 0.207 | Gen: ethay airway ondititiongcay isway orkingway

Epoch: 41 | Train loss: 0.044 | Val loss: 0.332 | Gen: ethay airway onditionitcay isway orkingway

Epoch: 42 | Train loss: 0.044 | Val loss: 0.394 | Gen: ethay airway ondititititingcay isway orkingway

Epoch: 43 | Train loss: 0.063 | Val loss: 0.568 | Gen: ethay airway onditundiongcay isway orkingway

Epoch: 44 | Train loss: 0.079 | Val loss: 0.641 | Gen: ethay airway onditunditiongcay isway orkingway

Epoch: 45 | Train loss: 0.091 | Val loss: 0.346 | Gen: ethay airway onditionaingcay isway orkingway

Epoch: 46 | Train loss: 0.068 | Val loss: 0.465 | Gen: ethay airway ondititionanioningca isway orkingway

Epoch: 47 | Train loss: 0.068 | Val loss: 0.232 | Gen: ethay airway onditiningcay isway orkingway

Epoch: 48 | Train loss: 0.041 | Val loss: 0.241 | Gen: ehay airway onditioningcay isway orkingway

Epoch: 49 | Train loss: 0.037 | Val loss: 0.152 | Gen: ethay airway onditioniningcay isway orkingway

Epoch: 50 | Train loss: 0.028 | Val loss: 0.180 | Gen: ethay airway onditionioninibay isway orkingway

Epoch: 51 | Train loss: 0.022 | Val loss: 0.103 | Gen: ethay airway onditioningcay isway orkingway

Epoch: 52 | Train loss: 0.021 | Val loss: 0.096 | Gen: ethay airway onditioningcay isway orkingway

Epoch: 53 | Train loss: 0.022 | Val loss: 0.270 | Gen: ethay aiirway onditioniningcay isway irkingway

Epoch: 54 | Train loss: 0.081 | Val loss: 0.414 | Gen: ethay airway onditiningcay isway orkingway

Epoch: 55 | Train loss: 0.100 | Val loss: 0.320 | Gen: ethay airway ondititingcay isway orkingway

Epoch: 56 | Train loss: 0.067 | Val loss: 0.278 | Gen: ethay airway onditioniningcay isway orkingway

Epoch: 57 | Train loss: 0.046 | Val loss: 0.156 | Gen: ethay airway onditiongcay isway orkingway

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Epoch: 58 | Train loss: 0.036 | Val loss: 0.225 | Gen: ethay airway ondititiongcay isway orkingway
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Epoch: 59 | Train loss: 0.029 | Val loss: 0.128 | Gen: ethay airway onditioningcay isway orangway

Epoch: 60 | Train loss: 0.022 | Val loss: 0.147 | Gen: ethay airway ondititiongcay isway orkingway

Epoch: 61 | Train loss: 0.020 | Val loss: 0.111 | Gen: ethay airway onditioningcay isway orkingway

Epoch: 62 | Train loss: 0.019 | Val loss: 0.111 | Gen: ethay airway onditiongcay isway orkingway

Epoch: 63 | Train loss: 0.017 | Val loss: 0.219 | Gen: ethay airway ondititcay isway orkingway

Epoch: 64 | Train loss: 0.027 | Val loss: 0.134 | Gen: ethay airway ondititiongcay isway orkingway

Epoch: 65 | Train loss: 0.028 | Val loss: 0.343 | Gen: ethay airway ouditiongcay isway orkingway

Epoch: 66 | Train loss: 0.053 | Val loss: 0.115 | Gen: ethay airway onditiongcay isway orkingway

Epoch: 67 | Train loss: 0.015 | Val loss: 0.087 | Gen: ethay airway onditiongcay isway orkingway

Epoch: 68 | Train loss: 0.020 | Val loss: 0.300 | Gen: ethay airway onditiongcay isway orkingway

Epoch: 69 | Train loss: 0.045 | Val loss: 0.127 | Gen: ehay airway onditiongcay isway orkingway

Epoch: 70 | Train loss: 0.015 | Val loss: 0.100 | Gen: ethay airway onditioningcay isway orkingway

Epoch: 71 | Train loss: 0.013 | Val loss: 0.200 | Gen: ethay airway onditioningcay isway orkingway

Epoch: 72 | Train loss: 0.054 | Val loss: 0.234 | Gen: ethay airway onditiongcay isway orkingway

Epoch: 73 | Train loss: 0.036 | Val loss: 0.109 | Gen: ethay airway onditionionininigcay isway orkingway

Epoch: 74 | Train loss: 0.036 | Val loss: 0.253 | Gen: ethay airway onditioningcay isway orkingway

Epoch: 75 | Train loss: 0.069 | Val loss: 0.282 | Gen: ethay airway onditiongcay isway orkingway

Epoch: 76 | Train loss: 0.087 | Val loss: 0.270 | Gen: ethay airway onditiongcay isway orkingway

Epoch: 77 | Train loss: 0.088 | Val loss: 0.813 | Gen: ethay airway ondiondiongcay isway ororkingway

Epoch: 78 | Train loss: 0.138 | Val loss: 0.271 | Gen: ewhay airway onditiongcay isway orkingway

Epoch: 79 | Train loss: 0.050 | Val loss: 0.135 | Gen: ethay airway onditiongcay isway orkingway

Epoch: 80 | Train loss: 0.043 | Val loss: 0.194 | Gen: ethay airway onditiongcay isway orkingway

Epoch: 81 | Train loss: 0.024 | Val loss: 0.078 | Gen: ethay airway onditiongcay isway orkingway

Epoch: 82 | Train loss: 0.018 | Val loss: 0.171 | Gen: ethay airway onditiningcay isway orkingway

Epoch: 83 | Train loss: 0.019 | Val loss: 0.066 | Gen: ethay airway onditioningcay isway orkingway

Epoch: 84 | Train loss: 0.012 | Val loss: 0.060 | Gen: ethay airway onditiongcay isway orkingway

Epoch: 85 | Train loss: 0.007 | Val loss: 0.067 | Gen: ethay airway onditiongcay isway orkingway

Epoch: 86 | Train loss: 0.005 | Val loss: 0.062 | Gen: ethay airway onditioningcay isway orkingway

Epoch: 87 | Train loss: 0.004 | Val loss: 0.065 | Gen: ethay airway onditioningcay isway orkingway

Epoch: 88 | Train loss: 0.003 | Val loss: 0.065 | Gen: ethay airway onditioningcay isway orkingway

Epoch: 89 | Train loss: 0.003 | Val loss: 0.070 | Gen: ethay airway onditioningcay isway orkingway

Epoch: 90 | Train loss: 0.004 | Val loss: 0.073 | Gen: ethay airway onditioningcay isway orkingway

Epoch: 91 | Train loss: 0.007 | Val loss: 0.102 | Gen: ethay airway onditioningcay isway orkingway

Epoch: 92 | Train loss: 0.009 | Val loss: 0.078 | Gen: ethay airway onditioningcay isway orkingway

Epoch: 93 | Train loss: 0.005 | Val loss: 0.074 | Gen: ethay airway onditioningcay isway orkingway

Epoch: 94 | Train loss: 0.003 | Val loss: 0.078 | Gen: ethay airway onditioningcay isway orkingway

Epoch: 95 | Train loss: 0.002 | Val loss: 0.082 | Gen: ethay airway onditioningcay isway orkingway

Epoch: 96 | Train loss: 0.003 | Val loss: 0.097 | Gen: ethay airway onditioningcay isway orkingway

Epoch: 97 | Train loss: 0.005 | Val loss: 0.110 | Gen: ethay airway onditioningcay isway orkingway

Epoch: 98 | Train loss: 0.007 | Val loss: 0.085 | Gen: ethay airway onditioniongcay isway orkingway

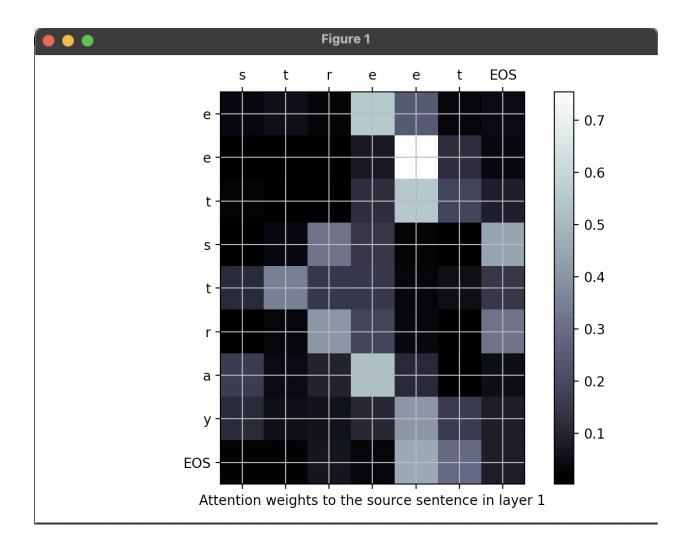
Epoch: 99 | Train loss: 0.009 | Val loss: 0.215 | Gen: ethay airway onditiongcay isway orkingway

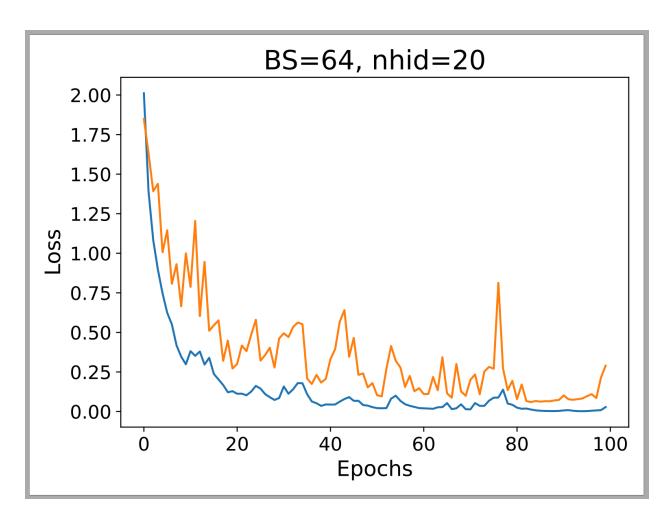
Epoch: 100 | Train loss: 0.028 | Val loss: 0.290 | Gen: ethay airway onditiongcay isway orkingway

source: the air conditioning is working

translated: ethay airway onditiongcay isway orkingway

Failure - wrong translation for "conditioning" - was correct until the final 3 epochs, suggesting overfitting. It correctly translated the word "street" though.





## Second run:

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## Opts

\_\_\_\_\_

cuda: 0 nepochs: 100

checkpoint\_dir: checkpoints

learning\_rate: 0.005 lr\_decay: 0.99 batch\_size: 64 hidden\_size: 20

decoder\_type: transformer

num\_transformer\_layers: 3

\_\_\_\_\_

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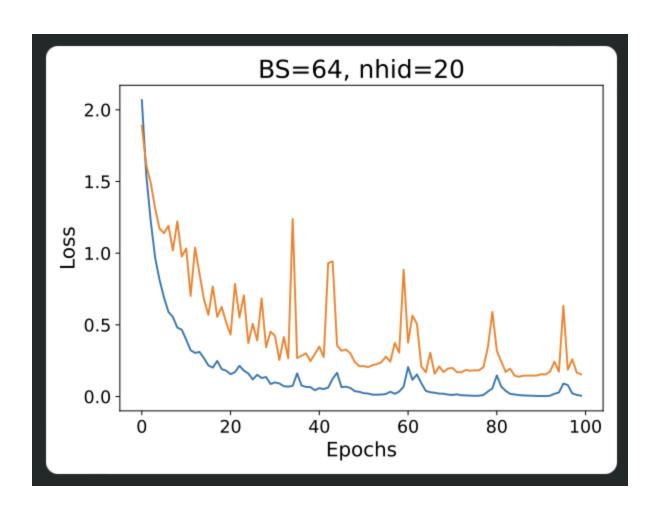
**Data Stats** ('firm', 'irmfay') ('appointed', 'appointedway') ('merely', 'erelymay') ('shook', 'ookshay') ('wishing', 'ishingway') Num unique word pairs: 6387 Vocabulary: dict\_keys(['-', 'a', 'b', 'c', 'd', 'e', 'f', 'g', 'h', 'i', 'j', 'k', 'l', 'm', 'n', 'o', 'p', 'q', 'r', 's', 't', 'u', 'v', 'w', 'x', 'y', 'z', 'SOS', 'EOS']) Vocab size: 29 \_\_\_\_\_\_ ======= Epoch: 1 | Train loss: 2.068 | Val loss: 1.889 | Gen: onsinsinay-inay-inay ontontontontonton eav elllelelelelelele ancav Epoch: 2 | Train loss: 1.548 | Val loss: 1.615 | Gen: inway onay esay-estay-eshay-esh elllllayrayrayrayra ay Epoch: 3 | Train loss: 1.226 | Val loss: 1.492 | Gen: imimimpncmimimimimim onway estaytaytaytaytay eay ampay Epoch: 4 | Train loss: 0.969 | Val loss: 1.312 | Gen: impnway onay eay eallllray ampamay Epoch: 5 | Train loss: 0.813 | Val loss: 1.171 | Gen: iknikniknikniknay onay ehay eallllway ampanay Epoch: 6 | Train loss: 0.690 | Val loss: 1.140 | Gen: ixnimnimnay onwaynaynaynaynay ehayhethayhayhayh ealllay amelay Epoch: 7 | Train loss: 0.590 | Val loss: 1.191 | Gen: ixidpimimimidpimimim onway ehay ealwlay amelay Epoch: 8 | Train loss: 0.555 | Val loss: 1.019 | Gen: ixnay onway ethay-ethay ealway amenay Epoch: 9 | Train loss: 0.481 | Val loss: 1.222 | Gen: iknay onwny ehay ealway amenay Epoch: 10 | Train loss: 0.466 | Val loss: 0.977 | Gen: ixnaypay onway ethayhayhay ealwaypray amepaynaynaynayna Epoch: 11 | Train loss: 0.396 | Val loss: 1.033 | Gen: ixnay onway ehay ealray amenay Epoch: 12 | Train loss: 0.323 | Val loss: 0.701 | Gen: ixnay onway-onway ethay ealhalfray amewameway Epoch: 13 | Train loss: 0.304 | Val loss: 1.040 | Gen: ixnay onay-onway ehayeway ealray amenamenay Epoch: 14 | Train loss: 0.311 | Val loss: 0.857 | Gen: ixwnay onway ehaythay ealray amemaway Epoch: 15 | Train loss: 0.267 | Val loss: 0.677 | Gen: ixnay onway ethay ealray amenayeway Epoch: 16 | Train loss: 0.218 | Val loss: 0.569 | Gen: ixnay ononway ethay ealray amenamenay Epoch: 17 | Train loss: 0.201 | Val loss: 0.768 | Gen: ixway onway ehay ealray amay Epoch: 18 | Train loss: 0.248 | Val loss: 0.556 | Gen: ixnay onway ethay ealray amenamenay Epoch: 19 | Train loss: 0.192 | Val loss: 0.625 | Gen: ixway onway-onay ethay ealray amemamefay Epoch: 20 | Train loss: 0.180 | Val loss: 0.517 | Gen: ixnay onway ethay eallray amenay

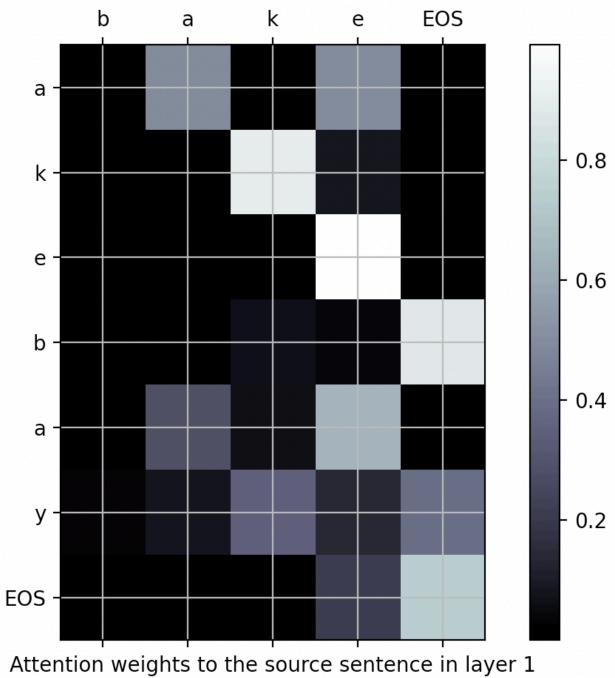
Epoch: 21 | Train loss: 0.156 | Val loss: 0.431 | Gen: ixnay onway ethay ealray amefenay

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Epoch: 22 | Train loss: 0.171 | Val loss: 0.785 | Gen: ixnay onway ethayethay ealrayeay
amemaumepay
Epoch: 23 | Train loss: 0.214 | Val loss: 0.553 | Gen: ixnay onway ethay ealray amenay
Epoch: 24 | Train loss: 0.181 | Val loss: 0.705 | Gen: ixnay onway eythay ealray namenay
Epoch: 25 | Train loss: 0.161 | Val loss: 0.372 | Gen: ixnay onway ethay ealray amepay
Epoch: 26 | Train loss: 0.119 | Val loss: 0.507 | Gen: ixnay onway ethay ealray amenay
Epoch: 27 | Train loss: 0.151 | Val loss: 0.391 | Gen: ixnay onway ehay ealray amenay
Epoch: 28 | Train loss: 0.129 | Val loss: 0.683 | Gen: ixnay onway ethay ealray amenay
Epoch: 29 | Train loss: 0.136 | Val loss: 0.344 | Gen: ixnay onway ethay ealray ameway
Epoch: 30 | Train loss: 0.088 | Val loss: 0.452 | Gen: ixnay onway ethay ealray ameway
Epoch: 31 | Train loss: 0.098 | Val loss: 0.424 | Gen: ixnay onway ethay ealray amenay
Epoch: 32 | Train loss: 0.091 | Val loss: 0.255 | Gen: ixnay onway ethay ealray ameway
Epoch: 33 | Train loss: 0.073 | Val loss: 0.415 | Gen: ixnay oway ehay ealray amenay
Epoch: 34 | Train loss: 0.069 | Val loss: 0.267 | Gen: ixnay onway ethay ealray amenay
Epoch: 35 | Train loss: 0.074 | Val loss: 1.239 | Gen: zcnizay onway eay eaaawray mamenay
Epoch: 36 | Train loss: 0.161 | Val loss: 0.268 | Gen: ixnay onay ethay ealray amenay
Epoch: 37 | Train loss: 0.077 | Val loss: 0.285 | Gen: ixnay onway ethay ealray amenay
Epoch: 38 | Train loss: 0.067 | Val loss: 0.301 | Gen: ixnay onway ethay ealray amenay
Epoch: 39 | Train loss: 0.066 | Val loss: 0.246 | Gen: ixnay onway ethay ealray amenay
Epoch: 40 | Train loss: 0.043 | Val loss: 0.297 | Gen: ixnay onway ethay ealray amenay
Epoch: 41 | Train loss: 0.059 | Val loss: 0.348 | Gen: ixnay onway ethay ealray amenay
Epoch: 42 | Train loss: 0.052 | Val loss: 0.275 | Gen: ixnay onway ethay ealray amenay
Epoch: 43 | Train loss: 0.063 | Val loss: 0.930 | Gen: ixnay onway ehay ealray amenay
Epoch: 44 | Train loss: 0.124 | Val loss: 0.943 | Gen: ixnay nway ethay eallllwray amemennay
Epoch: 45 | Train loss: 0.165 | Val loss: 0.355 | Gen: ixnay onay ehay ealray amenay
Epoch: 46 | Train loss: 0.066 | Val loss: 0.319 | Gen: ixnay onway ehay ealray amenay
Epoch: 47 | Train loss: 0.069 | Val loss: 0.328 | Gen: ixnay onway ehay ealray amenay
Epoch: 48 | Train loss: 0.060 | Val loss: 0.301 | Gen: ixnay onway ethay ealray amenay
Epoch: 49 | Train loss: 0.037 | Val loss: 0.240 | Gen: ixnay onway ehay ealray amenay
Epoch: 50 | Train loss: 0.033 | Val loss: 0.212 | Gen: ixnay onway ethay ealray amenay
Epoch: 51 | Train loss: 0.023 | Val loss: 0.212 | Gen: ixnay onway ehay ealray amenay
Epoch: 52 | Train loss: 0.021 | Val loss: 0.206 | Gen: ixnay onway ethay ealray amenay
Epoch: 53 | Train loss: 0.013 | Val loss: 0.219 | Gen: ixnay onway ethay ealray amenay
Epoch: 54 | Train loss: 0.013 | Val loss: 0.226 | Gen: ixnay onway ethay ealray amenay
Epoch: 55 | Train loss: 0.014 | Val loss: 0.240 | Gen: ixnay onway ethay ealray amenay
Epoch: 56 | Train loss: 0.017 | Val loss: 0.278 | Gen: ixnay onway ethay ealray amenay
Epoch: 57 | Train loss: 0.033 | Val loss: 0.243 | Gen: ixnay onway ethay ealray amenay
Epoch: 58 | Train loss: 0.019 | Val loss: 0.373 | Gen: ixnay onway ethay ealray amenay
Epoch: 59 | Train loss: 0.035 | Val loss: 0.306 | Gen: ixnay onway ethay ealray amenay
Epoch: 60 | Train loss: 0.069 | Val loss: 0.884 | Gen: ixnay onway ethay ealwray amenay
Epoch: 61 | Train loss: 0.205 | Val loss: 0.376 | Gen: ixnay onway ethay ealray amenay
Epoch: 62 | Train loss: 0.117 | Val loss: 0.564 | Gen: ixnay onway ehaythay ealray amenay
Epoch: 63 | Train loss: 0.154 | Val loss: 0.507 | Gen: ixnay onway ethay ealray amenay
Epoch: 64 | Train loss: 0.092 | Val loss: 0.209 | Gen: ixnay onway ehay ealray amenay
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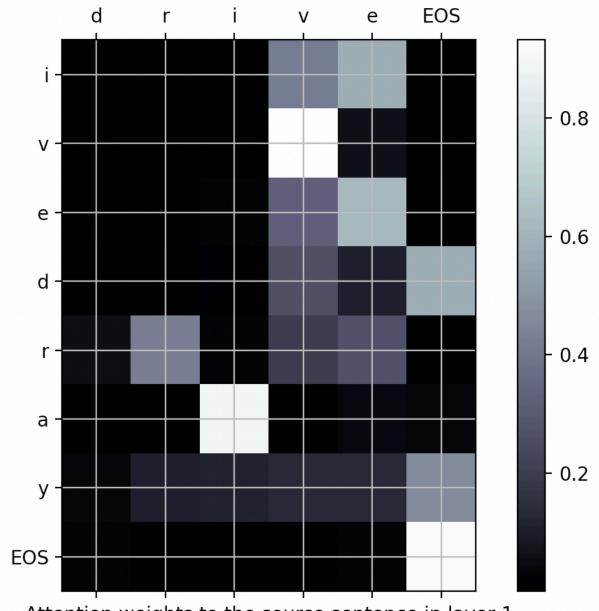
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Epoch: 65 | Train loss: 0.039 | Val loss: 0.169 | Gen: ixnav onway ethay ealray amenay
Epoch: 66 | Train loss: 0.030 | Val loss: 0.306 | Gen: ixnay onway ethay ealray amenay
Epoch: 67 | Train loss: 0.027 | Val loss: 0.158 | Gen: ixnay onway ethay ealray amenay
Epoch: 68 | Train loss: 0.021 | Val loss: 0.210 | Gen: ixnay onway ethay ealray amenay
Epoch: 69 | Train loss: 0.019 | Val loss: 0.171 | Gen: ixnay onway ethay ealray amenay
Epoch: 70 | Train loss: 0.013 | Val loss: 0.195 | Gen: ixnay onway ethay ealray amenay
Epoch: 71 | Train loss: 0.011 | Val loss: 0.200 | Gen: ixnay onway ethay ealray amenay
Epoch: 72 | Train loss: 0.015 | Val loss: 0.170 | Gen: ixnay onway ethay ealray amenay
Epoch: 73 | Train loss: 0.009 | Val loss: 0.169 | Gen: ixnay onway ethay ealray amenay
Epoch: 74 | Train loss: 0.008 | Val loss: 0.185 | Gen: ixnay onway ethay ealray amenay
Epoch: 75 | Train loss: 0.006 | Val loss: 0.180 | Gen: ixnay onway ethay ealray amenay
Epoch: 76 | Train loss: 0.005 | Val loss: 0.182 | Gen: ixnay onway ethay ealray amenay
Epoch: 77 | Train loss: 0.006 | Val loss: 0.183 | Gen: ixnay onway ethay ealray amenay
Epoch: 78 | Train loss: 0.011 | Val loss: 0.205 | Gen: ixnay onway ethay ealray amenay
Epoch: 79 | Train loss: 0.035 | Val loss: 0.346 | Gen: ixnay onway ethay eewray emenay
Epoch: 80 | Train loss: 0.057 | Val loss: 0.590 | Gen: ivnay onway ethay ealray away
Epoch: 81 | Train loss: 0.147 | Val loss: 0.321 | Gen: ixnay onway ethay ealray amenay
Epoch: 82 | Train loss: 0.069 | Val loss: 0.244 | Gen: ixnay onway ethay ealray ayenay
Epoch: 83 | Train loss: 0.040 | Val loss: 0.172 | Gen: ixnay onway ethay ealray amenay
Epoch: 84 | Train loss: 0.019 | Val loss: 0.194 | Gen: ixnay onway ethay ealray amenay
Epoch: 85 | Train loss: 0.014 | Val loss: 0.146 | Gen: ixnay onway ethay ealray amenay
Epoch: 86 | Train loss: 0.010 | Val loss: 0.138 | Gen: ixnay onway ethay ealray amenay
Epoch: 87 | Train loss: 0.008 | Val loss: 0.145 | Gen: ixnay onway ethay ealray amenay
Epoch: 88 | Train loss: 0.006 | Val loss: 0.146 | Gen: ixnay onway ethay ealray amenay
Epoch: 89 | Train loss: 0.005 | Val loss: 0.146 | Gen: ixnay onway ethay ealray amenay
Epoch: 90 | Train loss: 0.004 | Val loss: 0.146 | Gen: ixnay onway ethay ealray amenay
Epoch: 91 | Train loss: 0.004 | Val loss: 0.156 | Gen: ixnay onway ethay ealray amenay
Epoch: 92 | Train loss: 0.003 | Val loss: 0.154 | Gen: ixnay onway ethay ealray amenay
Epoch: 93 | Train loss: 0.005 | Val loss: 0.174 | Gen: ixnay onway ethay ealray amenay
Epoch: 94 | Train loss: 0.019 | Val loss: 0.243 | Gen: ixnay onway ethay ealray amenay
Epoch: 95 | Train loss: 0.028 | Val loss: 0.173 | Gen: ixnay onway ethay ealray amenay
Epoch: 96 | Train loss: 0.090 | Val loss: 0.632 | Gen: ixnay onway ethay ealwray amenay
Epoch: 97 | Train loss: 0.080 | Val loss: 0.187 | Gen: ixnay onway ethay ealray amenay
Epoch: 98 | Train loss: 0.022 | Val loss: 0.260 | Gen: ixnay onway ethay ealray amenamenay
Epoch: 99 | Train loss: 0.011 | Val loss: 0.168 | Gen: ixnay onway ethay ealray amenay
Epoch: 100 | Train loss: 0.006 | Val loss: 0.155 | Gen: ixnay onway ethay ealray amenay
source:
            nix on the real name
             ixnay onway ethay ealray amenay
translated:
```

Success: both the sentence and the word "bake"



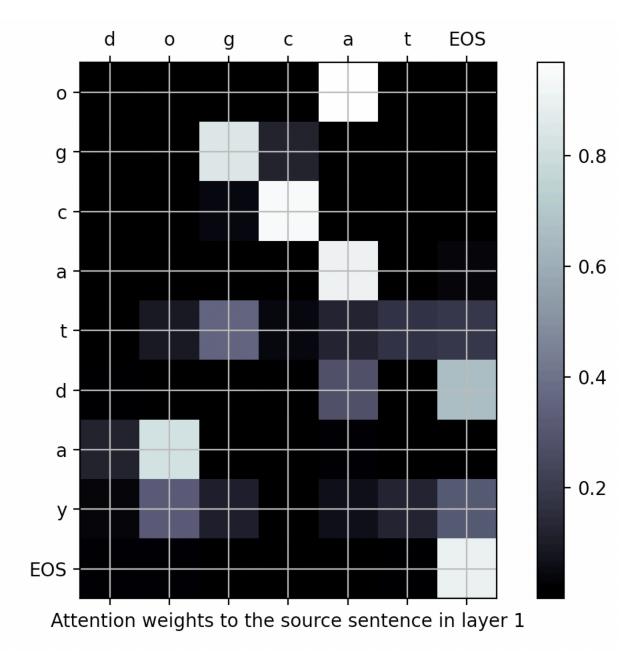


More successes: drive, dogcat (made up word not in training data)

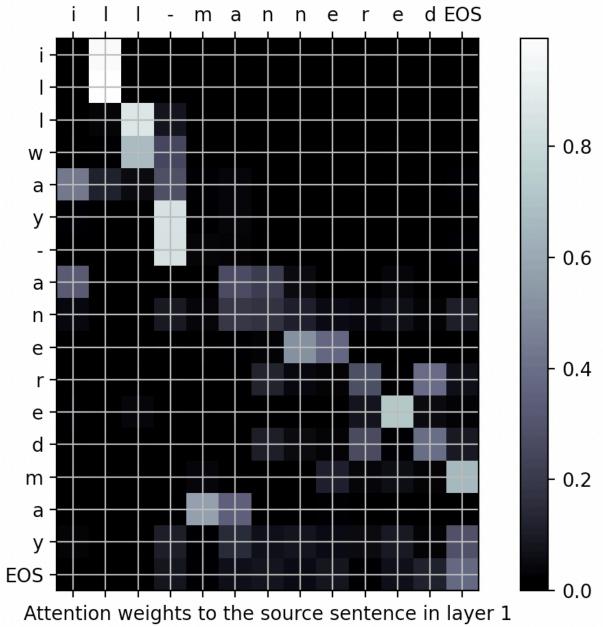


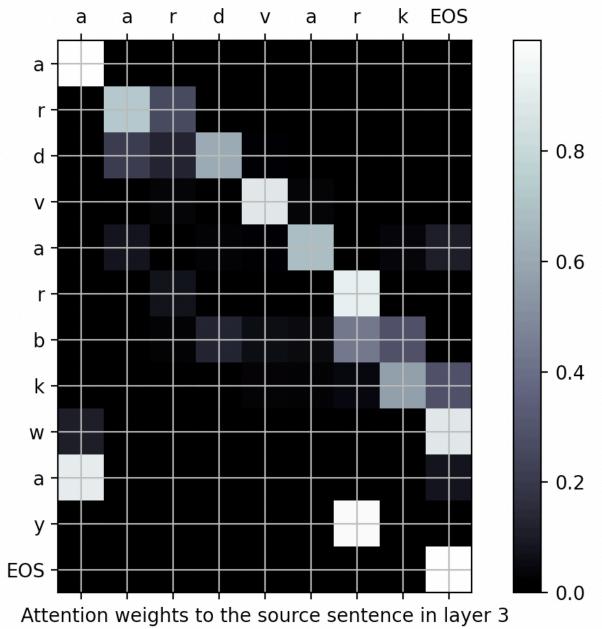
Attention weights to the source sentence in layer 1

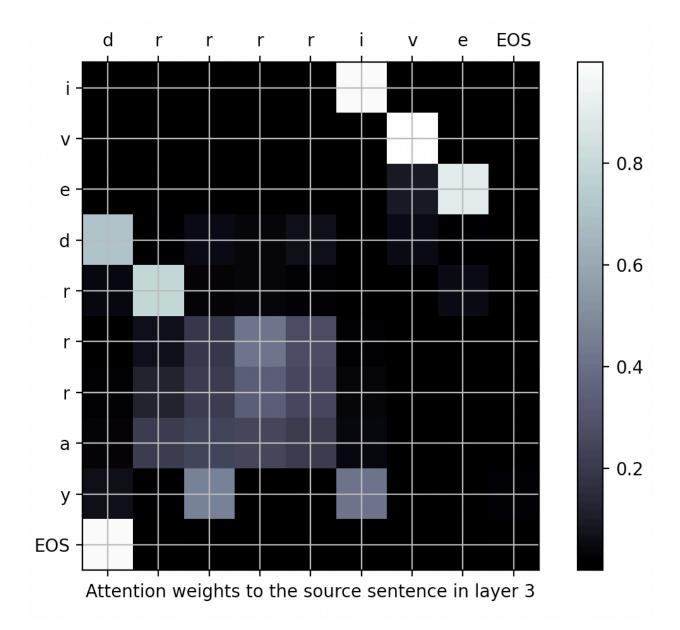


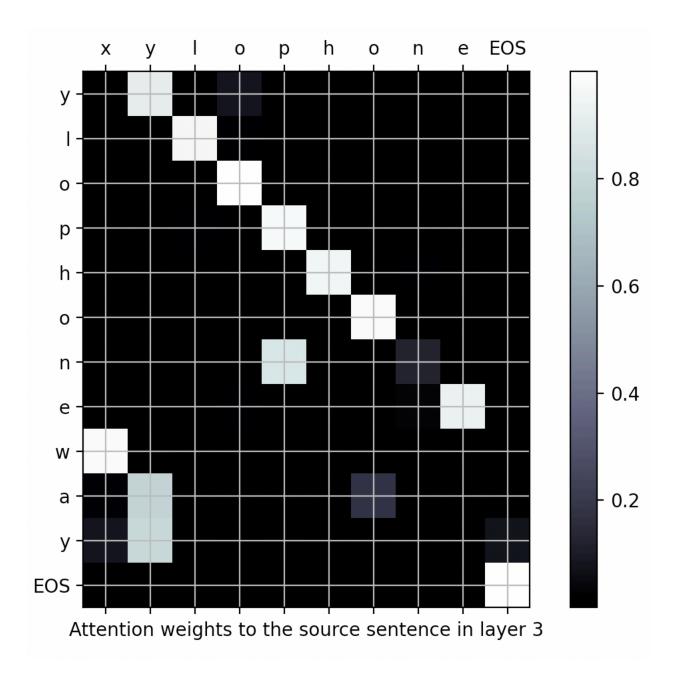


Failure: aardvark, ill-mannered (very close, missing one n), xylophone (real word but rarer letter combo), drrrrive (toy word, 4 rs, missing one)









Hypotheses for success and failures:

## Successes:

- street: Very common word, simple to translate
- bake: Starts with consonant, then follows a basic pattern
- drive: Same as above, starts with simple consonant pattern
- dogcat: Builds patterns from common words "dog" and "cat", attends well

## Failures:

- aardvark: Rare letter combination of aard, causing uncertainty
- ill-mannered: Gets most translation right, fails on extra n due to length
- xylophone: very unusual starting consonant, perhaps outside training vocabulary
- drrrrive: Fails to add that 4th r properly, repetition confuses attention