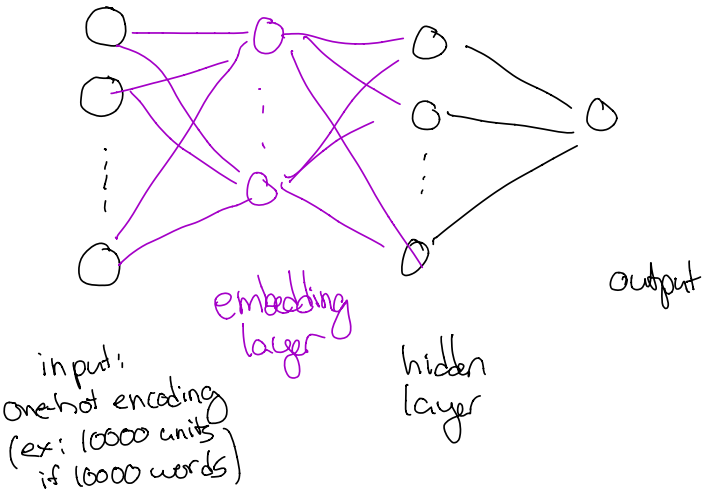
Goal: Use an embedding matrix to convert a one-hot encoding to an embedding

This is a weight matrix for a layer in a N.N.



Suppose $O^{(i)<t>}$ is one hot encoding of a word

(a column vector of length 10000)

Embedding layer gives us $e^{(i)<t>} = (W^{[1]})^T O^{(i)<t>}$

↖ suppose a column vector of length 50

- Just like usual, but:
  - no bias
  - no activation (linear activation)

What is the shape of $W^{[1]}$?

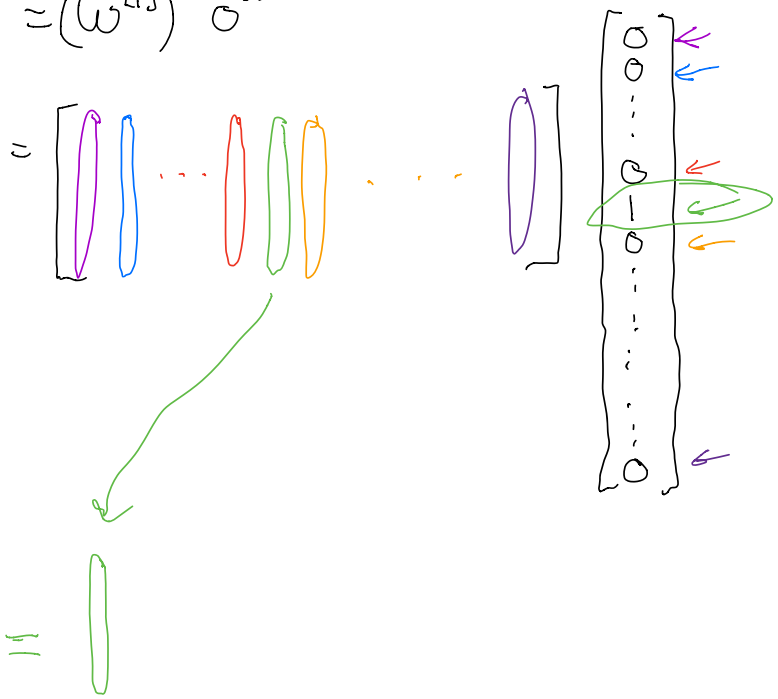
(10000, 50)

↖ # units in prev. layer

↖ # units in this layer

$(W^{[1]})^T$ shape (50, 10000)

$$e^{(i)\langle t \rangle} = \left(w^{[1]}\right)^T o^{(i)\langle t \rangle}$$



Each column of $\left(w^{[1]}\right)^T$ is the embedding for one word.

Each row of $w^{[1]}$ is embedding of one word.