NLP_Study_Team_1

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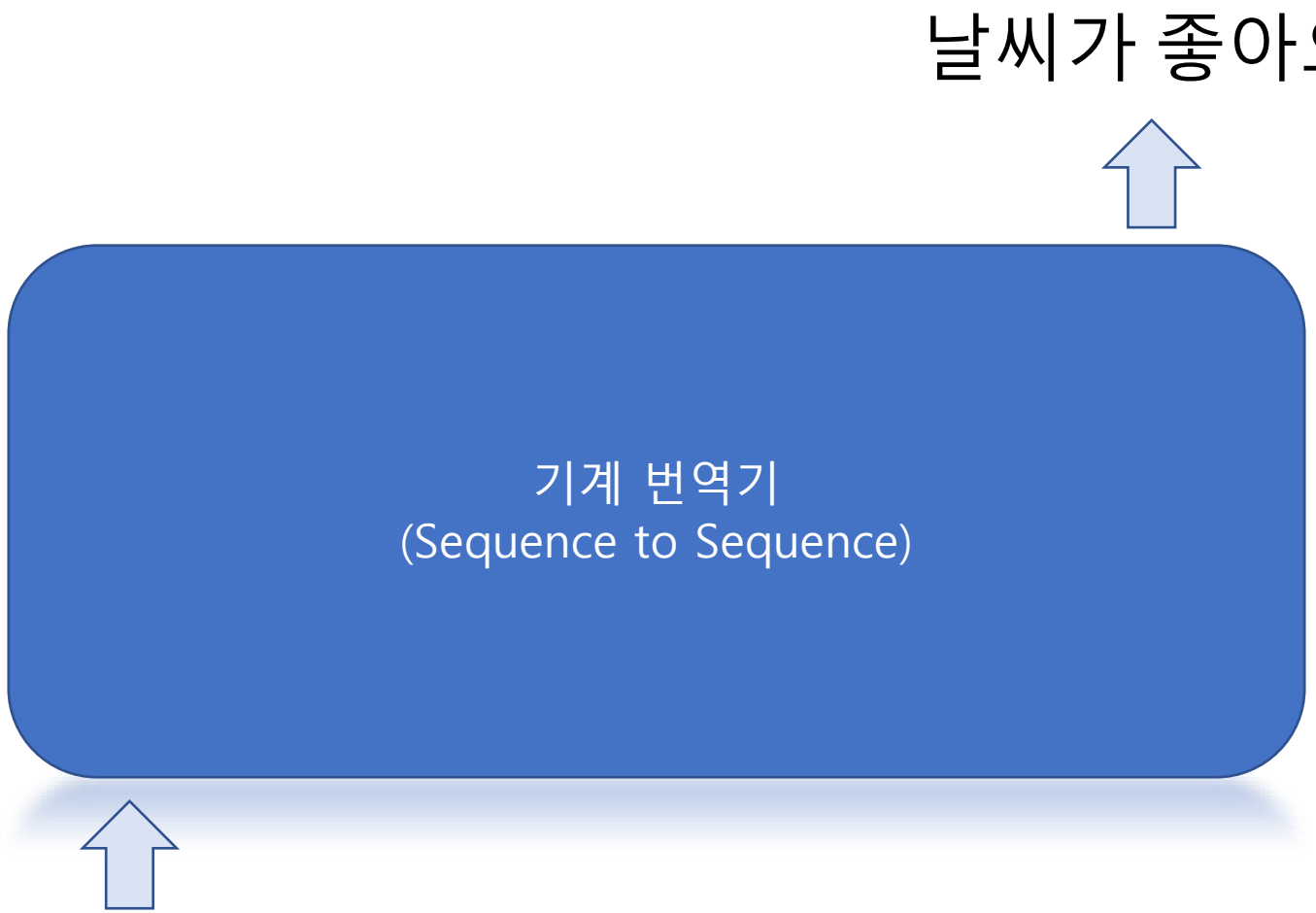
SEQ2SEQ

Encoder - Decoder (인코더-디코더)



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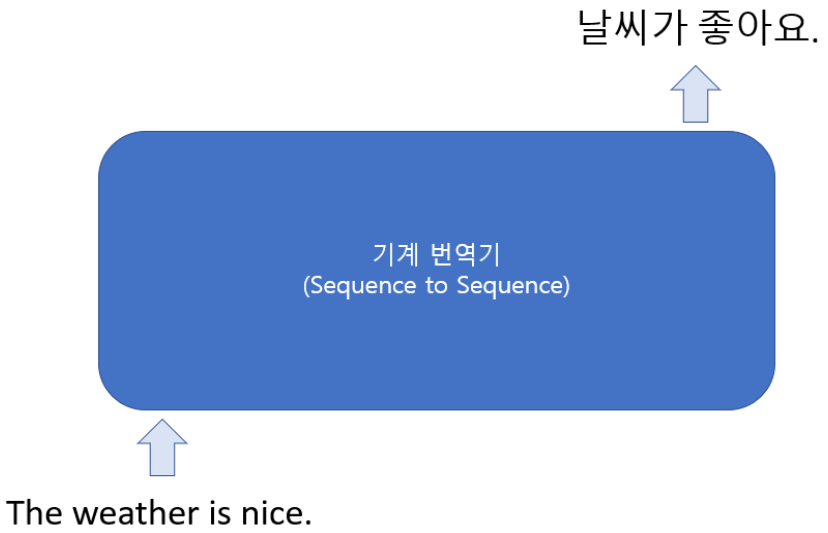
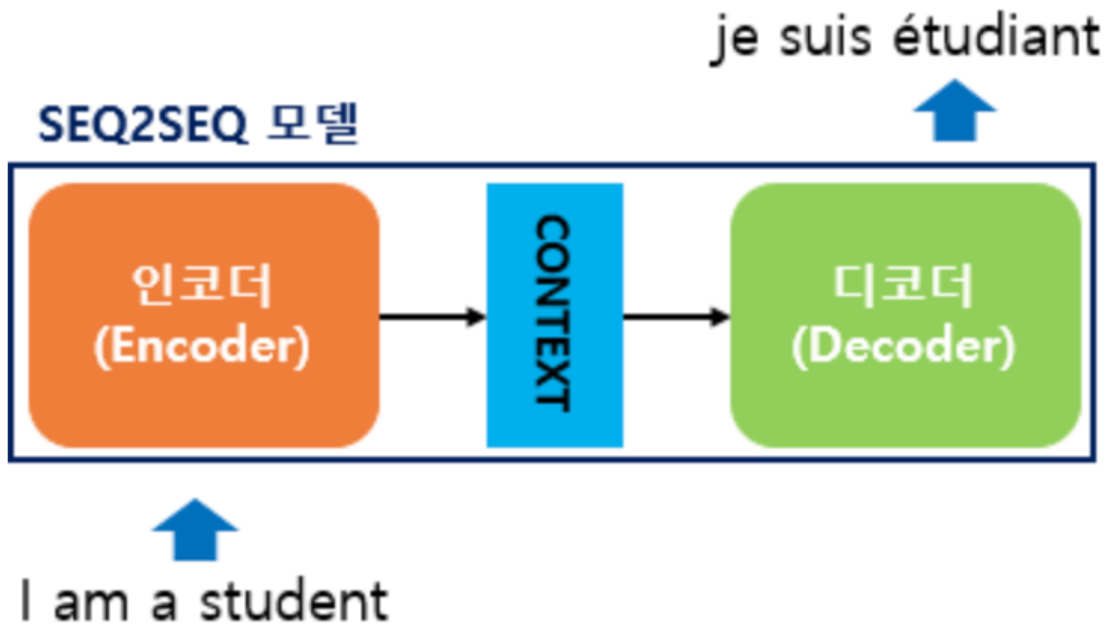
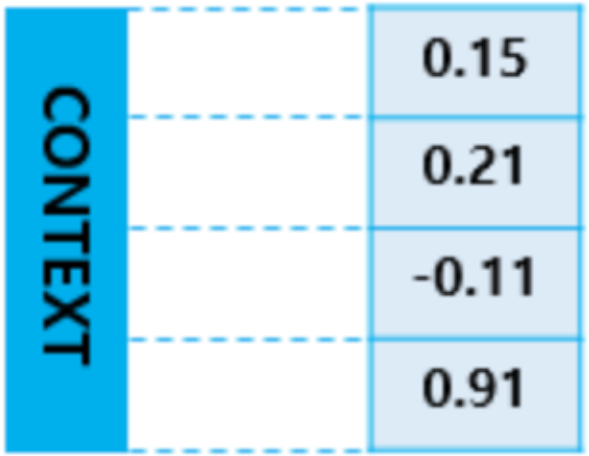


Sequence-to-sequence는 입력된 시퀀스로부터 다른 도메인의 시퀀스를 출력하는 다양한 분야에서 사용되는 모델이다.

Encoder - Decoder (인코더-디코더)





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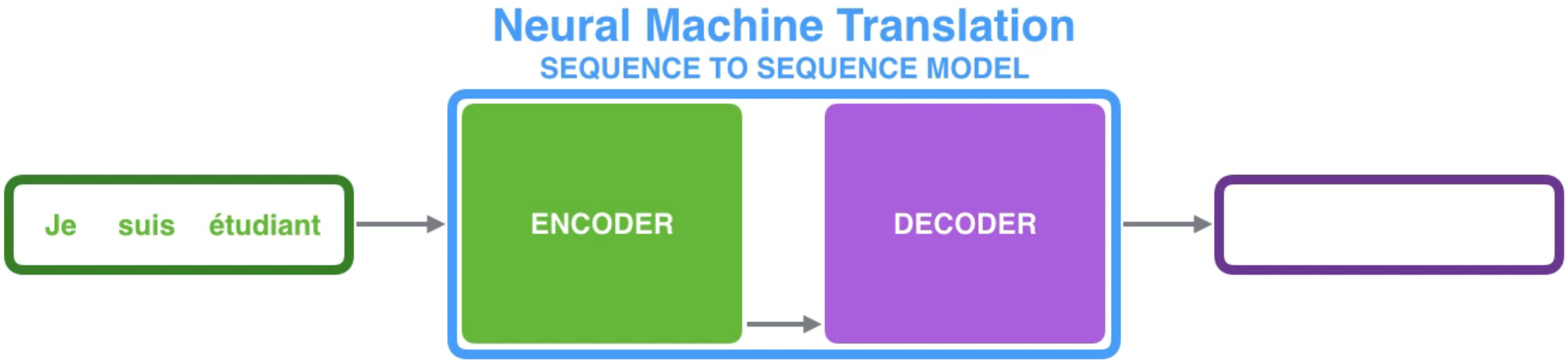


참고 문헌: https://jalammar.github.io/visualizing-neural-machine-translation-mechanics-of-seq2seq-models-with-attention/

Encoder - Decoder (인코더-디코더)

Encoder
:

$$h_t = f_{enc}(x_t, h_{t-1})$$

CONTEXT:

$$c = g(h_{1:T_x})$$

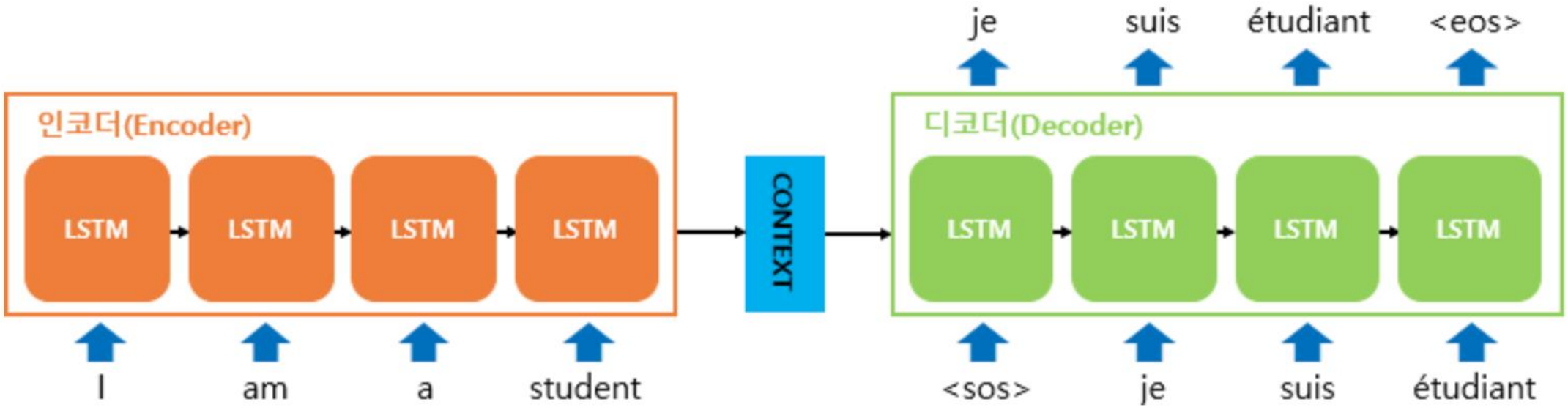
Decoder:

$$h_t = f_{dec}(y_{t-1}, s_{t-1}, c)$$

$$P(y_t | y_{1:t-1}, c) = \text{softmax}(W_s h_t + b_s)$$

설명: https://colab.research.google.com/drive/1QaAKHyNsEPPzPK8gq544HUj_Kp3p8TjR?usp=sharing

Encoder - Decoder (인코더-디코더)



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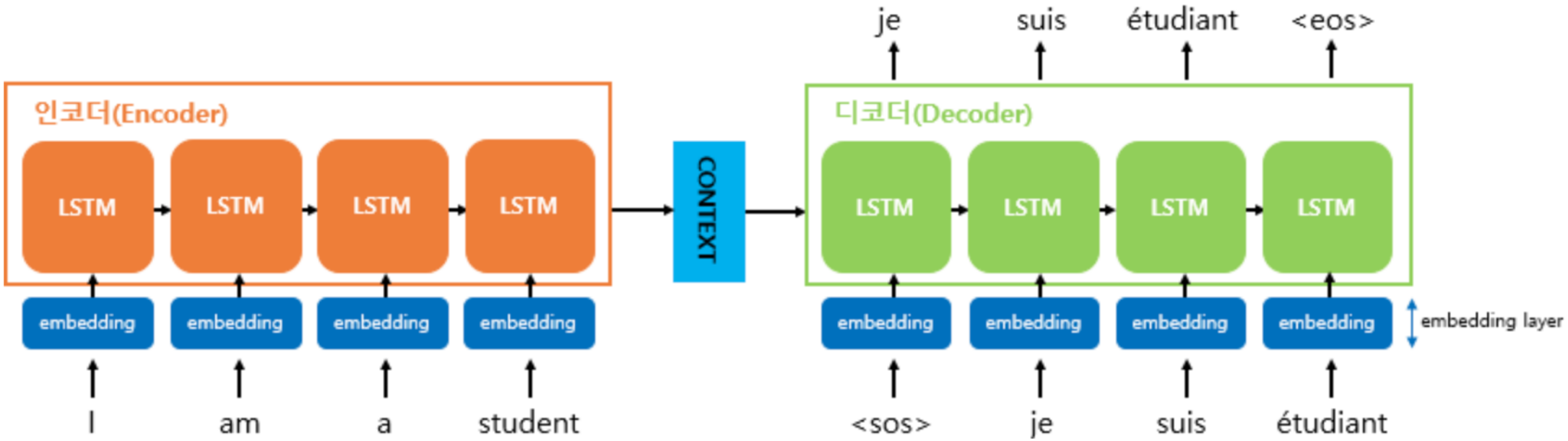

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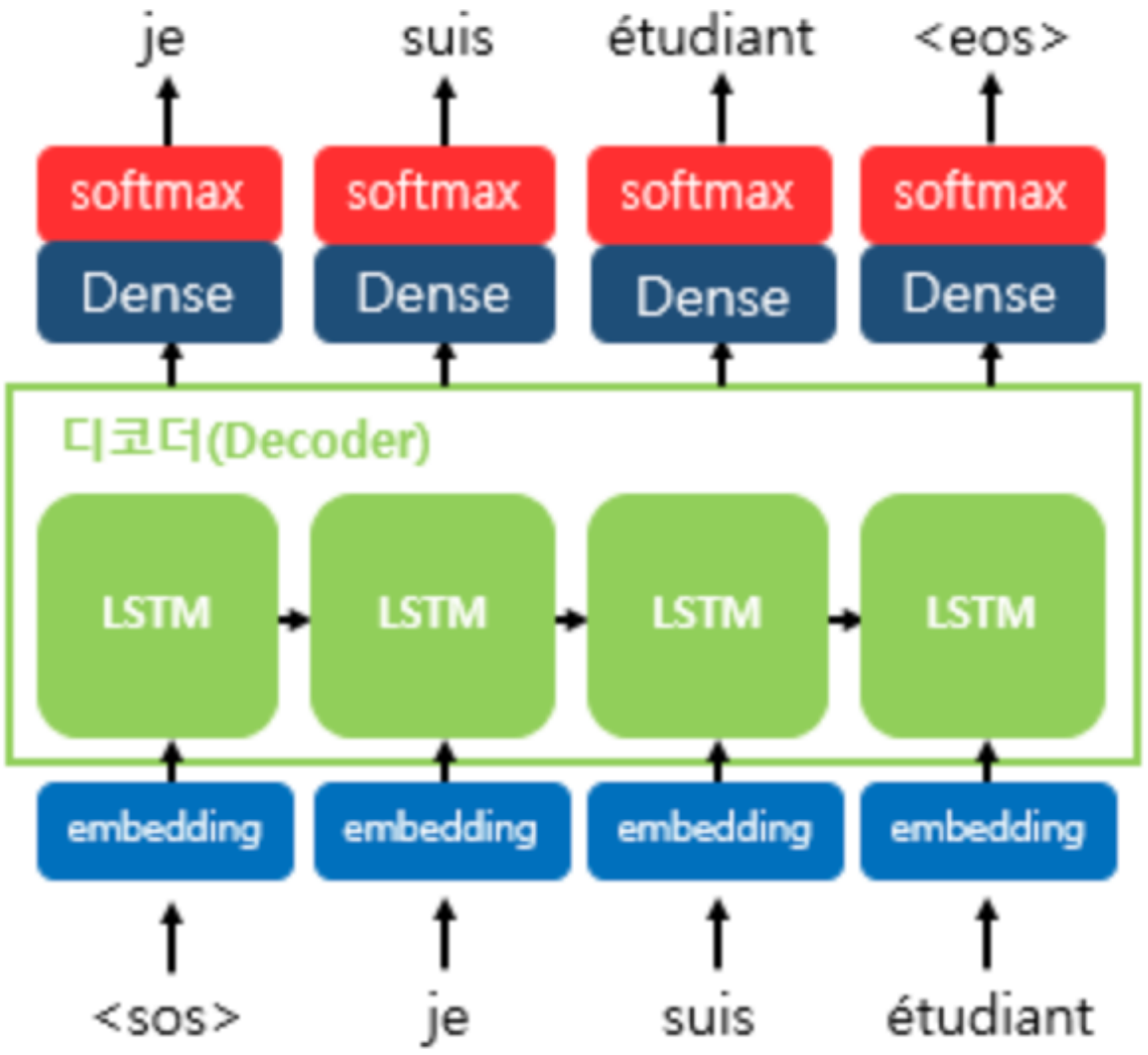

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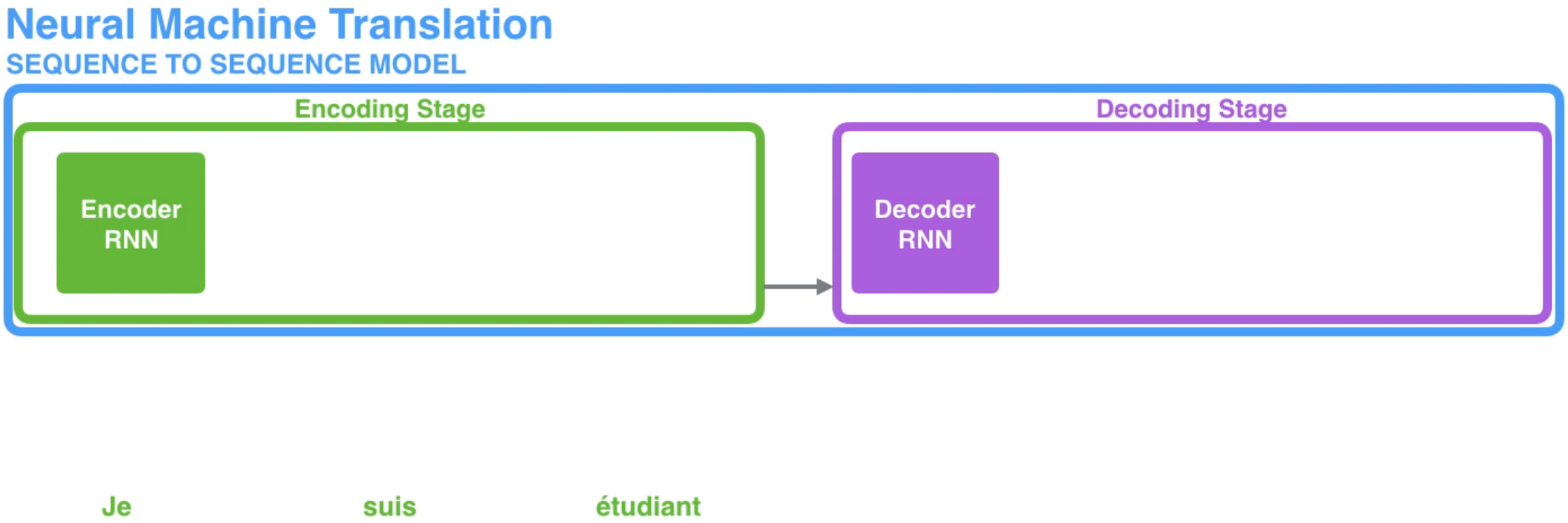

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Attention

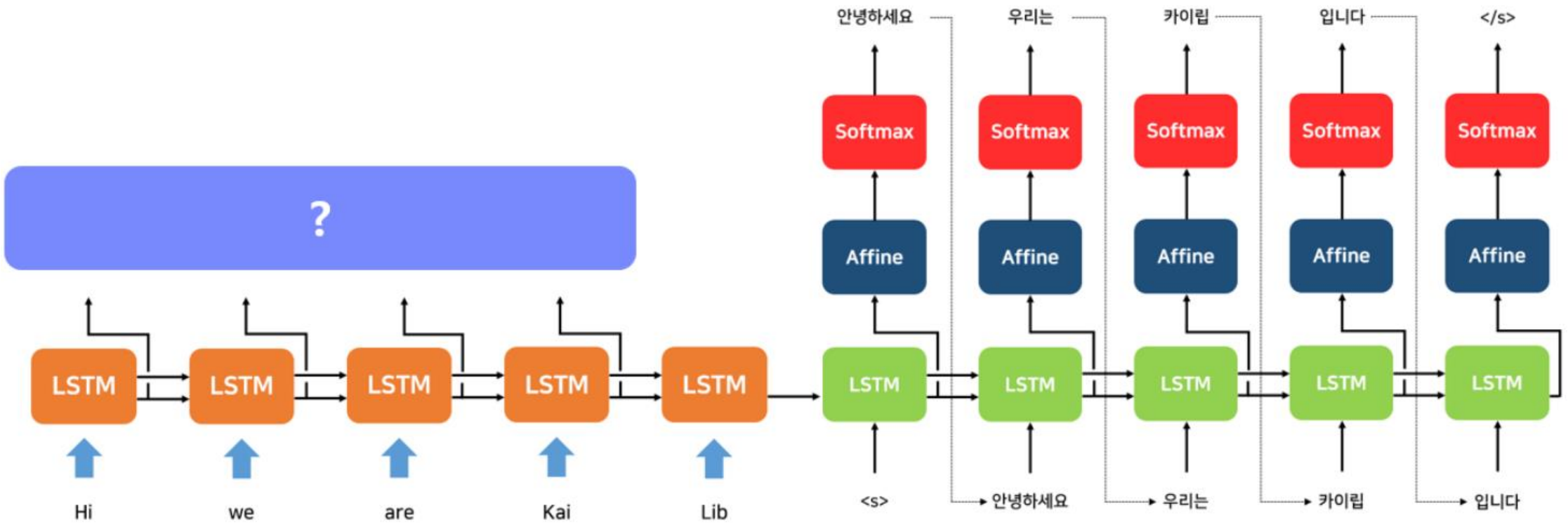
Seq2seq의 한계

1. 입력 시퀀스의 길이에 상관없이, 항상 고정된 크기의 벡터에 모든 정보를 압축하기 때문에 이 과정에서 정보 손실이 발생한다. (bottleneck으로 작용)

2. 입력 시퀀스의 길이가 길어지면 RNN에서 발생된 기울기 소실(vanising gradient) 문제가 여전히 존재한다.

-> seq2seq의 문제점을 보완하기 위해 Attention Mechanism(어텐션 메커니즘)이 제안

Seq2seq의 문제점

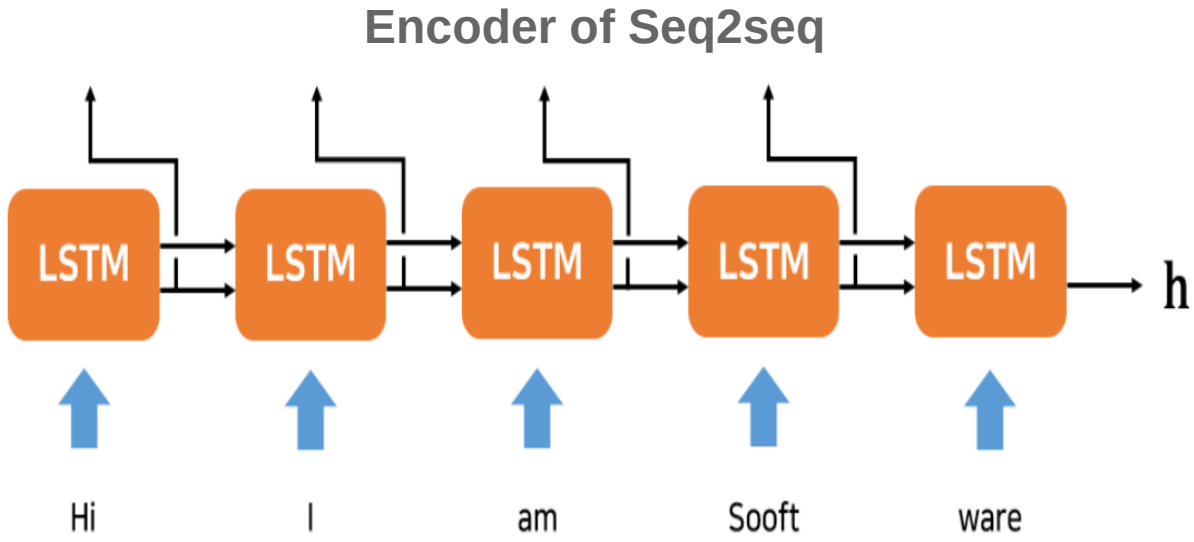


Attention의 직관적인 설명

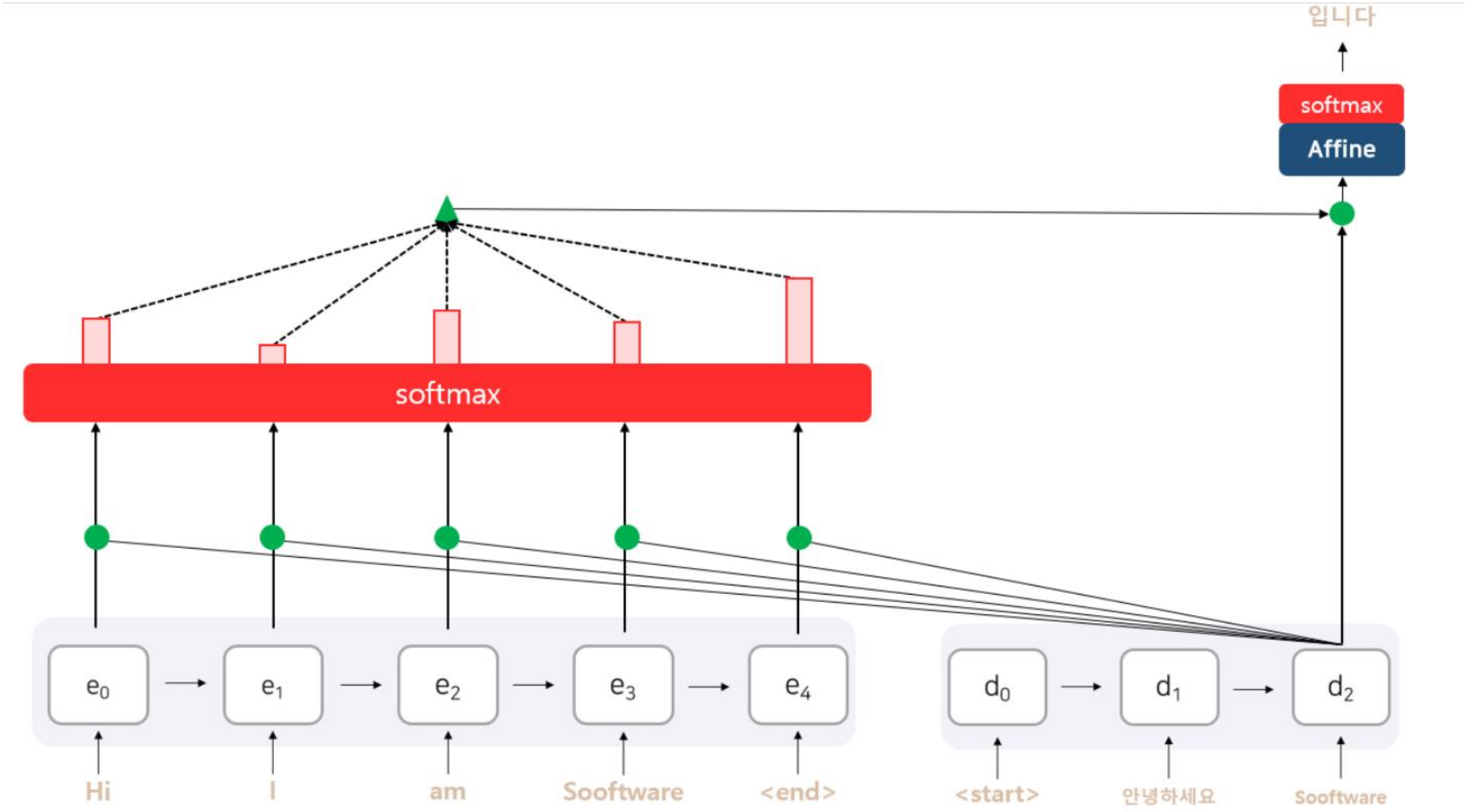
35. Mathematics will attract those it can attract, but it will do nothing to overcome resistance to science. Science is universal in principle but in practice it speaks to very few. Mathematics may be considered a communication skill of the highest type, frictionless so to speak; and at the opposite pole from mathematics, the fruits of science show the practical benefits of science without the use of words. But those fruits are ambivalent. Science as science does not *speak*; ideally, all scientific concepts are mathematized when scientists communicate with one another, and when science displays its products to non-scientists it need not, and indeed is not able to, resort to salesmanship. When science speaks to others, it is no longer science, and the scientist becomes or has to hire a publicist who dilutes the exactness of mathematics. In doing so, the scientist reverses his drive toward mathematical exactness in favor of rhetorical vagueness and metaphor, thus _____. [3점]

① degrading his ability to use the scientific language needed for good salesmanship
② surmounting the barrier to science by associating science with mathematics
③ inevitably making others who are unskillful in mathematics hostile to science
④ neglecting his duty of bridging the gap between science and the public
⑤ violating the code of intellectual conduct that defines him as a scientist

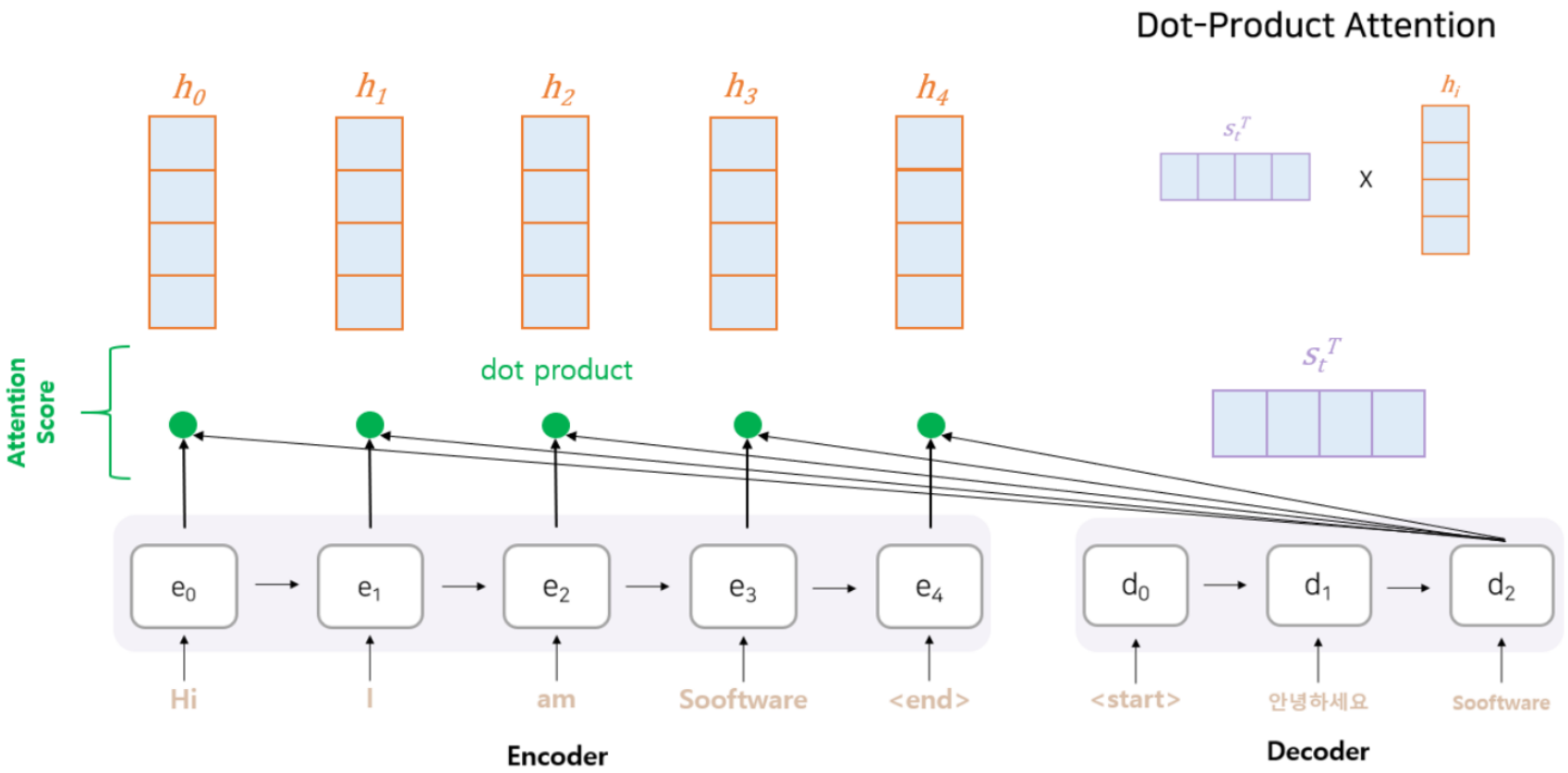
35. Mathematics will attract those it can attract, but it will do nothing to overcome resistance to science. Science is universal



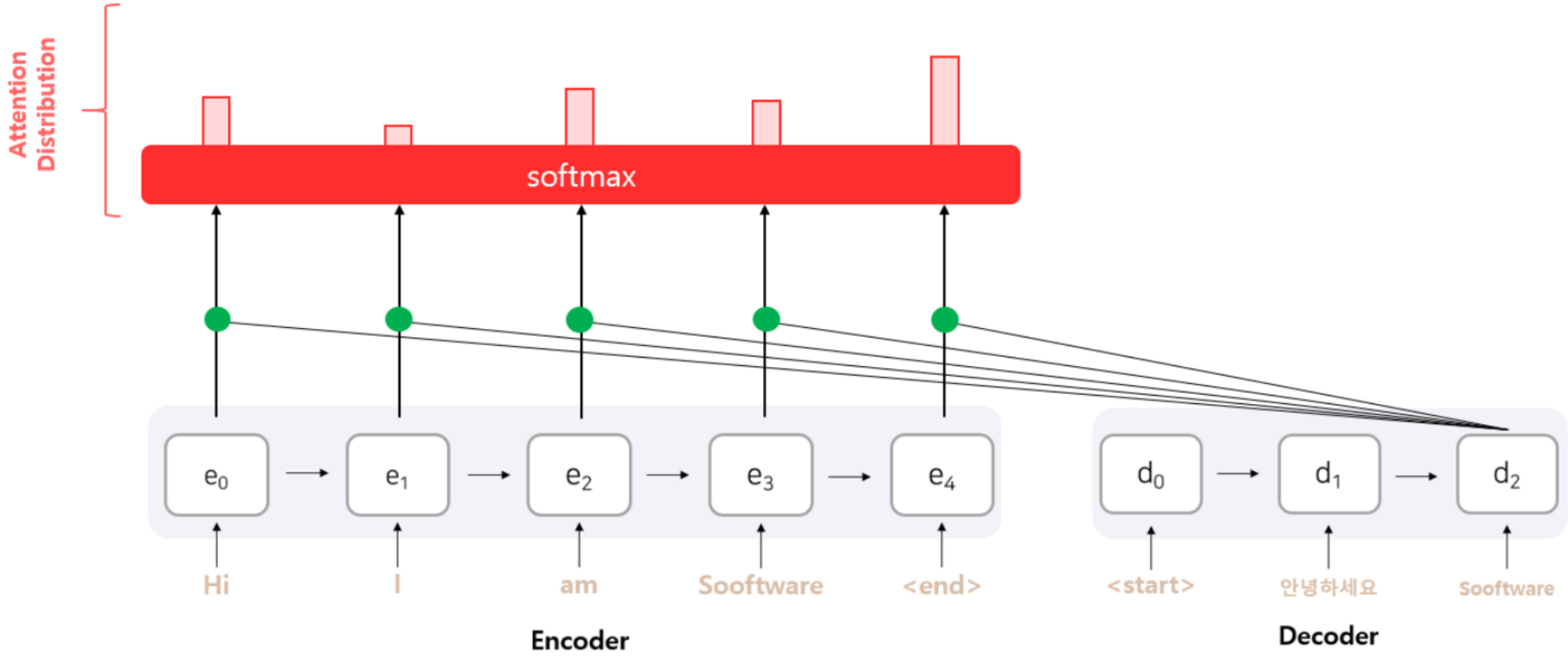
Attention Mechanism



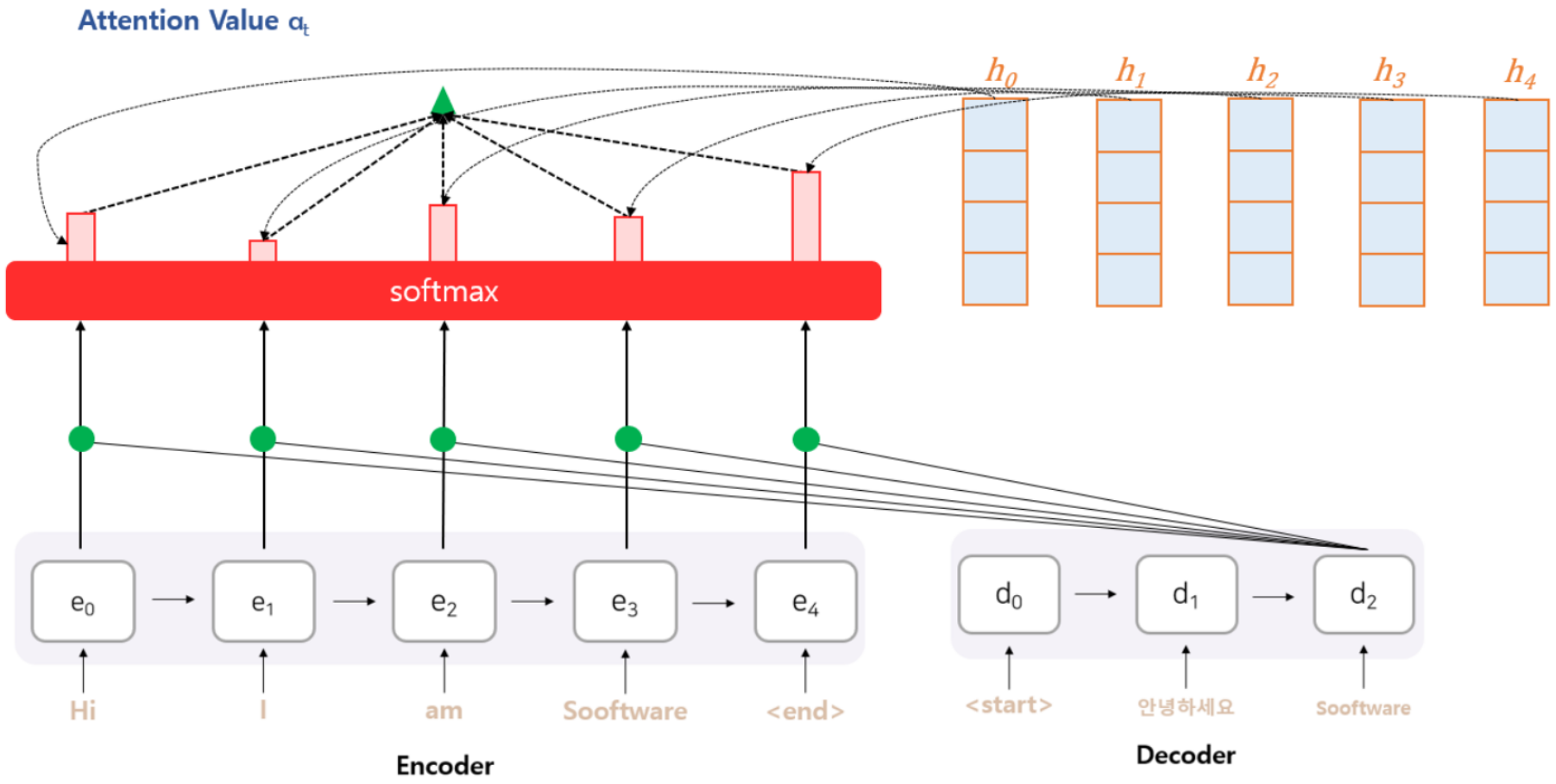
Attention Score



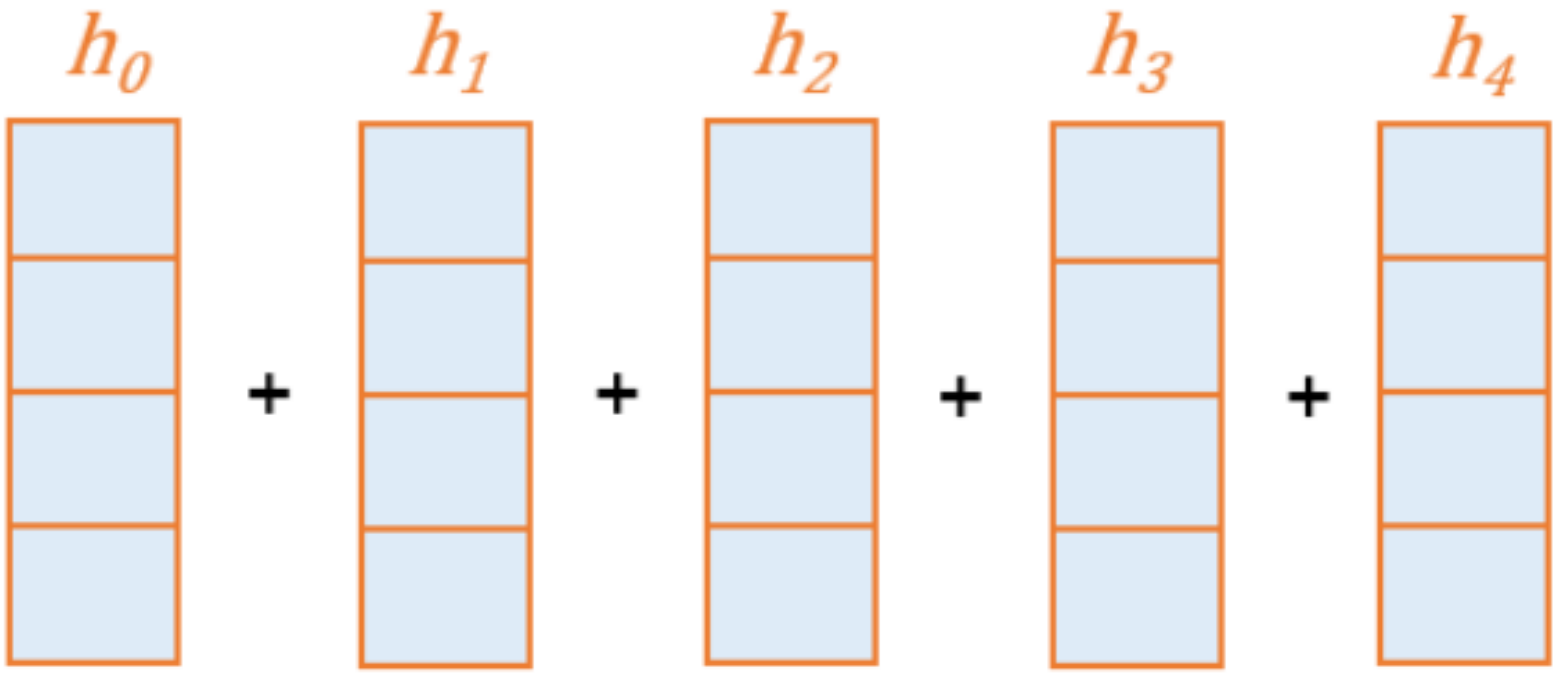
Attention Distribution

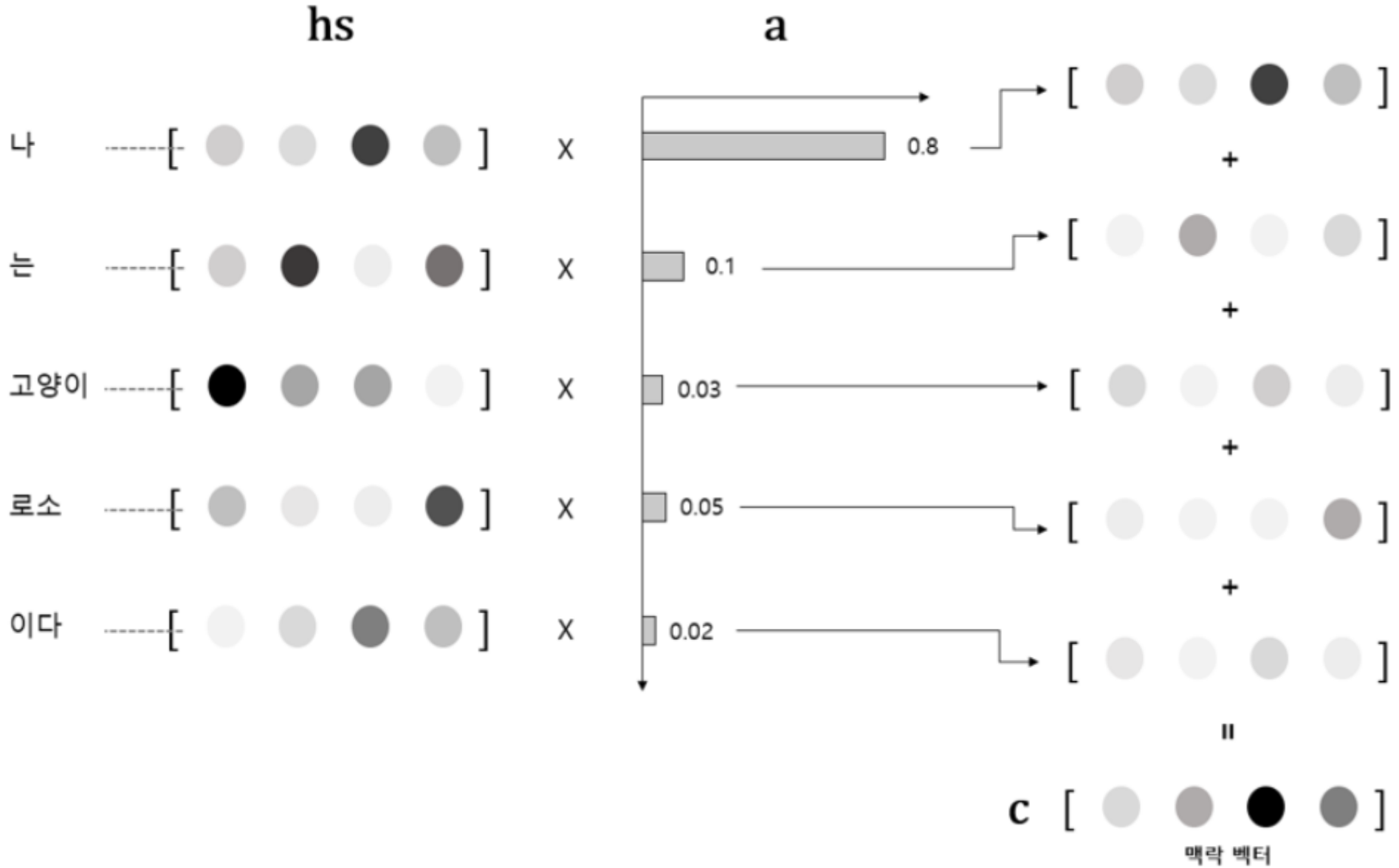


Attention Distribution X Encoder Hidden State



Weight Sum

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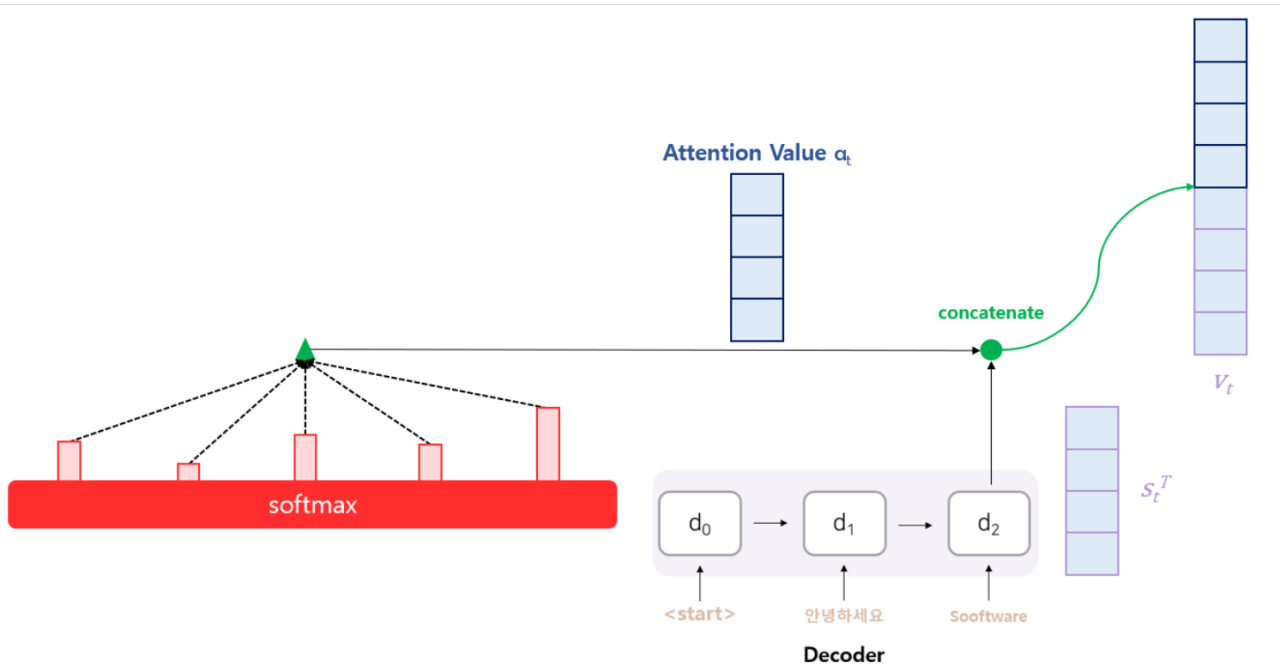

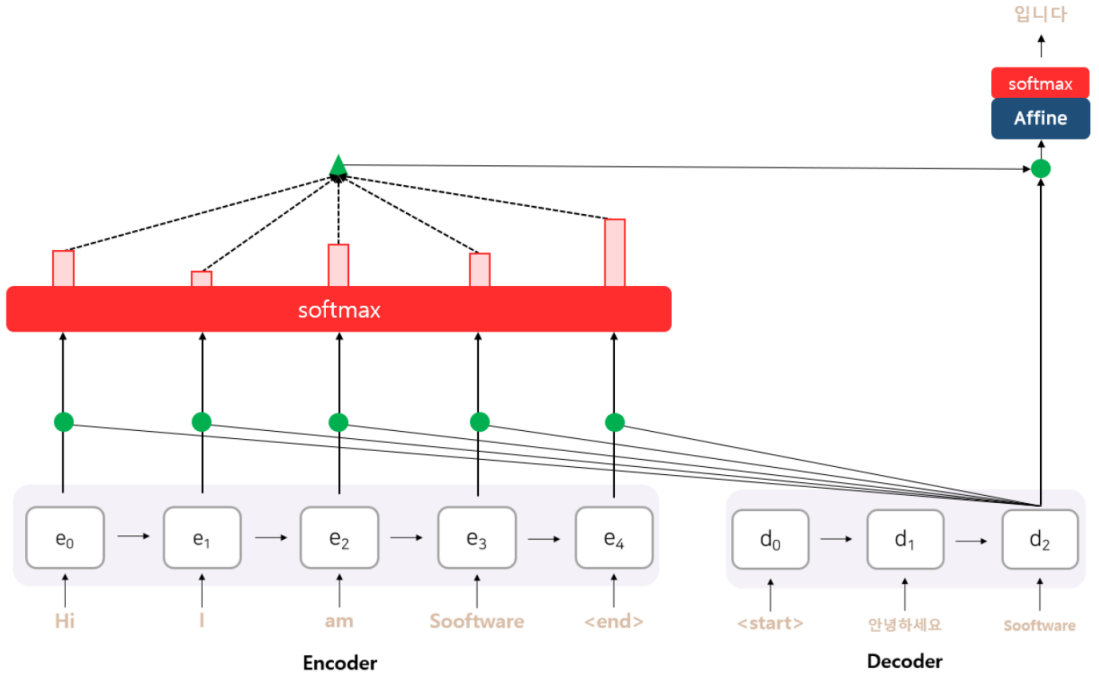

감사합니다.

참고:
https://bigdaheta.tistory.com/66
https://blog.naver.com/sooftware/221784472231