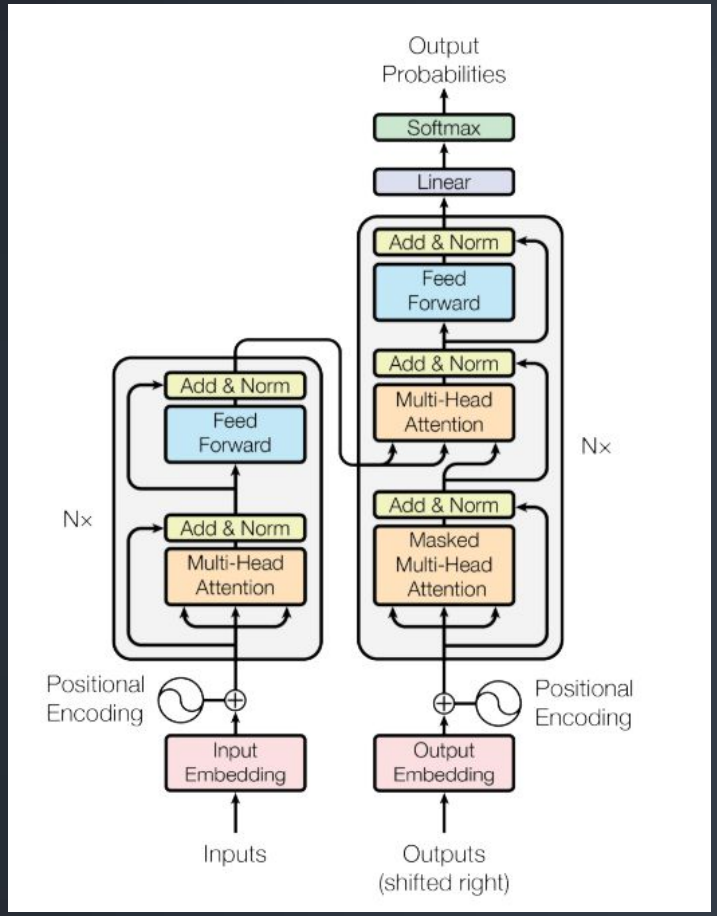
# Attention is all you need

*(Ashish Vaswani, Noam Shazeer, Niki Parmar, Jakob Uszkoreit, Llion Jones, Aidan N. Gomez, Lukasz Kaiser, Illia Polosukhin)*

## Aprenentatge Automàtic

Marc Bracons

Juny de 2024


Output Probabilities
Softmax
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Add & Norm
Feed Forward
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Multi-Head Attention
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Masked Multi-Head Attention
Nx
Add & Norm
Feed Forward
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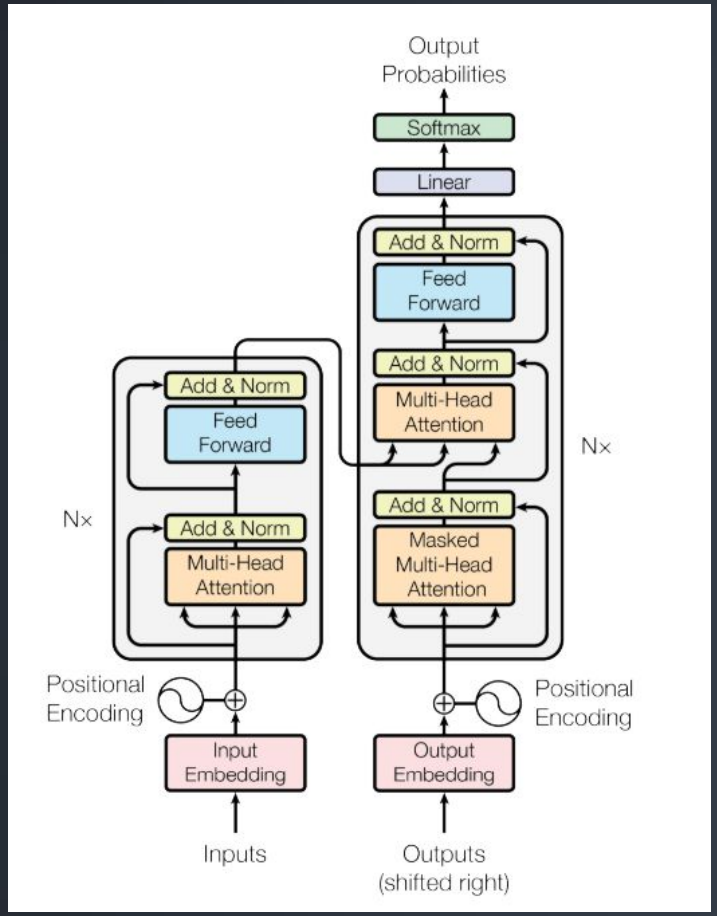
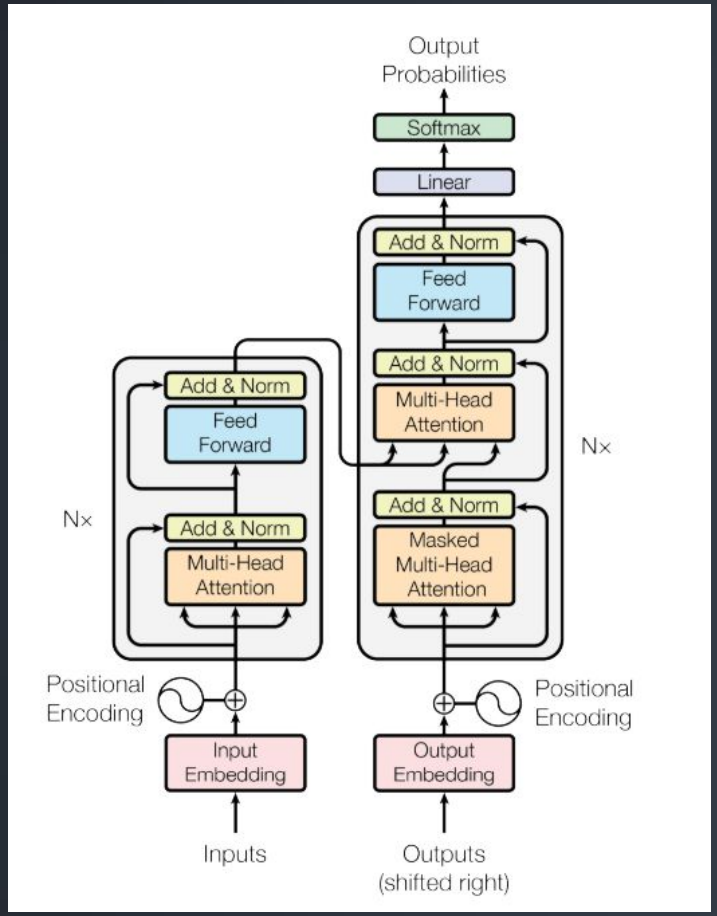
Multi-Head Attention
Nx
Positional Encoding
Positional Encoding
Input Embedding
Output Embedding
Inputs
Outputs (shifted right)

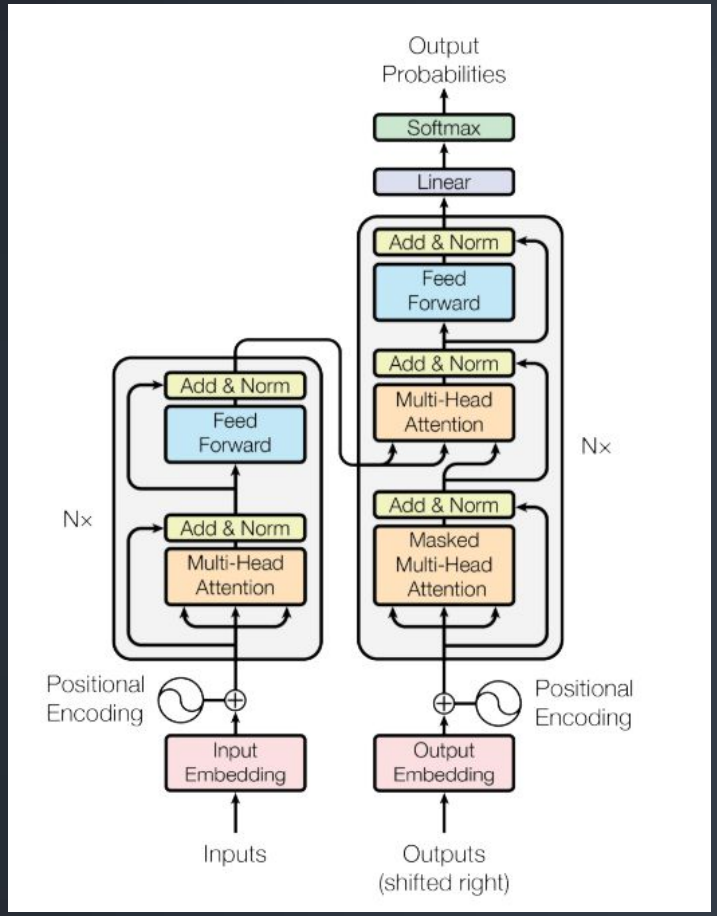
# Xarxa neuronal






## Xarxa neuronal

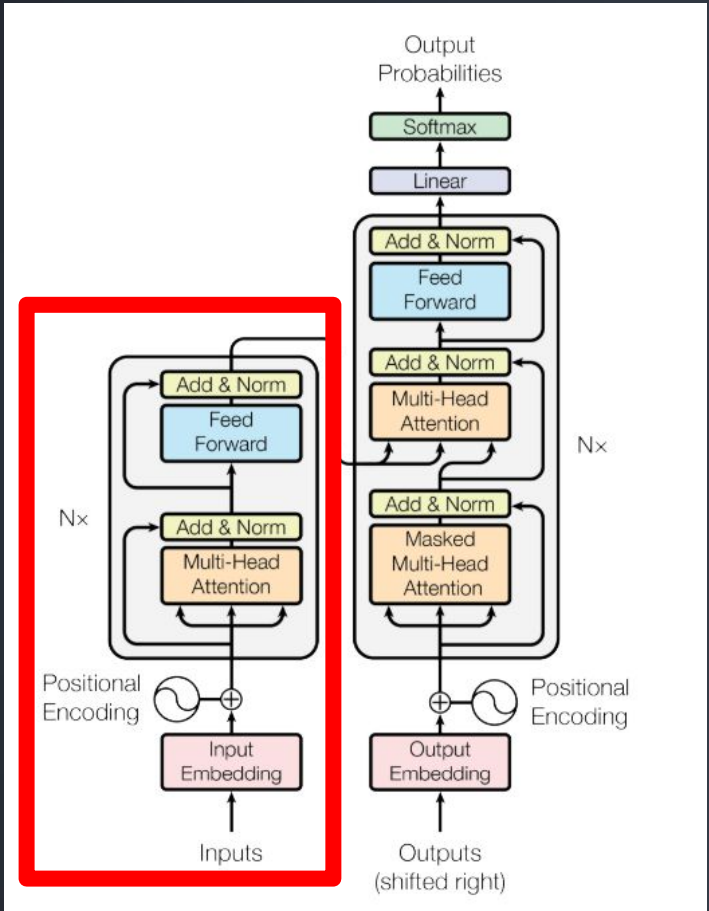
## Context i relacions




**Xarxa neuronal**

**Context i relacions**

**Aprenentatge supervisat**

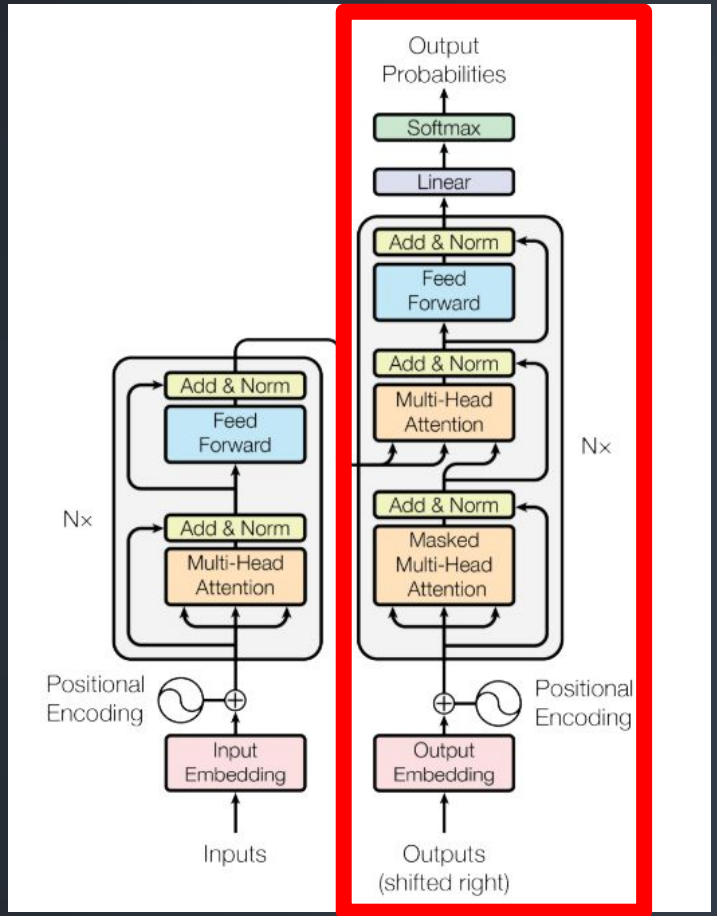



**Xarxa neuronal**

**Context i relacions**

**Aprenentatge supervisat**

**Encoder-Decoder**

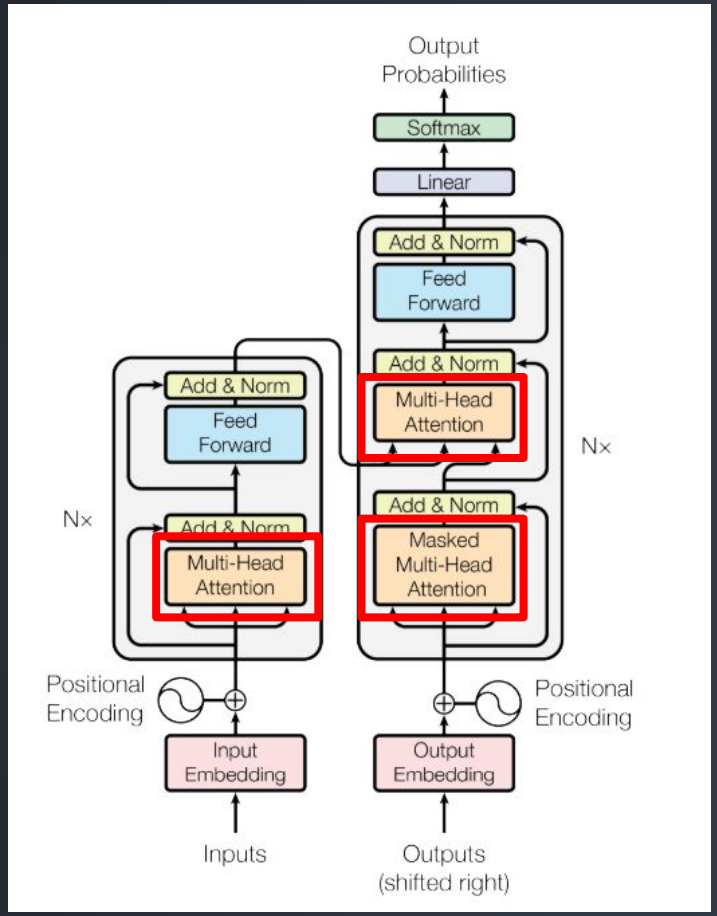



**Xarxa neuronal**

**Context i relacions**

**Aprenentatge supervisat**

**Encoder-Decoder**




**Xarxa neuronal**

**Context i relacions**

**Aprenentatge supervisat**

**Encoder-Decoder**

**Mecanisme d’atenció**

Attention

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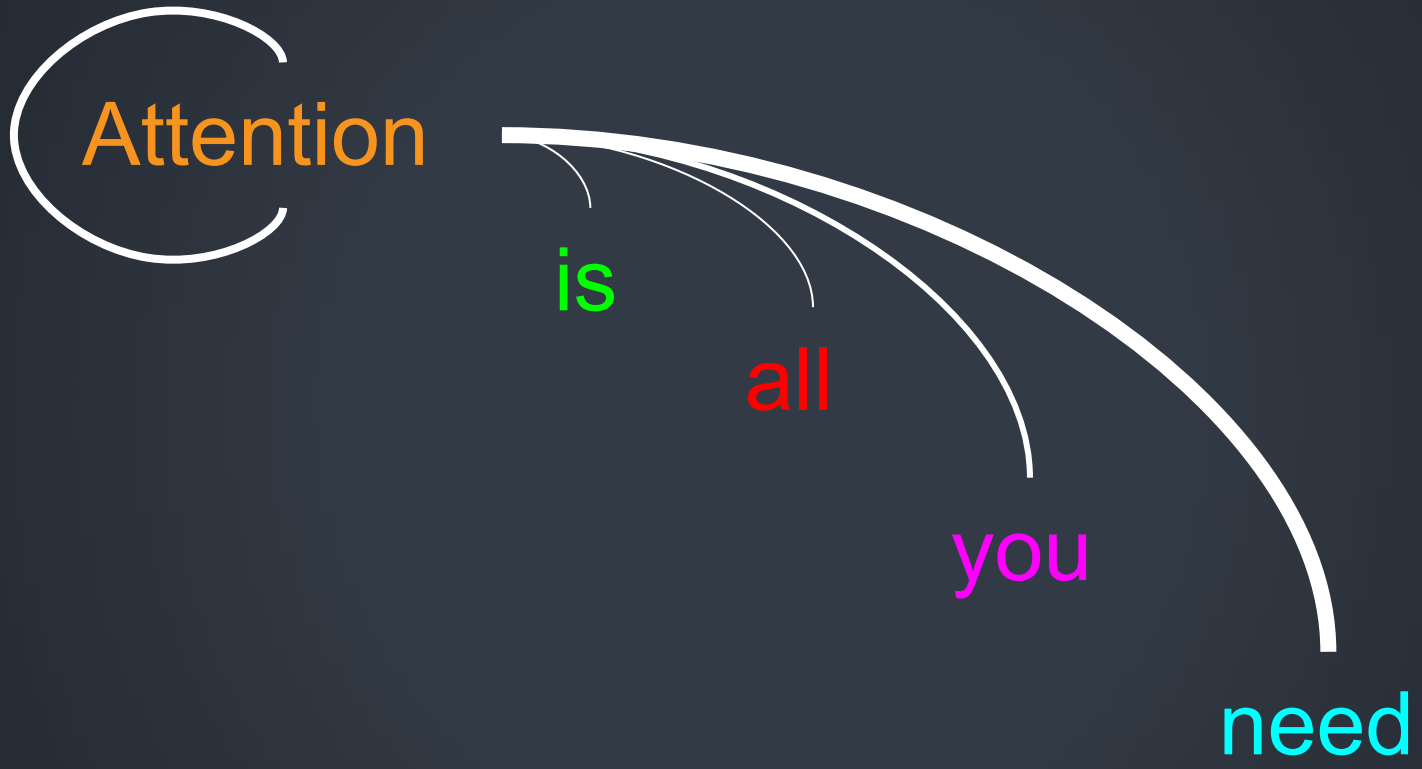
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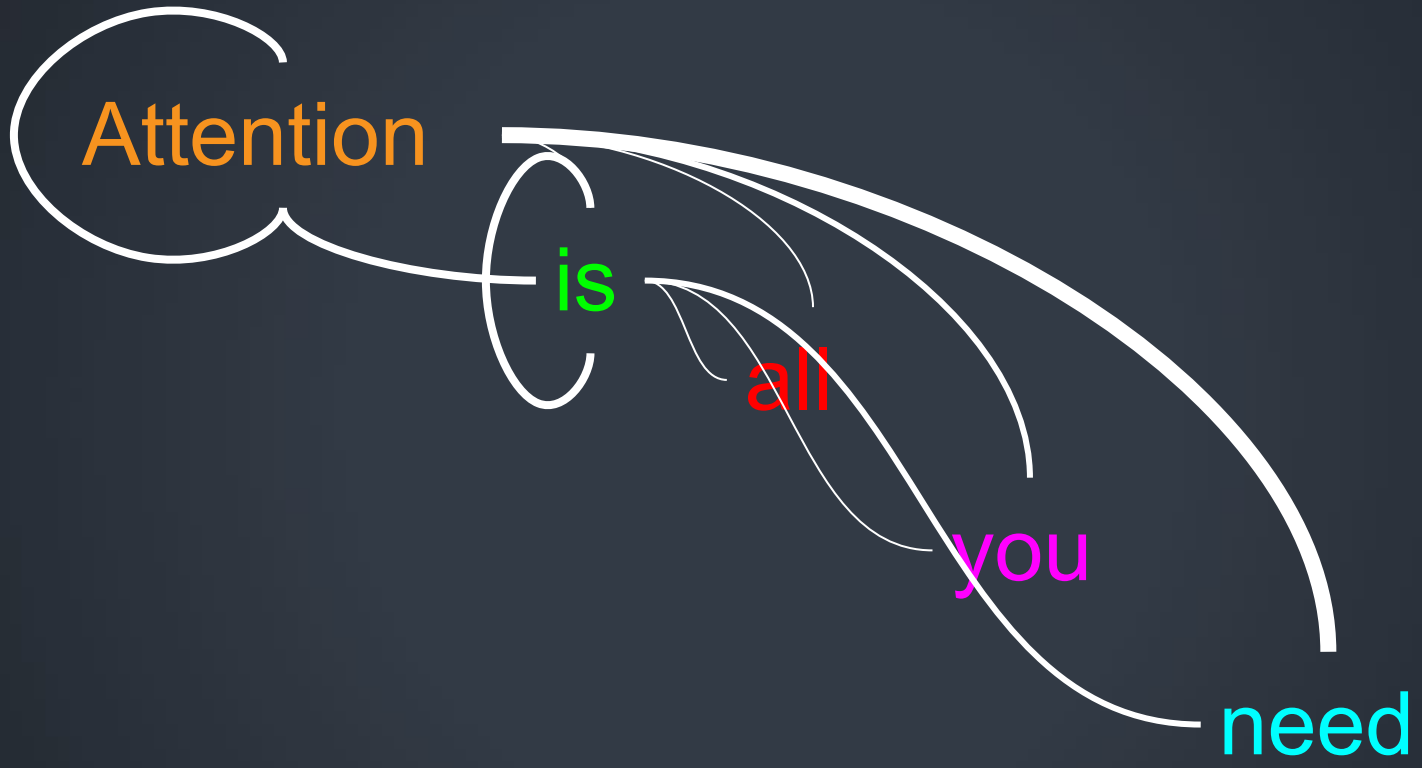
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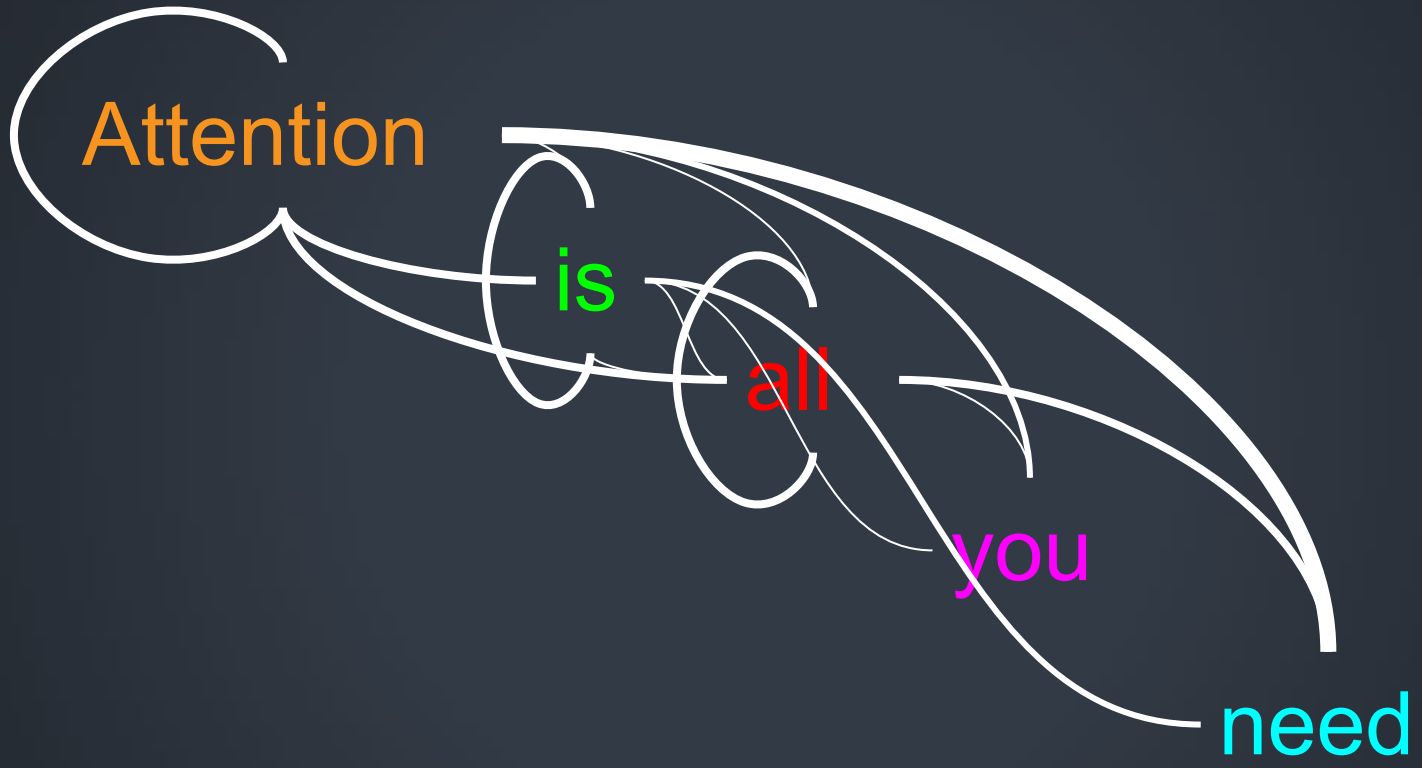
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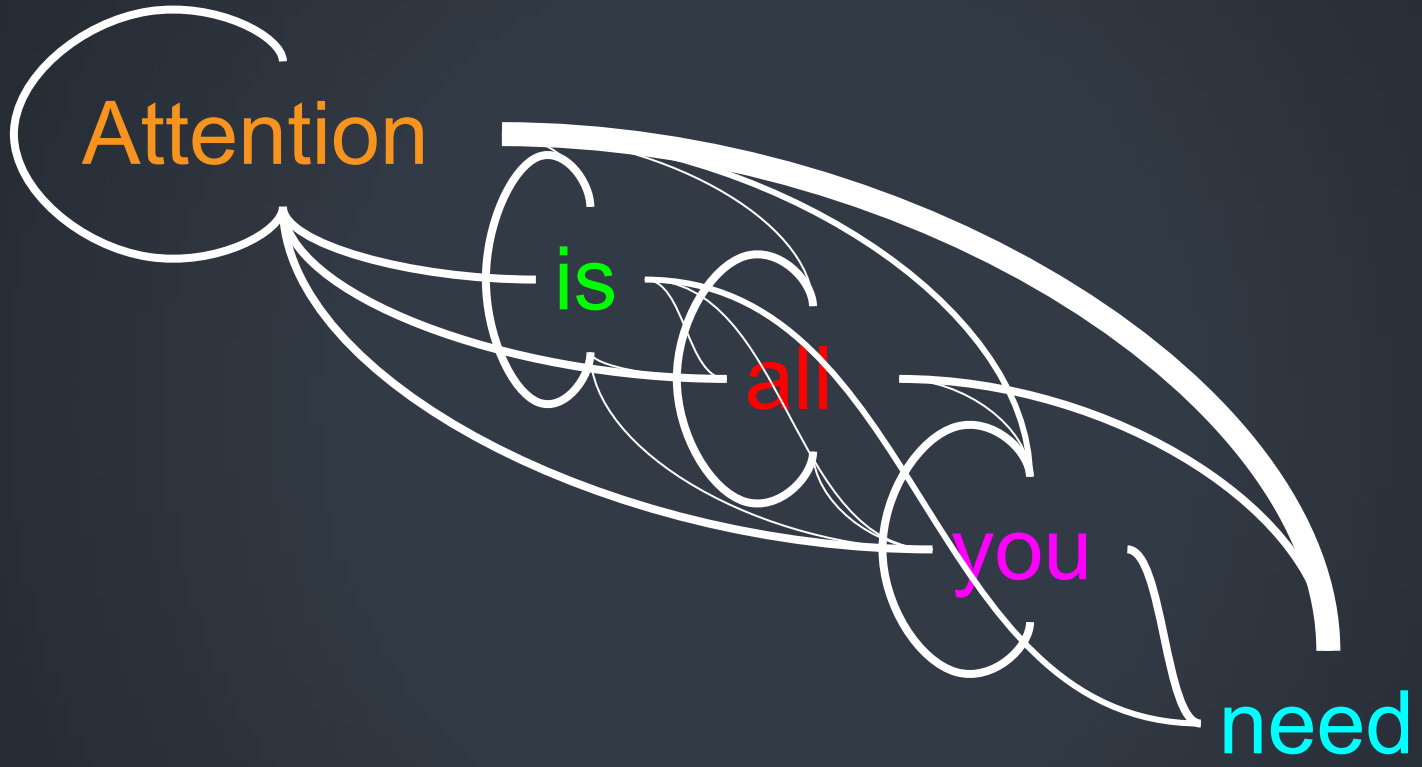
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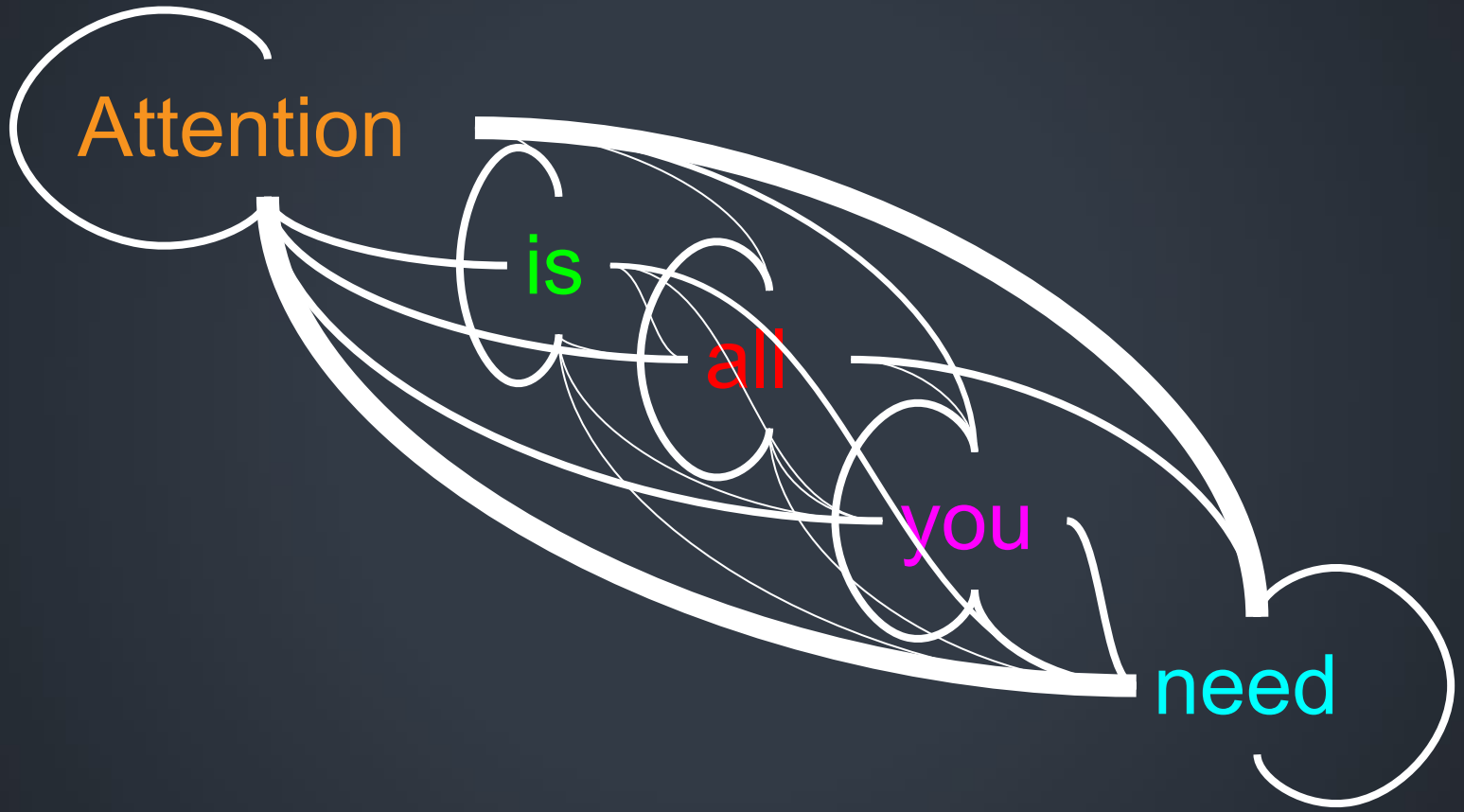
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# Com es calculen aquestes relacions?

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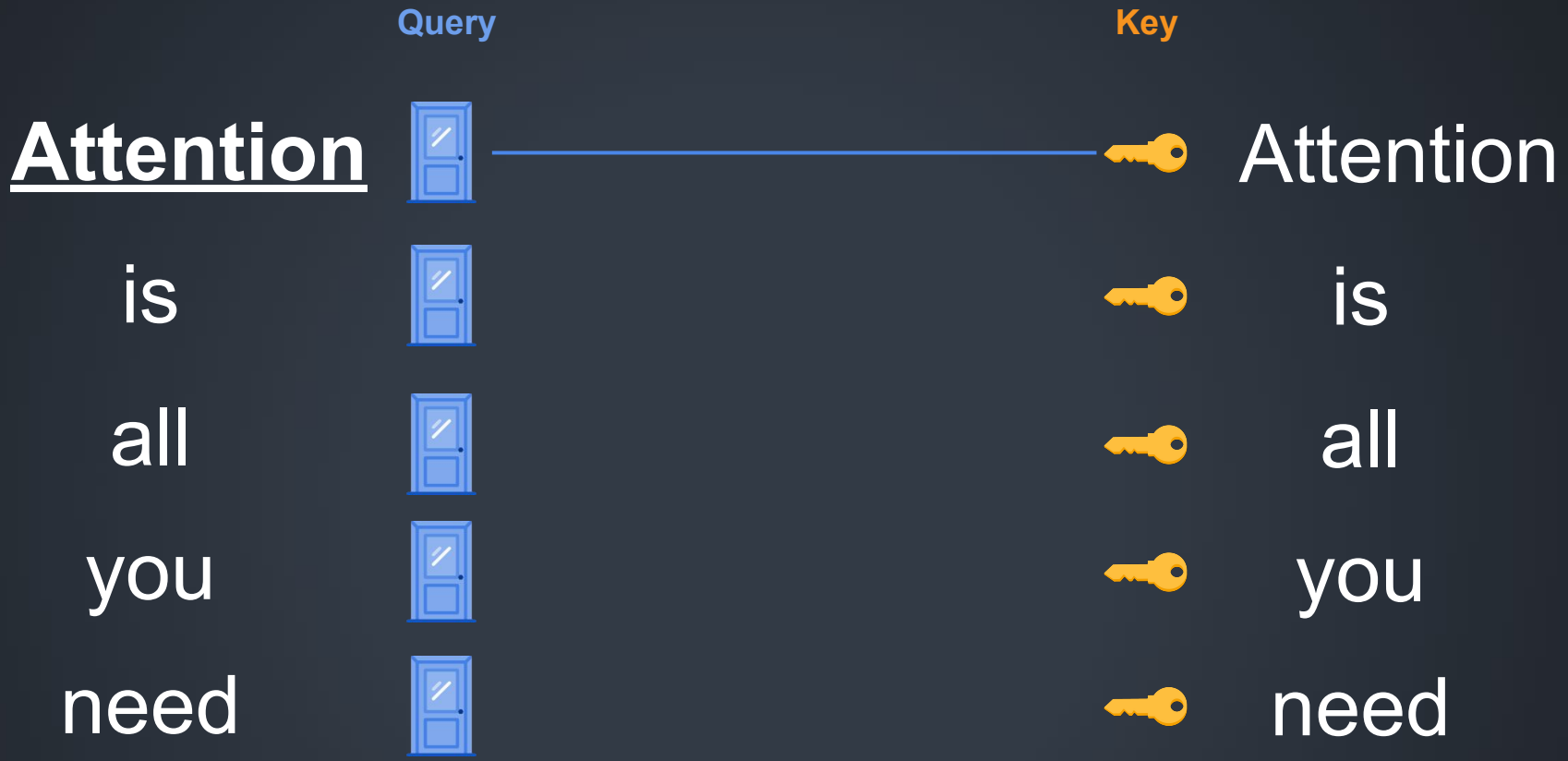
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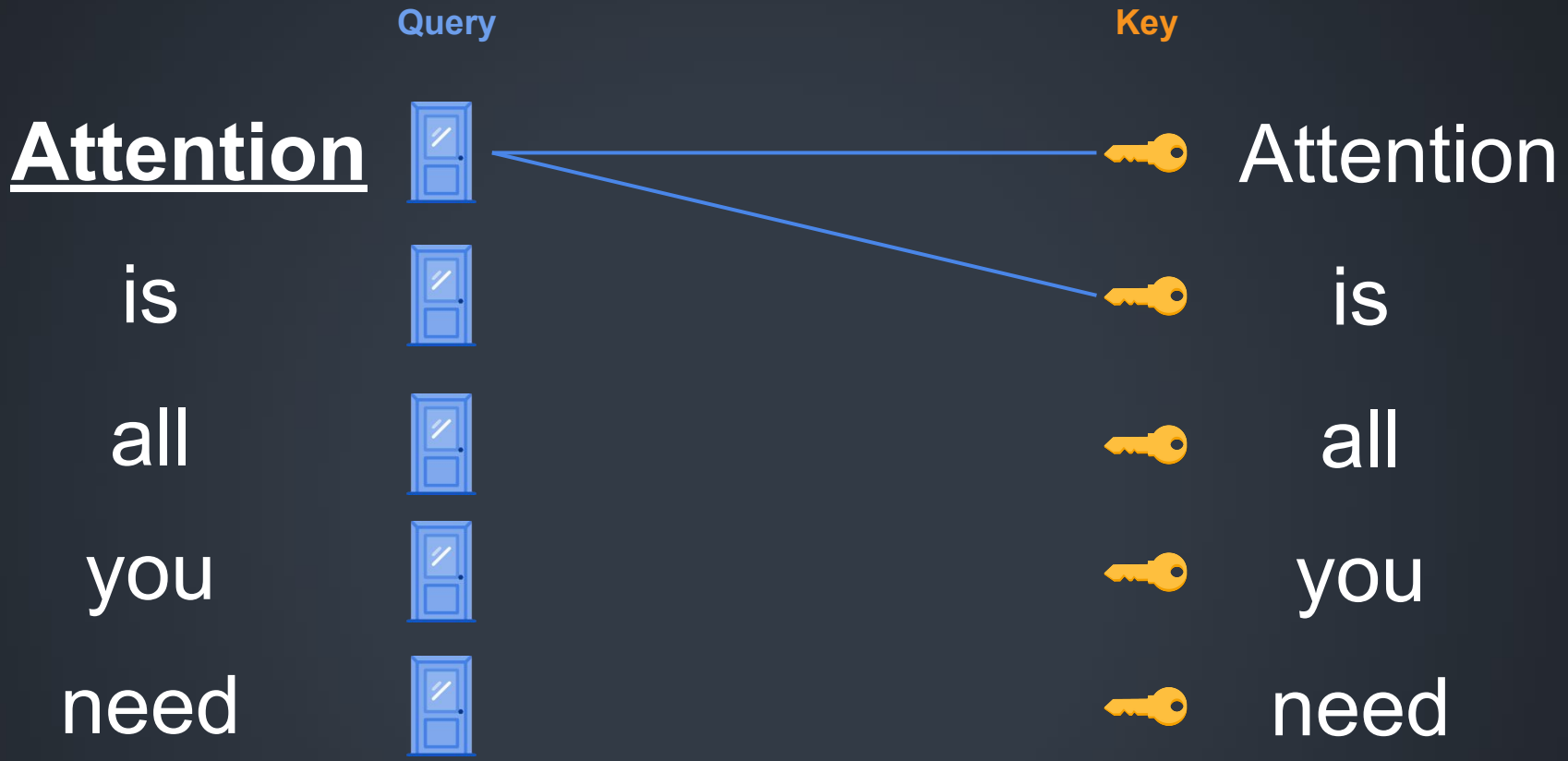
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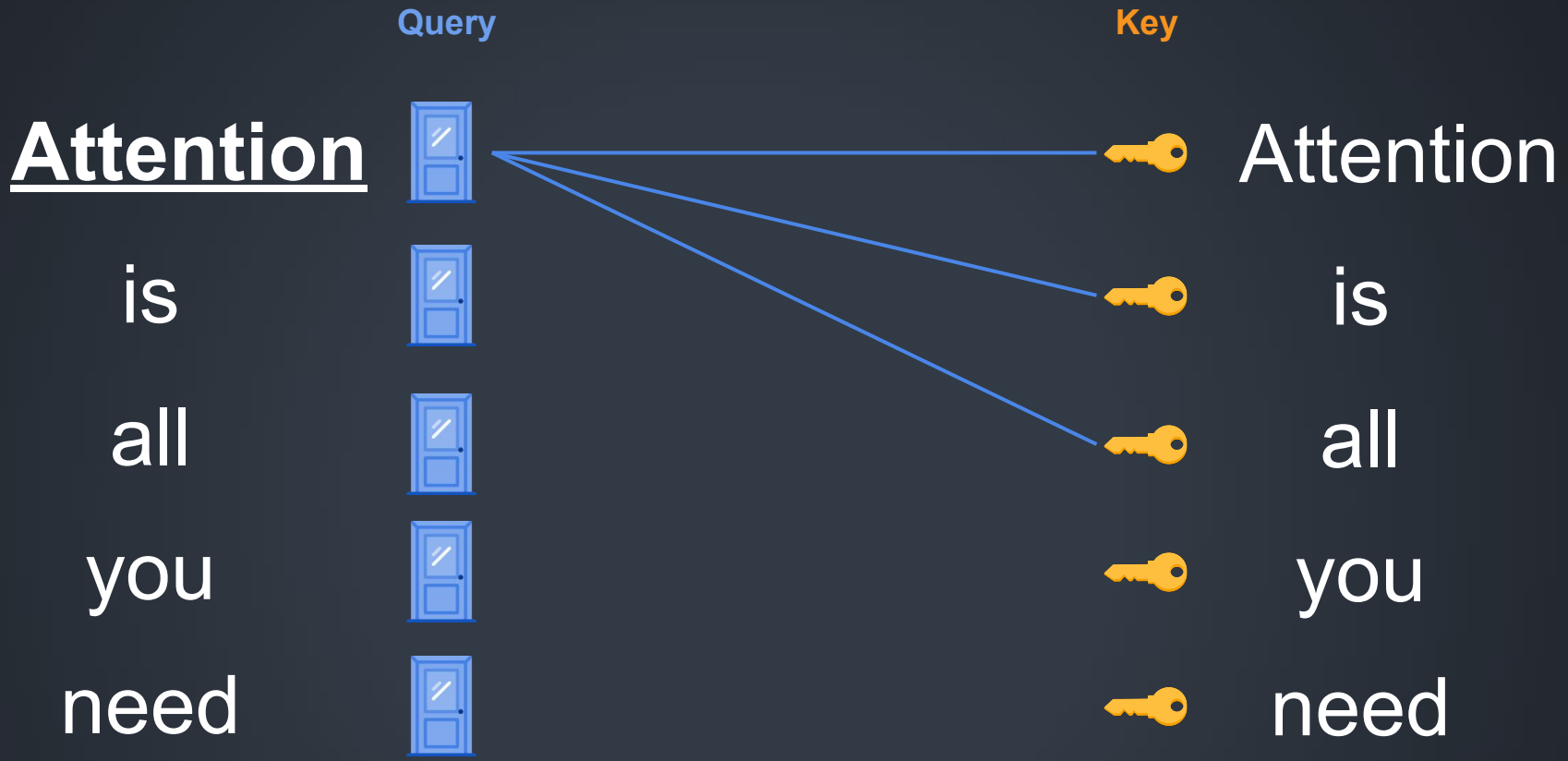
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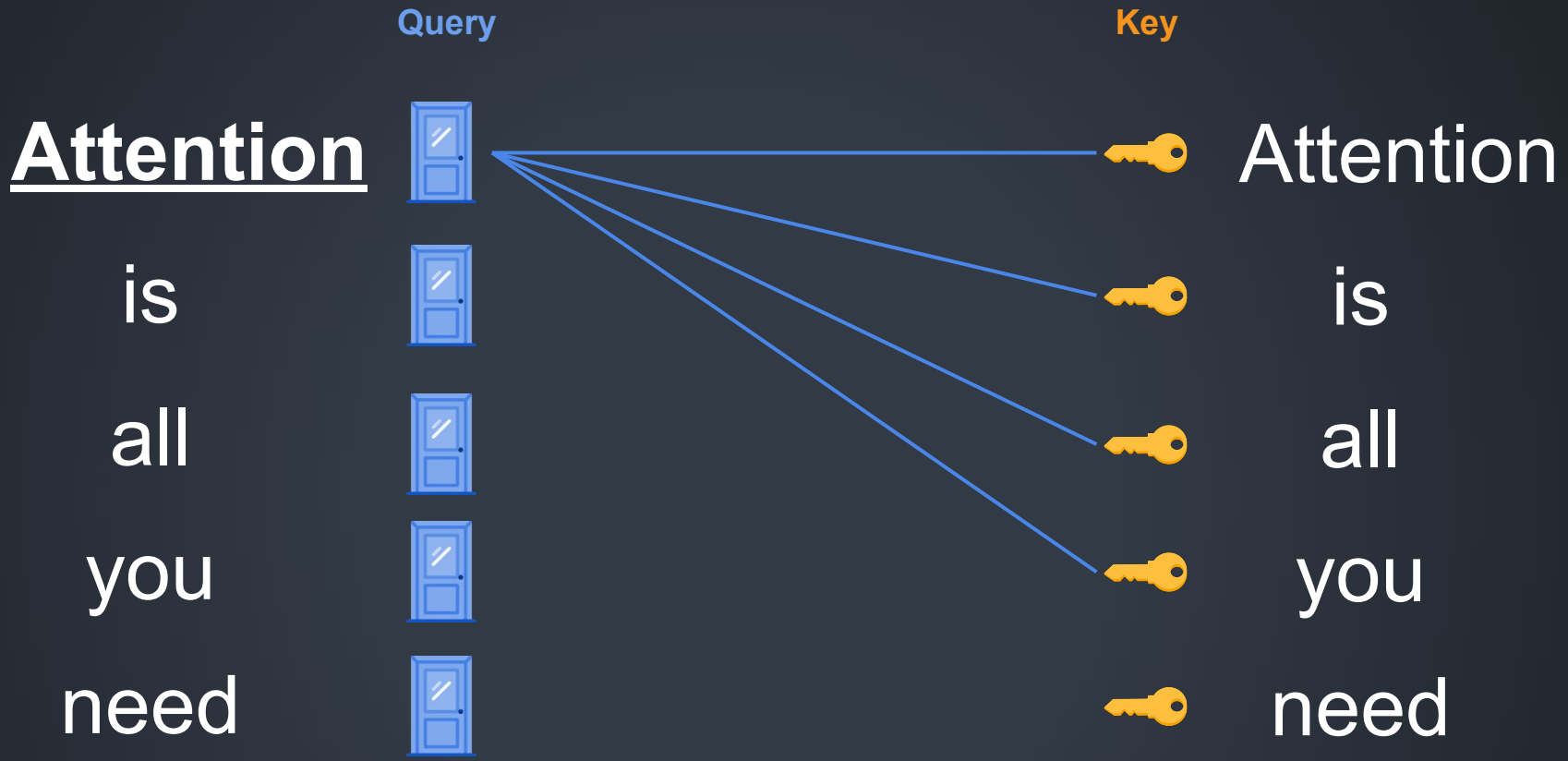
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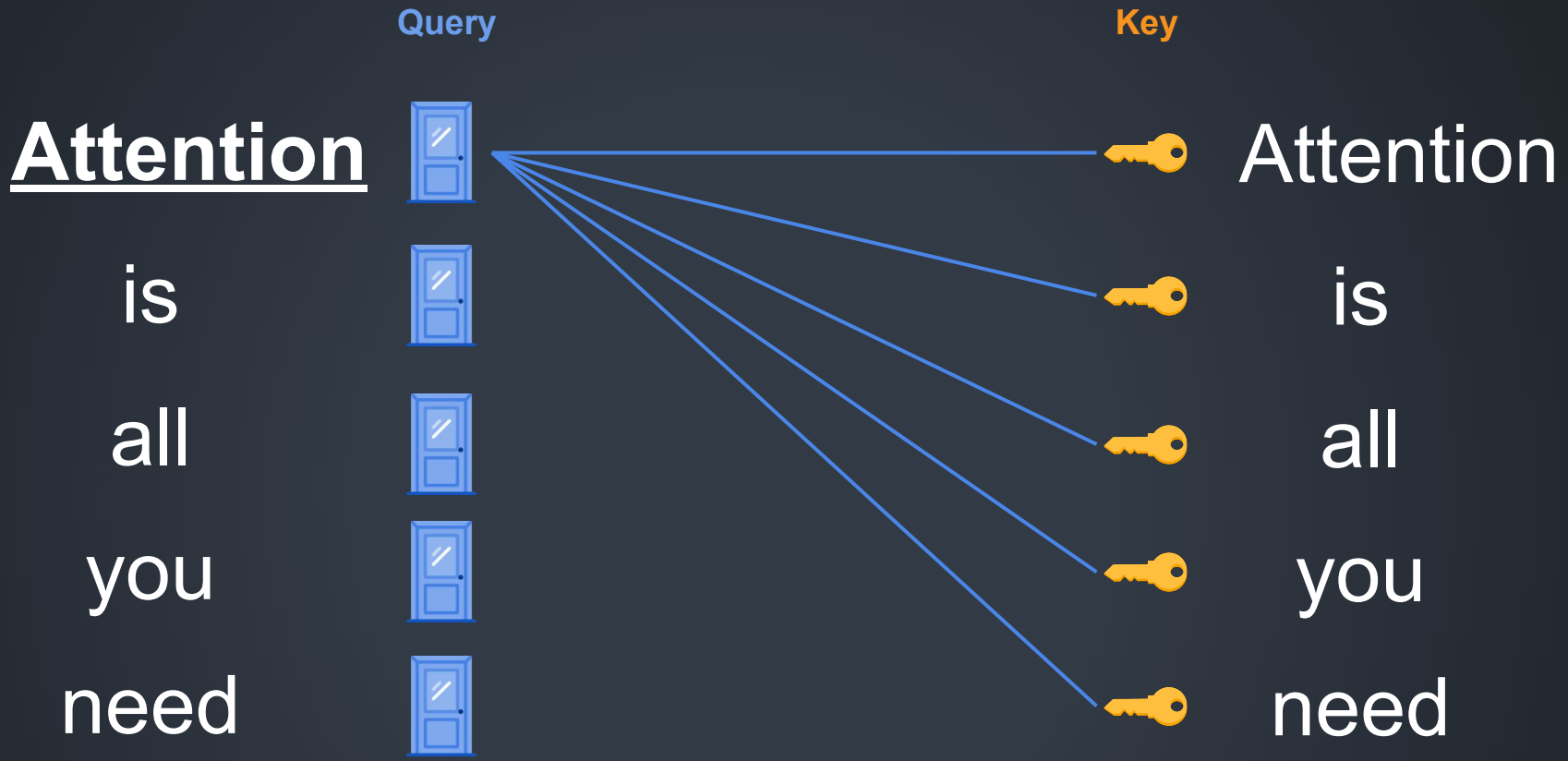
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Values

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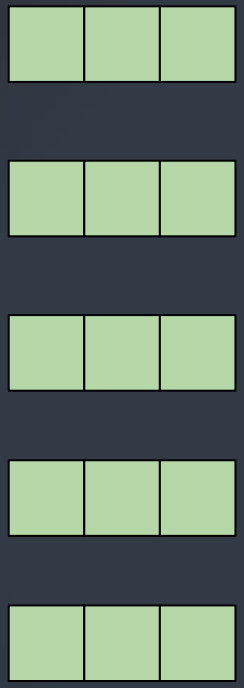

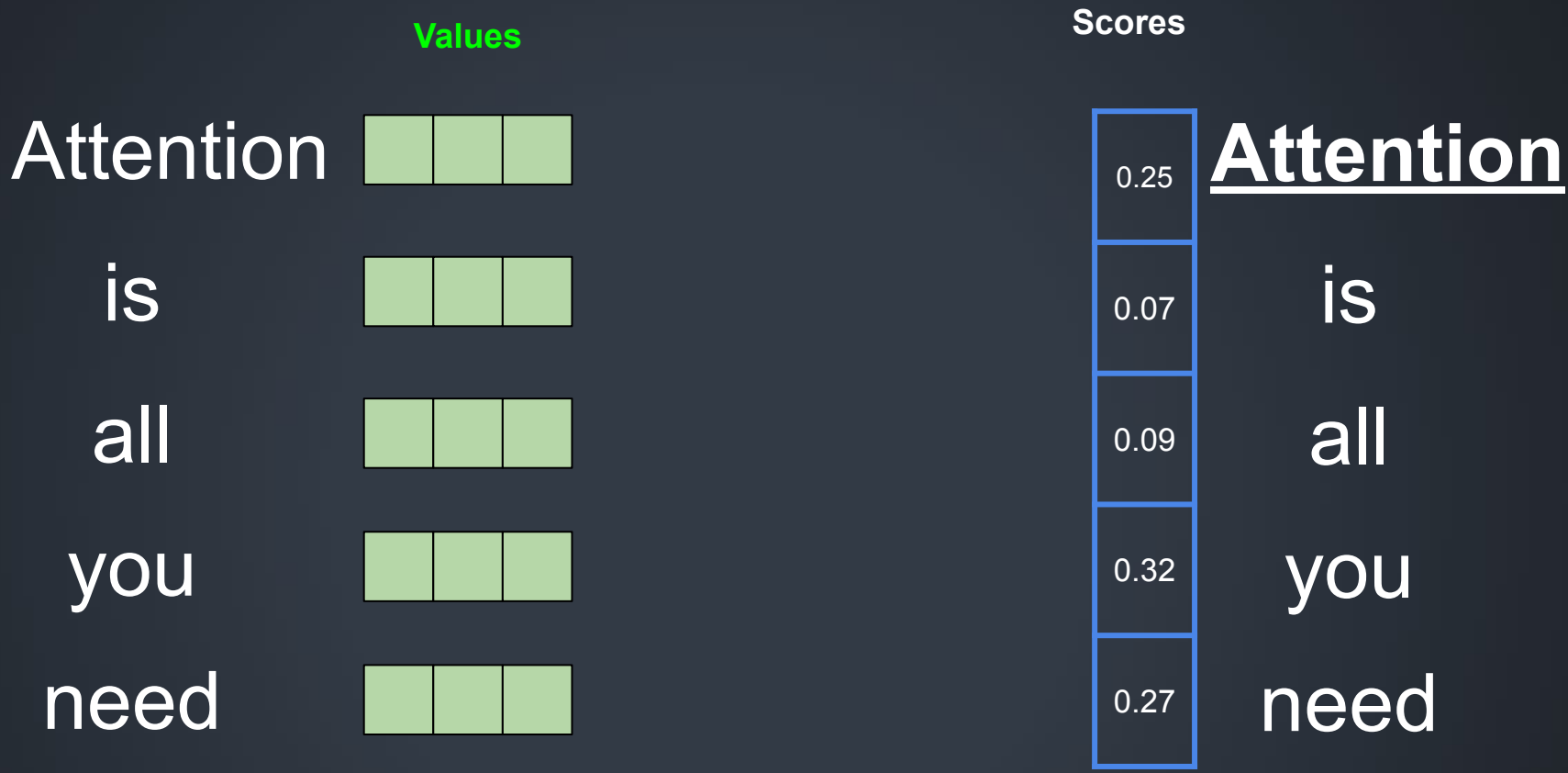
Values
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Values
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need
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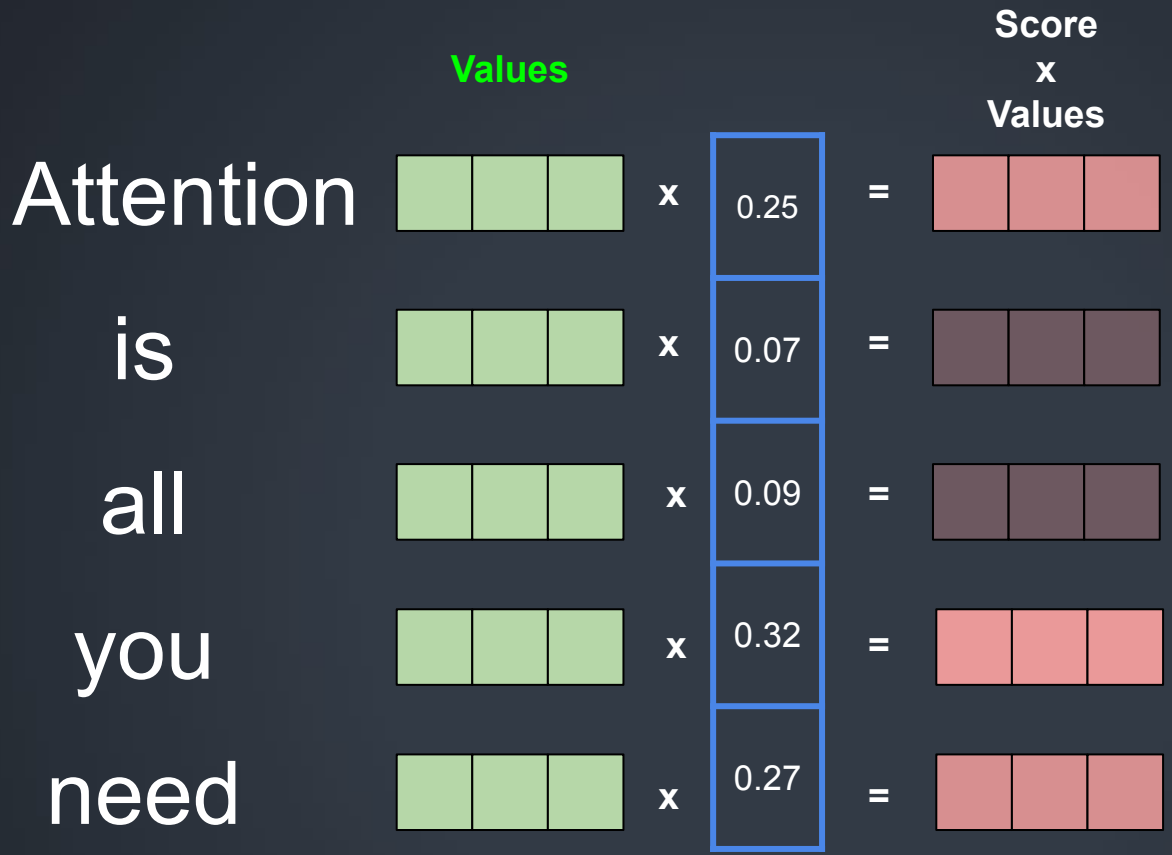
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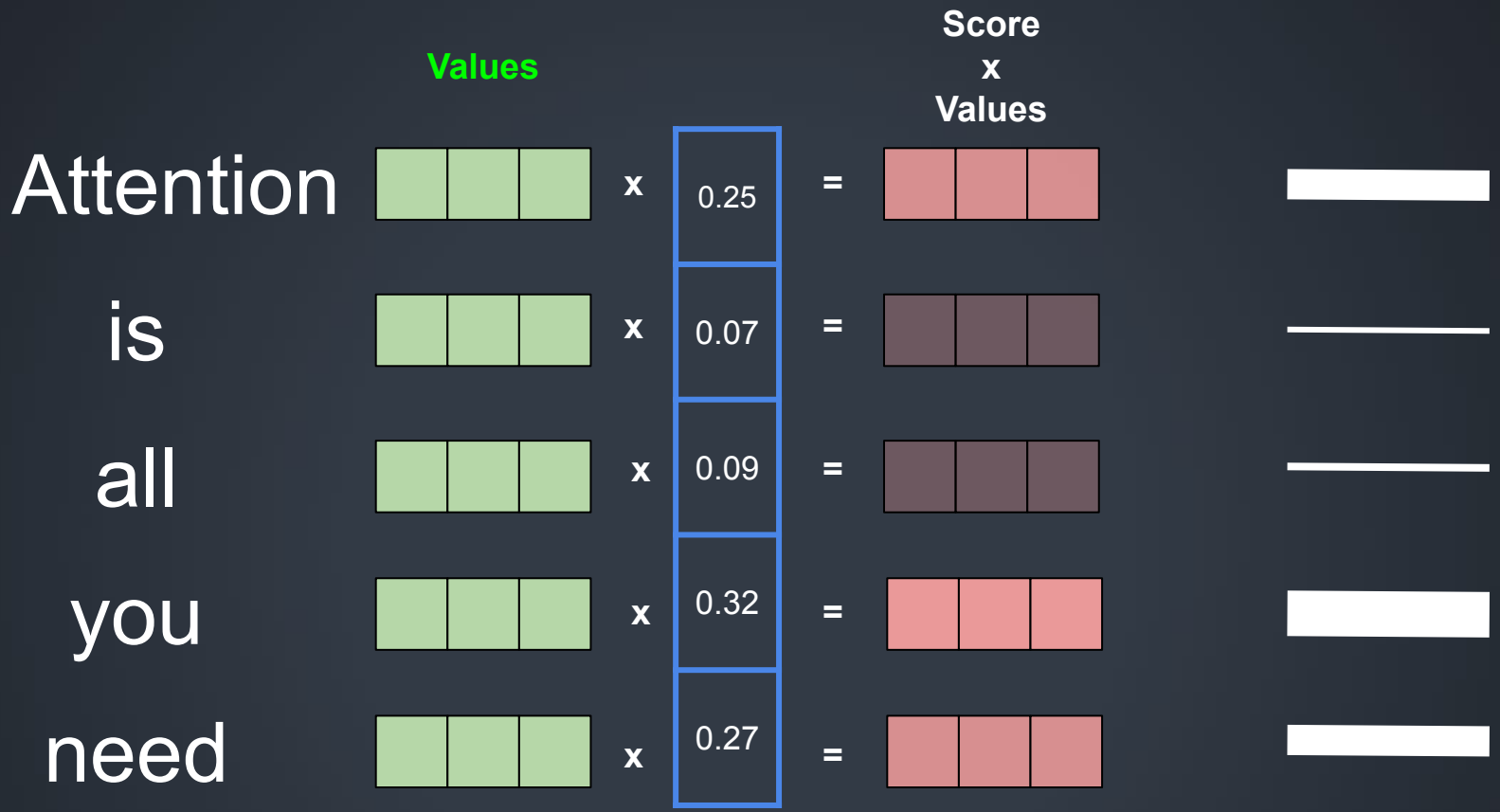
Values
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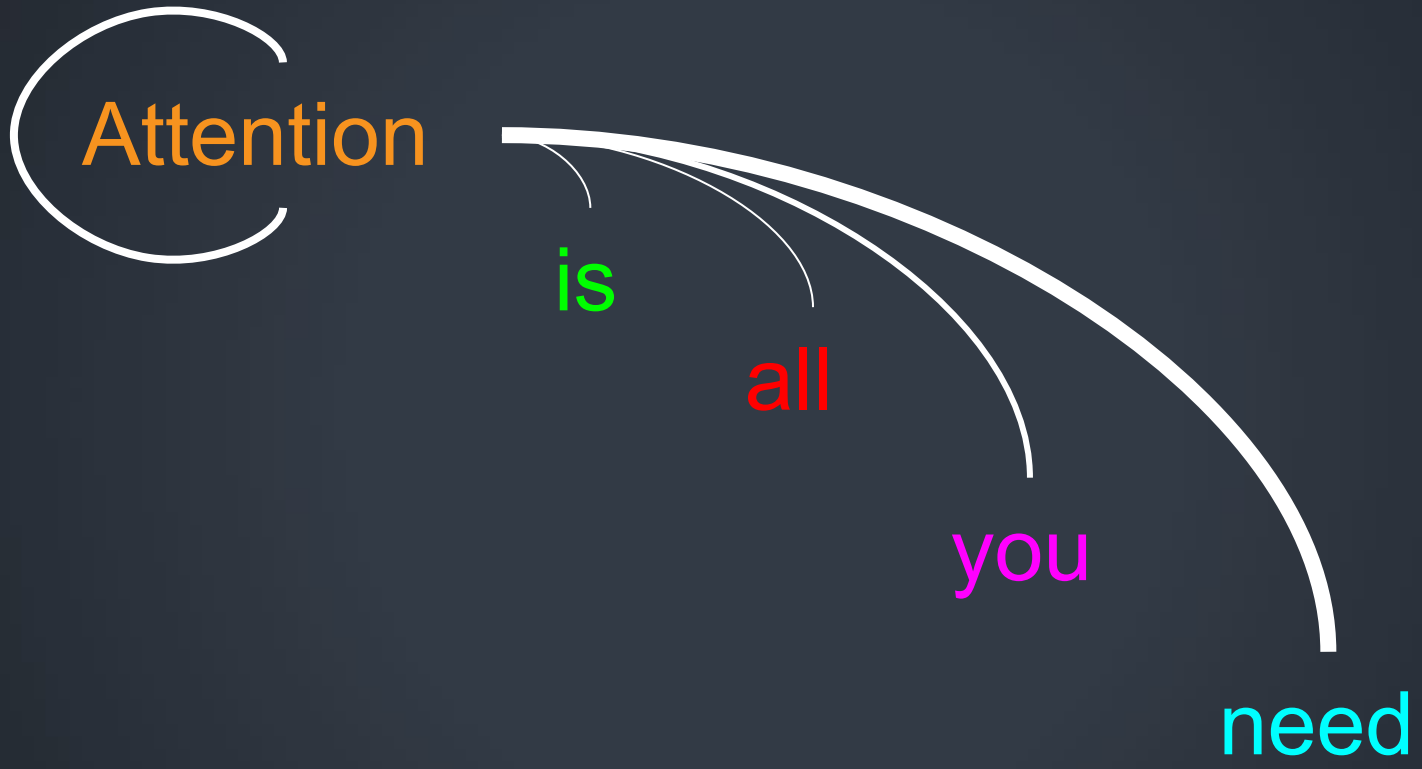
Attention
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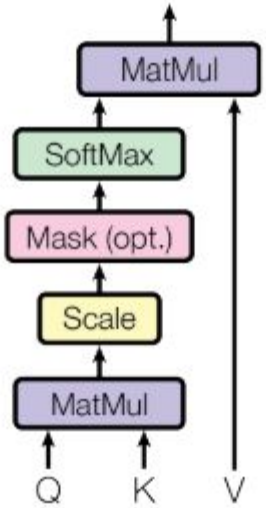
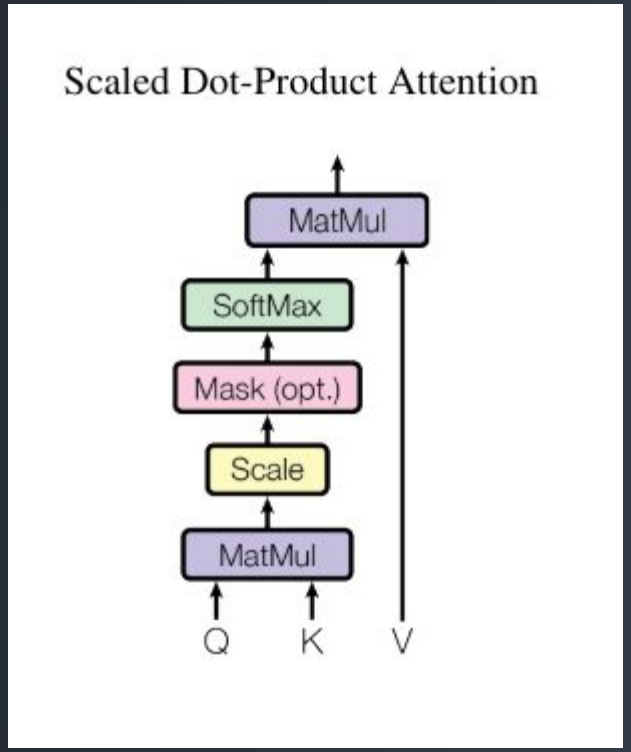
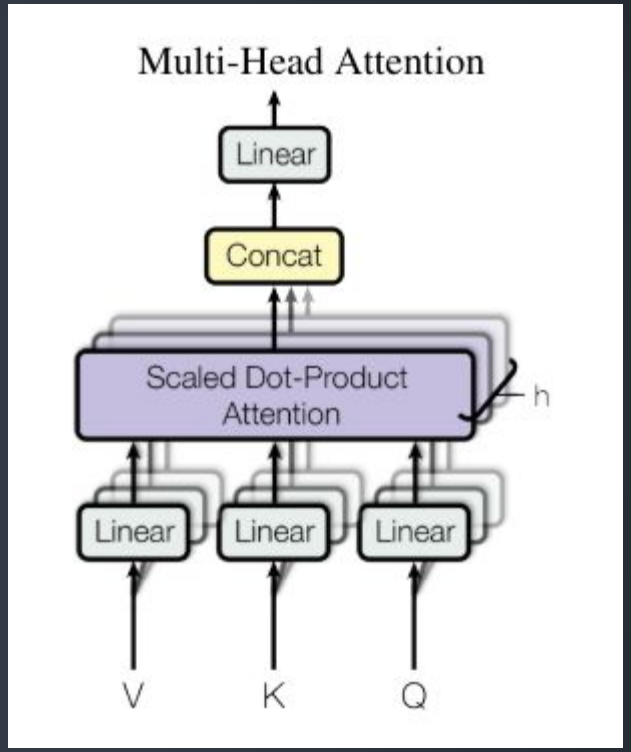
Scaled Dot-Product Attention




Scaled Dot-Product Attention
MatMul
SoftMax
Mask (opt.)
Scale
MatMul
Q
K
V


Multi-Head Attention
Linear
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Scaled Dot-Product Attention
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Linear
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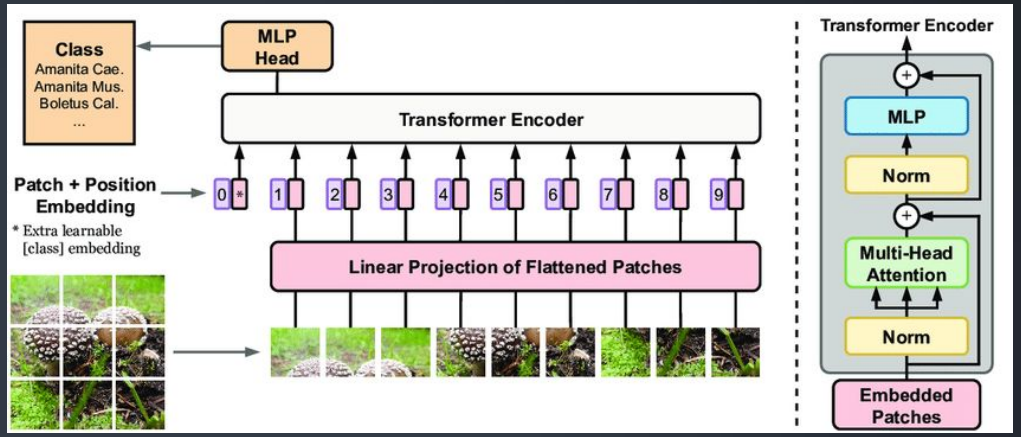
NLP

NLP


Class
Amanita Cae.
Amanita Mus.
Boletus Cal.
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MLP Head
Transformer Encoder
Patch + Position Embedding
* Extra learnable [class] embedding
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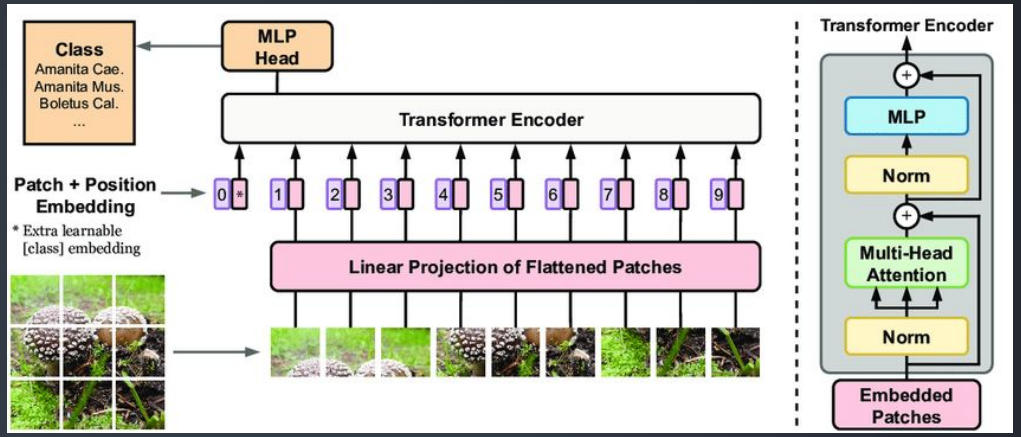
Linear Projection of Flattened Patches
Transformer Encoder
MLP
Norm
Multi-Head Attention
Norm
Embedded Patches

NLP



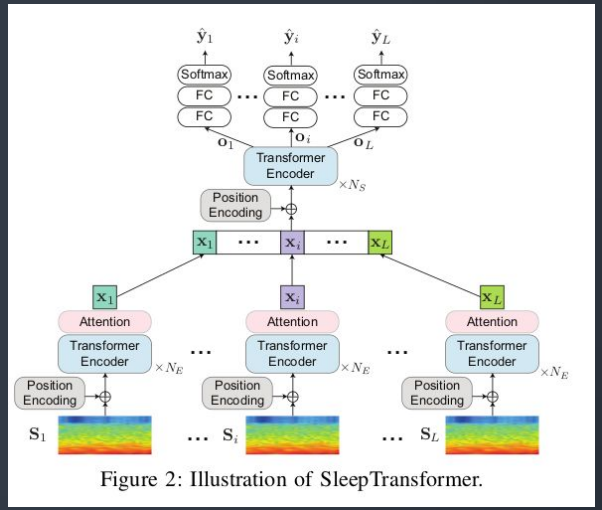




Figure 2: Illustration of SleepTransformer.