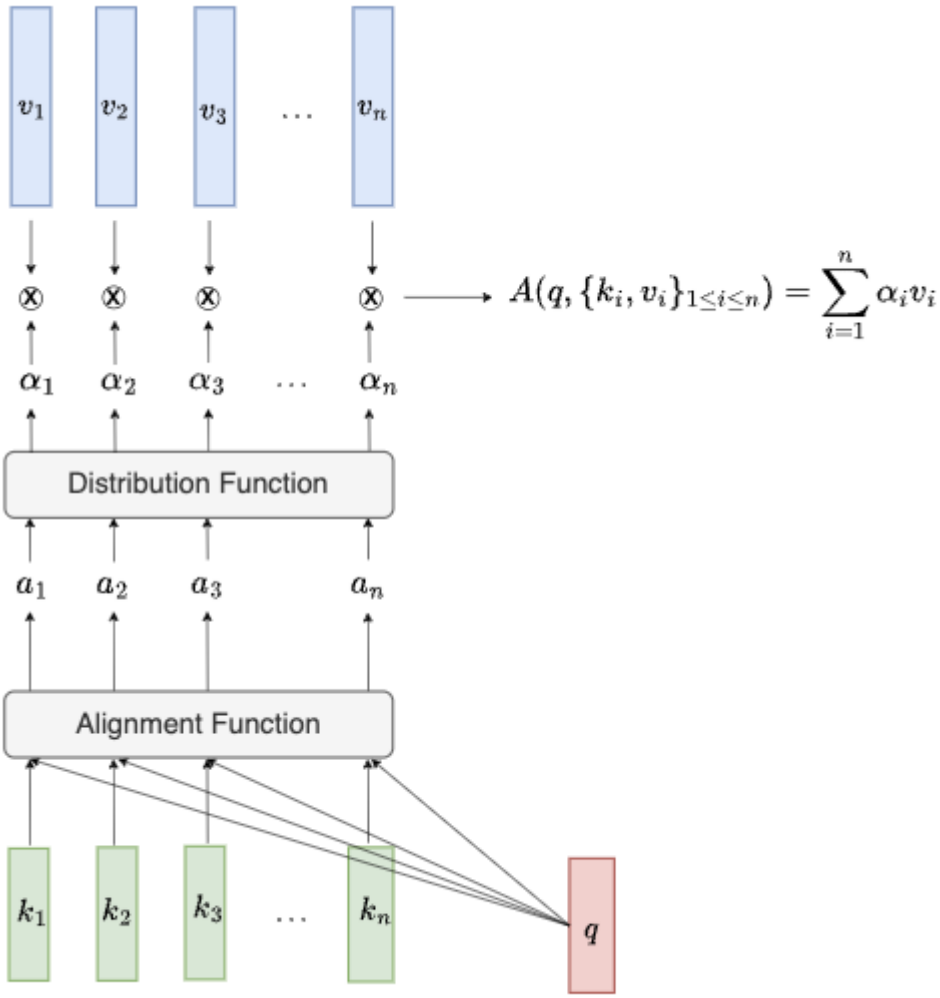
Quiz 9: Introducing the polysemy problem

*Required

1. Please enter your name: *

Soft Query Retrieval Model

The following figure represents the soft query retrieval problem (SQRP)



Let d be the dimensionality of the queries, keys and values. Consider the following Alignment Function:

$$\forall i \in \{1, \ldots, n\} \quad a(q, k_i) = \frac{q.\, k_i}{\sqrt{d}}$$

2. If the distribution function is the Softmax function, what is the correct expression of the attention weights: 2 points

Mark only one oval.

$\forall i \in \{1, \ldots, n\} \quad \alpha_i = \frac{\exp(q.\, k_i)}{\sum_{j=1}^{n} \exp(q.\, k_j)}$

(a)

$\forall i \in \{1, \ldots, n\} \quad \alpha_i = \frac{\exp(\frac{q.k_i}{\sqrt{d}})}{\sum_{j=1}^{n} \exp(\frac{q.k_j}{\sqrt{d}})}$

(b)

$\forall i \in \{1, \ldots, n\} \quad \alpha_i = \frac{q.\, k_i}{\sum_{j=1}^{n} q.\, k_j}$

(c)

3. What is the dimensionality of the attention vector 2 points

$$A(q, \{k_i, v_i\}_{1 \leq i \leq n})$$

Mark only one oval.

- d
- 3d
- n

The Self Attention Layer: Introducing the Problem

Consider the following sentence: "Tom a été entarté cet été" (which means: Tom was with a pie this summer")

Let D be the dimensionality of the embedding vectors. We consider the following embedding vectors associated with the words in "Tom a été entarté cet été".

x^1	x^2	x^3	x^4	x^5	x^T
Tom	a	été	entarté	cet	été

4. By using pre-trained word vectors like the Word2vec or the GloVe embedding vectors, we have: 2 points

$$X^3 = X^T$$

Mark only one oval.

- True
- False

5. By letting the model learn the parameters of the embedding matrix, we have: 2 points

$$X^3 = X^T$$

Mark only one oval.

- True
- False

6. Which sentence is correct ? 2 points

Mark only one oval.

- Although the word "été" has two different meanings in the sentence, it has the same embedding vector.
- The Word2vec/GloVe approach will compute a different embedding vector for the word "été" depending on its position in the sentence
- An Embedding Layer with a trainable embedding matrix will assign different embeddings to the word "été" depending on the position in the sentence.