

# Models That Explain Themselves

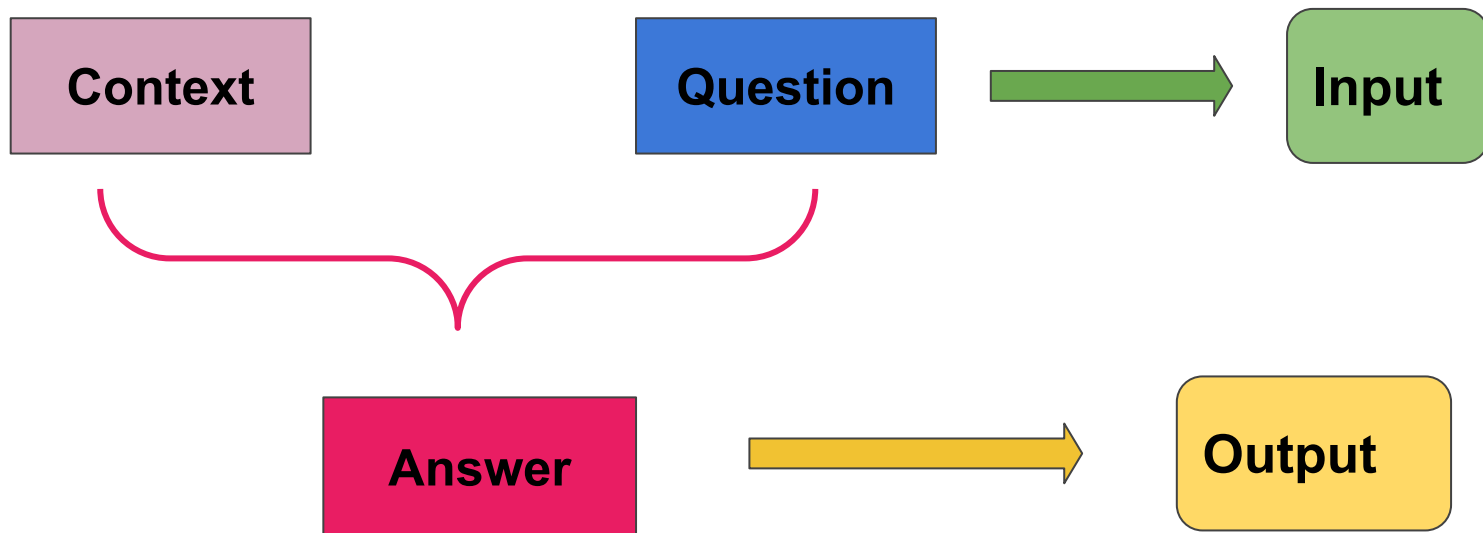
## Project 2: Language Task

Valentina Tretti and Radhika Yadav

# Question Answering

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- **Goal:** extract the answer of the question in the text, if it exists.



# Dataset- MLQA

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- **MLQA** from Lewis, P., Oguz, B., Rinott, R., Riedel, S., Schwenk, H. (2019)
- Dataset for evaluating cross-lingual question answering performance
- Around 12k instances for English
- Columns:
  - ID
  - Question
  - Context
  - Answer

# Model Training and Evaluation

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- **BERT base cased** model, trained on the **SQuAD** dataset

Overall Performance	
<i>Exact Match (EM)</i>	<i>F1 score</i>
58.843%	71.81%

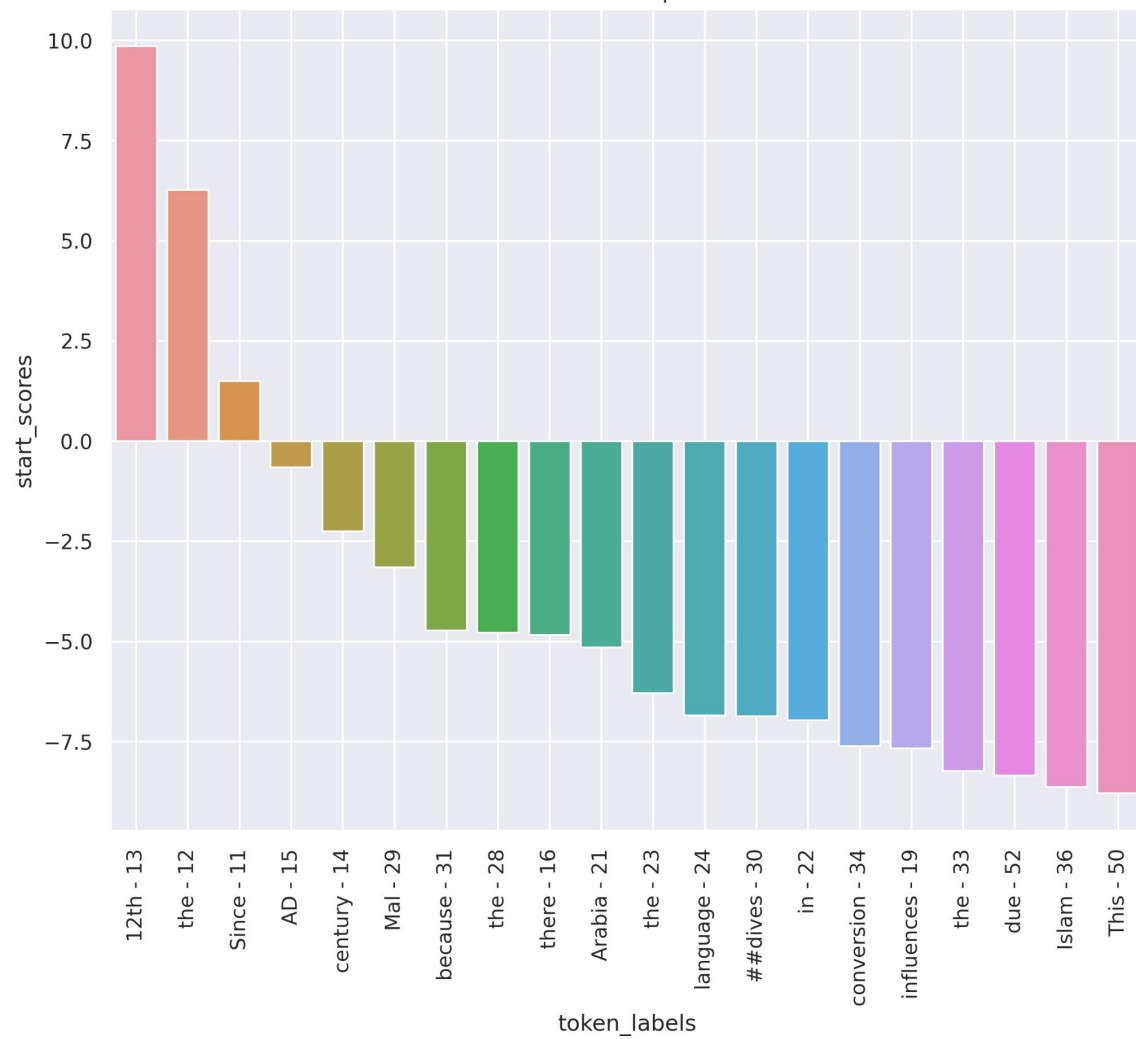
# Example 1- Correct Answer

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- **Question:** Arabia has influenced the language since what century?
- **Context:** Since the 12th century AD there were also influences from Arabia in the language and culture of the Maldives because of the ...
- **Predicted answer:** 12th century AD
- **Actual answer:** 12th century AD



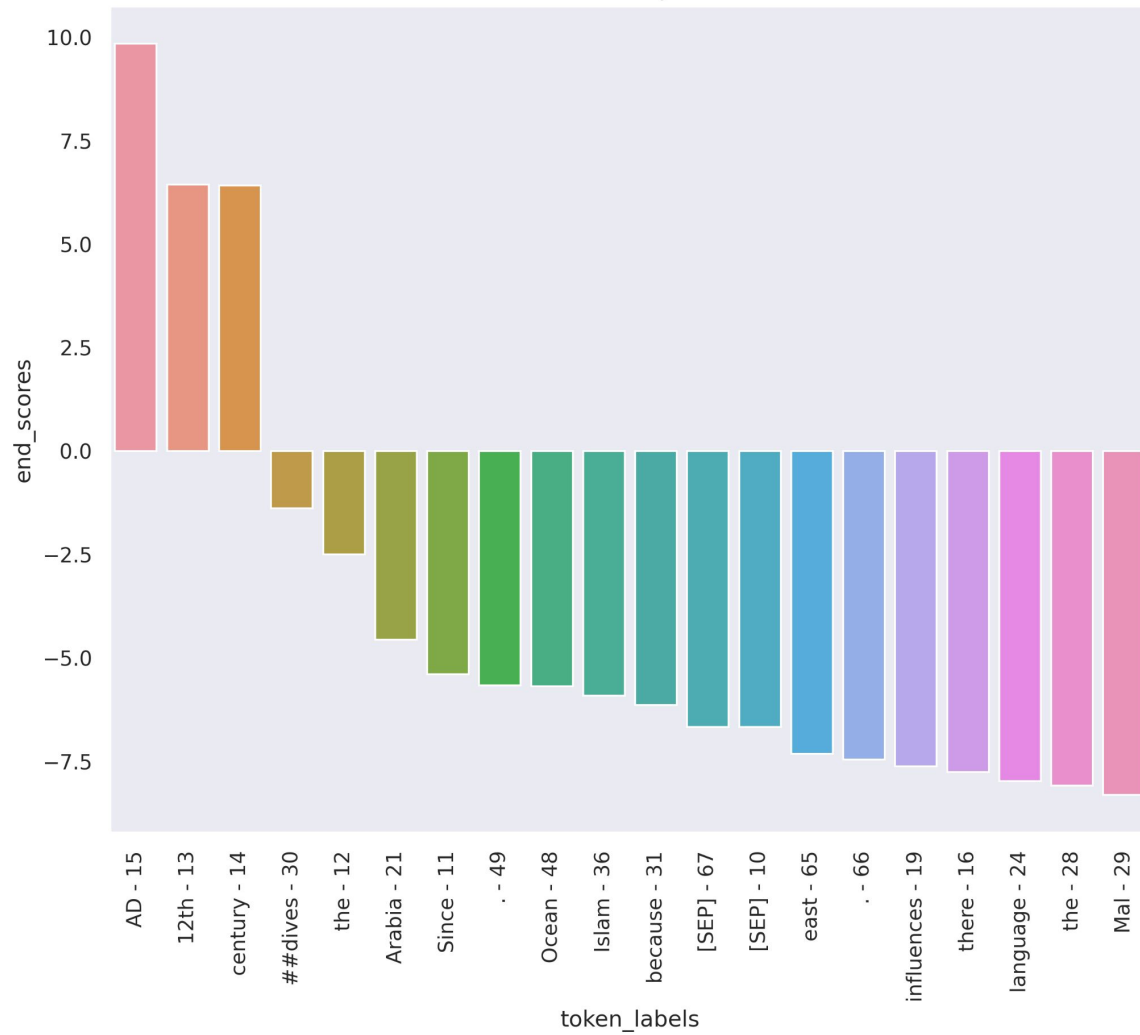
Start scores for top 20 tokens







End scores for top 20 tokens

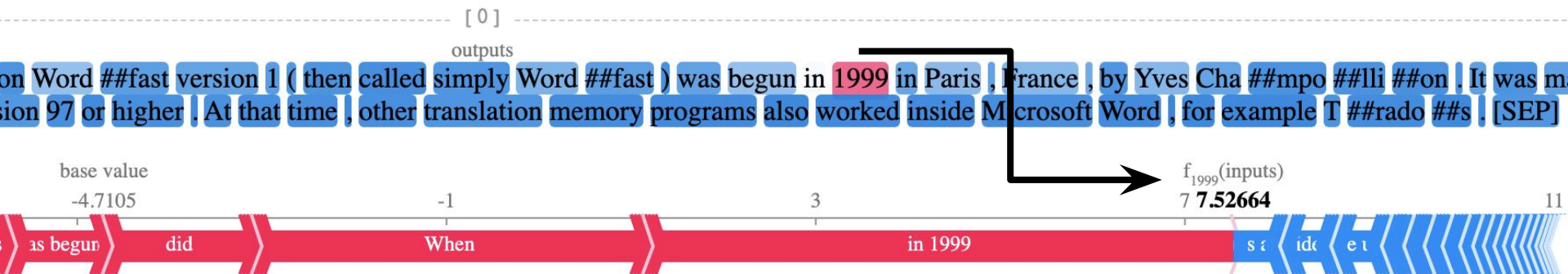


# Example 2- Correct Answer

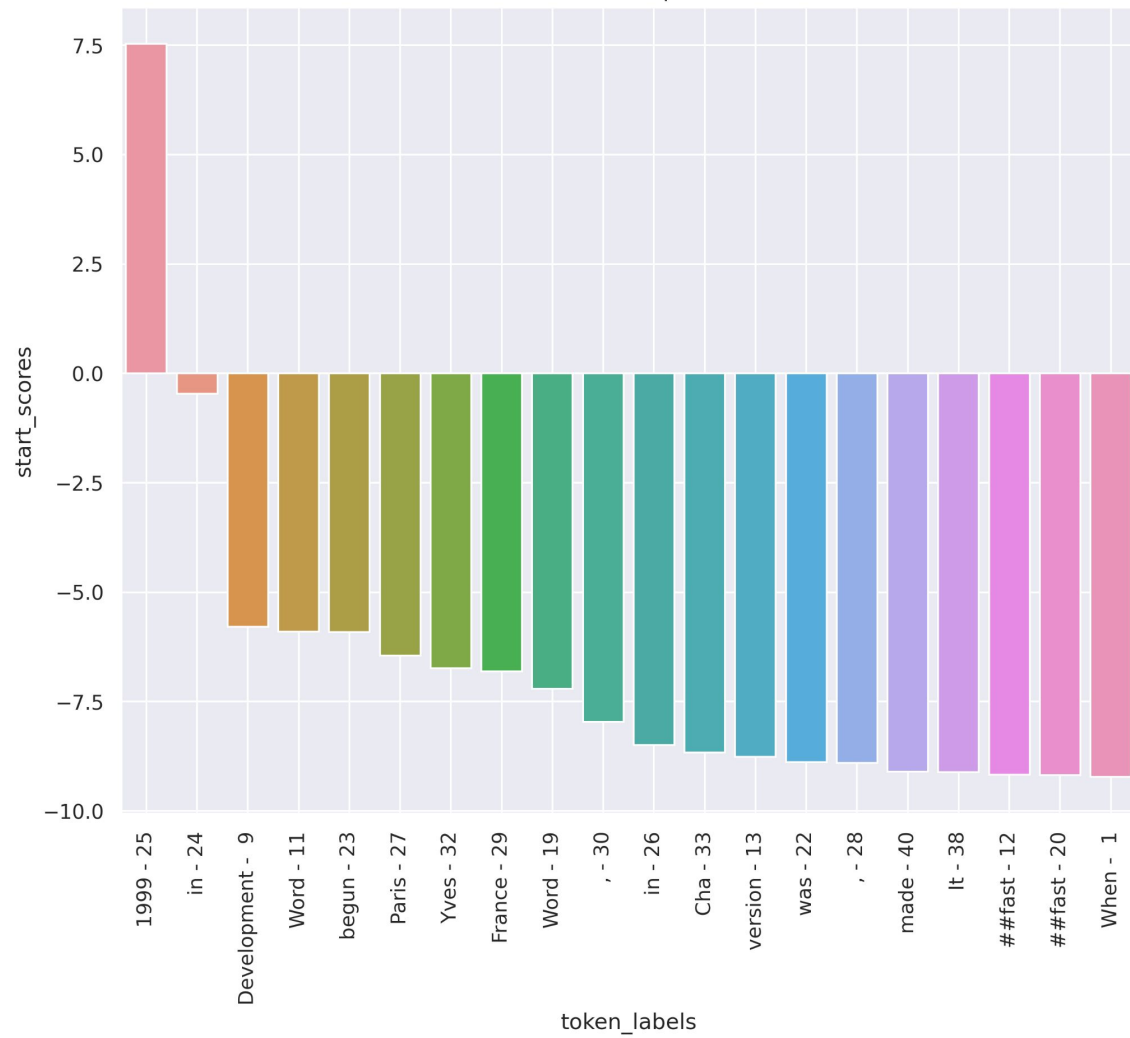
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- **Question:** When did development begin in Paris?
- **Context:** Development on Wordfast version 1 (then called simply Wordfast) was begun in 1999 in Paris, France, by Yves ...
- **Predicted answer:** 1999
- **Actual answer:** 1999

# Example 2- Start Token



Start scores for top 20 tokens

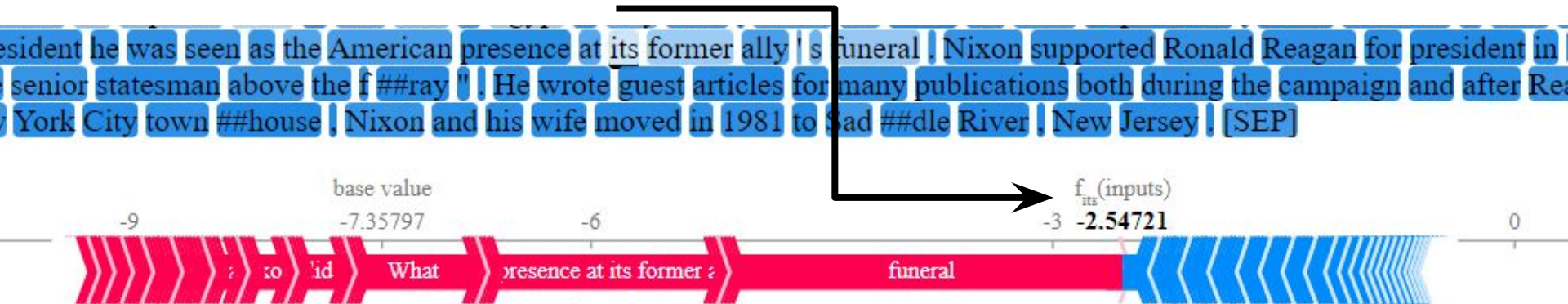


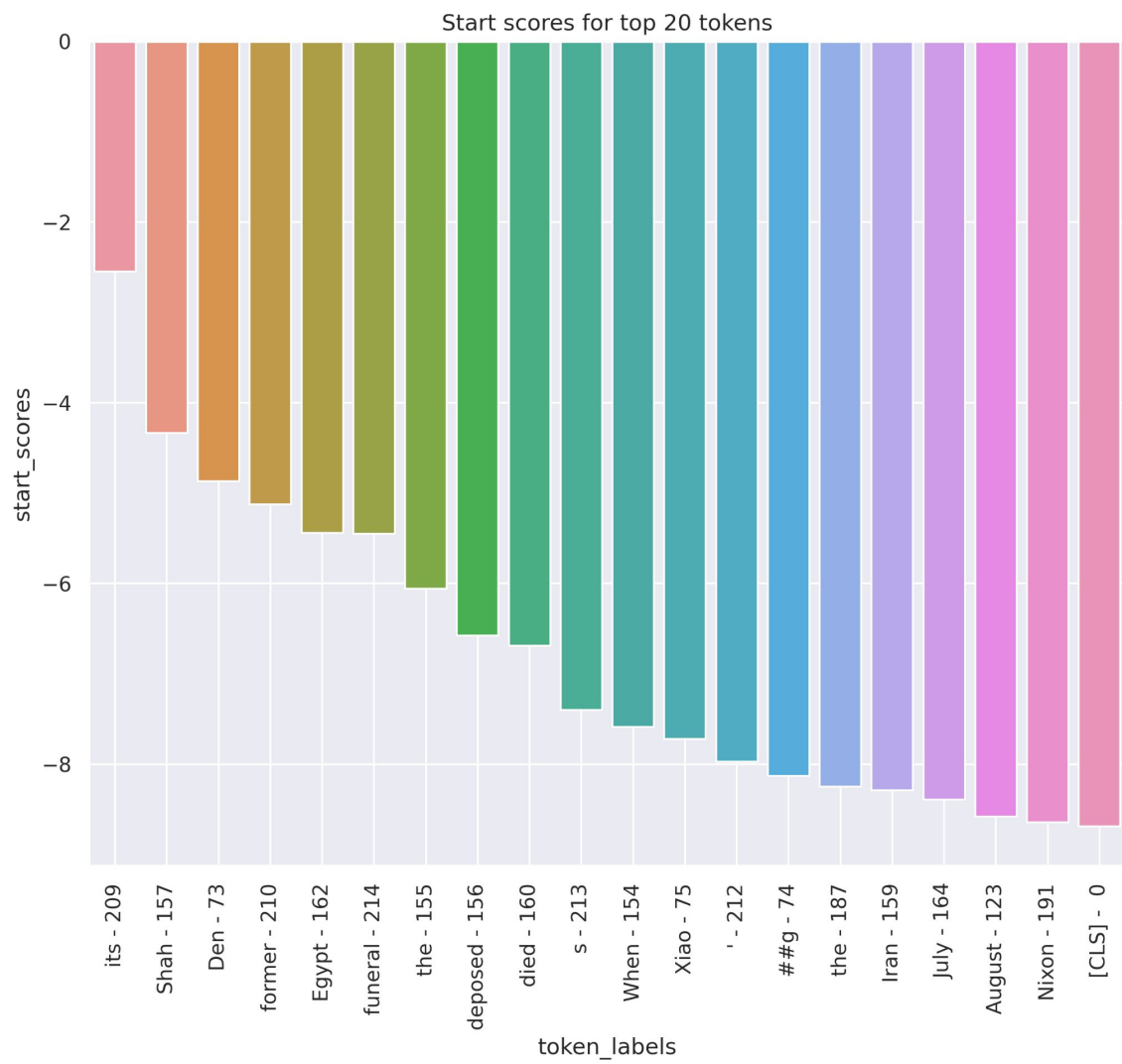
# Example 3- Incorrect Answer

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- **Question:** What funeral did Nixon attend?
- **Context:** In 1978, Nixon published his memoirs, RN: The Memoirs of Richard Nixon, the first of ten books he was to author in his retirement ...
- **Predicted answer:** its former ally's
- **Actual answer:** Shah of Iran

# Example 3- Start Token





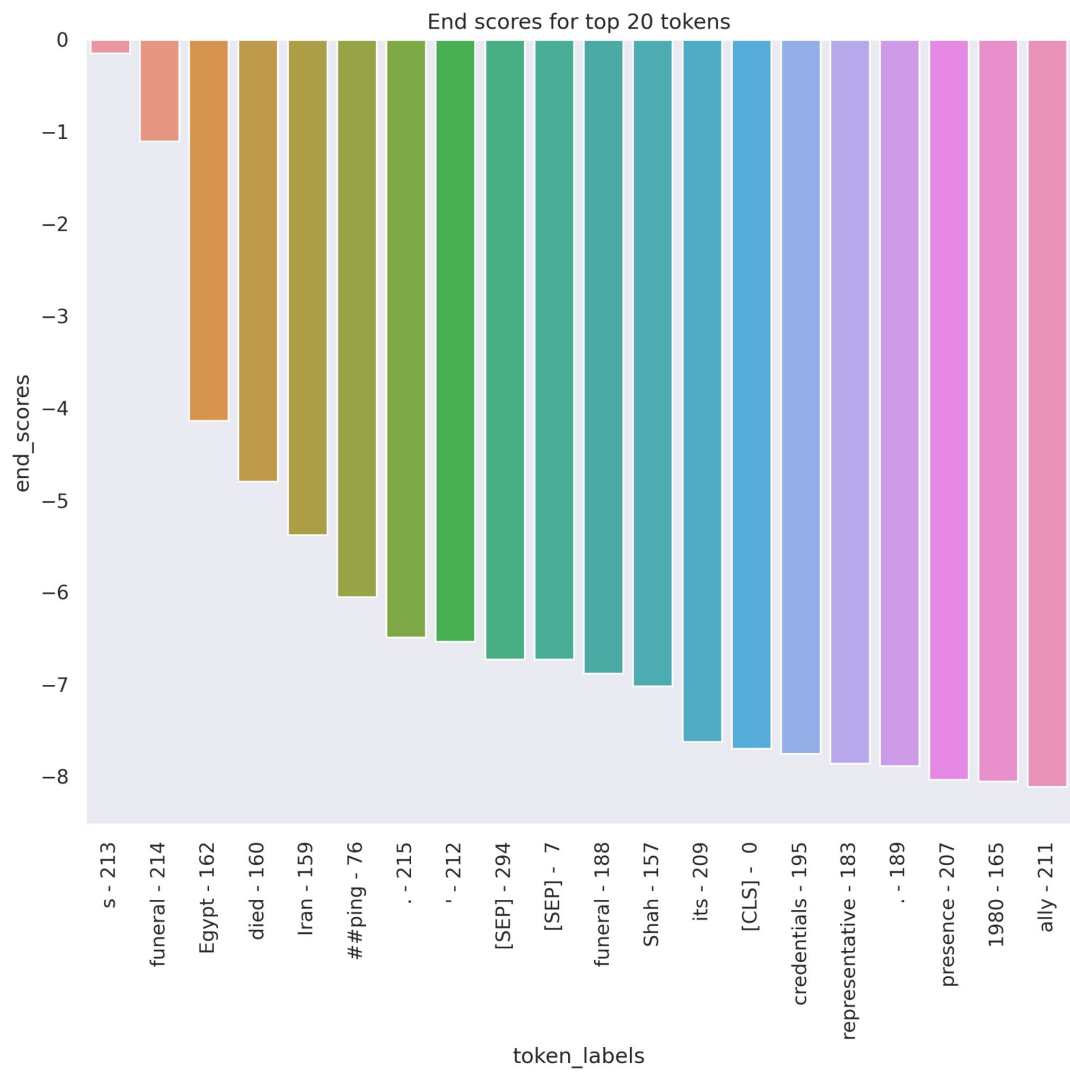
# Example 3- End Token

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was seen as the American presence at its former ally's funeral. Nixon supported Ronald Reagan for president in 1980. A spokesman above the fray. He wrote guest articles for many publications both during the campaign and after Reagan's death. Nixon and his wife moved in 1981 to Sadler River, New Jersey. [SEP]







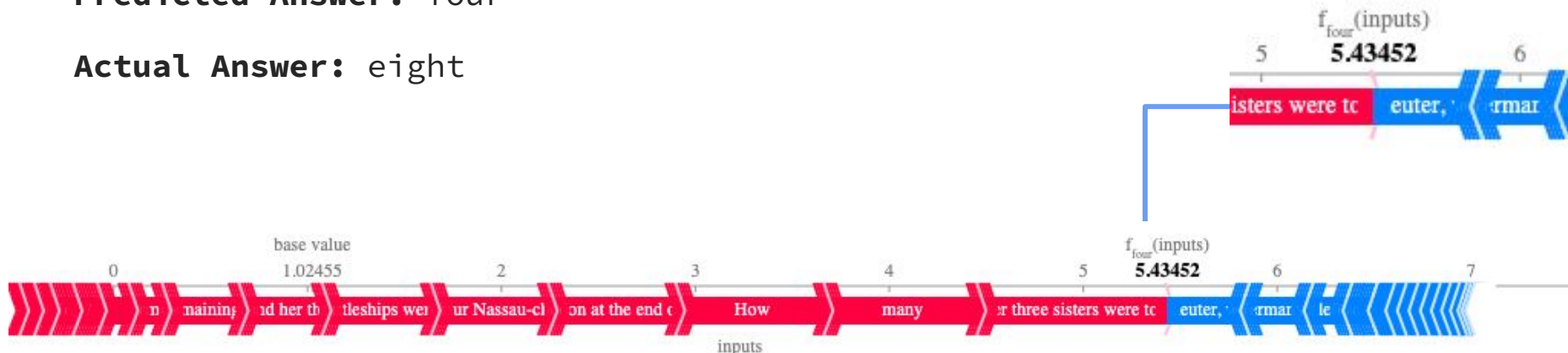
# Example 4- Incorrect Answer (Special case)

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**Question:** How many German battleships were remaining?

**Predicted Answer:** four

**Actual Answer:** eight



# Example 4- Special case

Actual Answer= eight

Text Clues for the answer

- “Thüringen and her three sisters”
- “sailors on Thüringen”

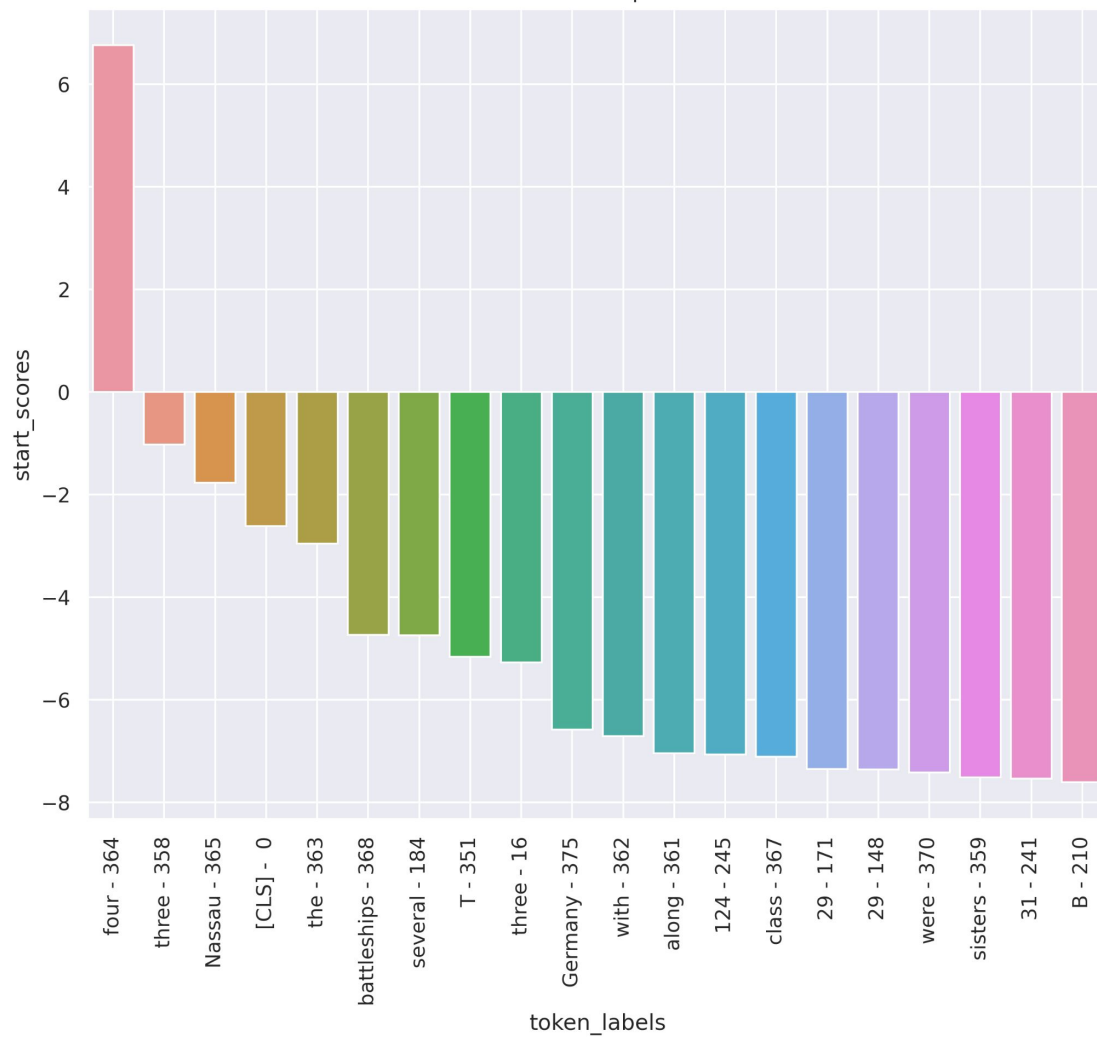
Answer in the text

Thüringen and her three sisters, along with the four Nassau-class battleships

Human processing of textual information

- 1) Remember that Thüringen has 3 sisters.
- 2) Understand that Thüringen is a German boat, and, assume that the 3 sisters are boats as well.
- 3) Compute a sum of Thüringen, the 3 sisters and the 4 Nassau-class battleships.

Start scores for top 20 tokens



# Limitations and Learned Outcomes

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- SHAP documentation
- BERT only accepts 512 tokens, had to shorten some contexts

# References

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Lewis, P., Oğuz, B., Rinott, R., Riedel, S., & Schwenk, H. (2019). MLQA: Evaluating Cross-lingual Extractive Question Answering. *ArXiv, abs/1910.07475*.