NLP/ASR

Unit 3: Transfer Learning for NLP

3.1.2

Introduction to Transfer Learning

Using pre-trained models for QA tasks

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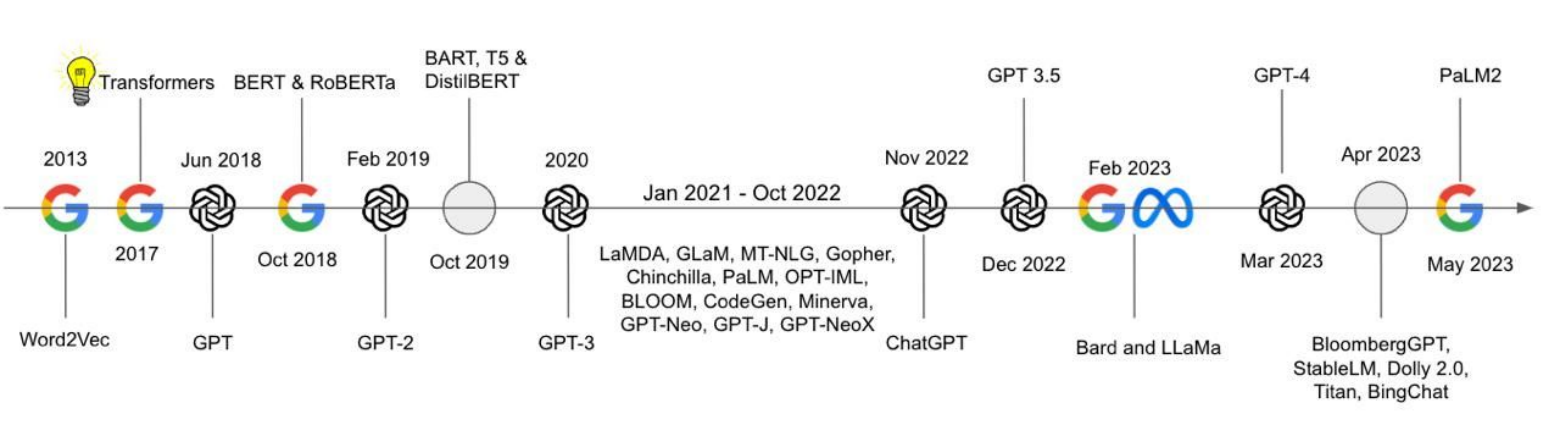
What are Pre-trained Models

- Pre-trained models are massive deep learning models trained on enormous text datasets
- They have learned to represent language effectively



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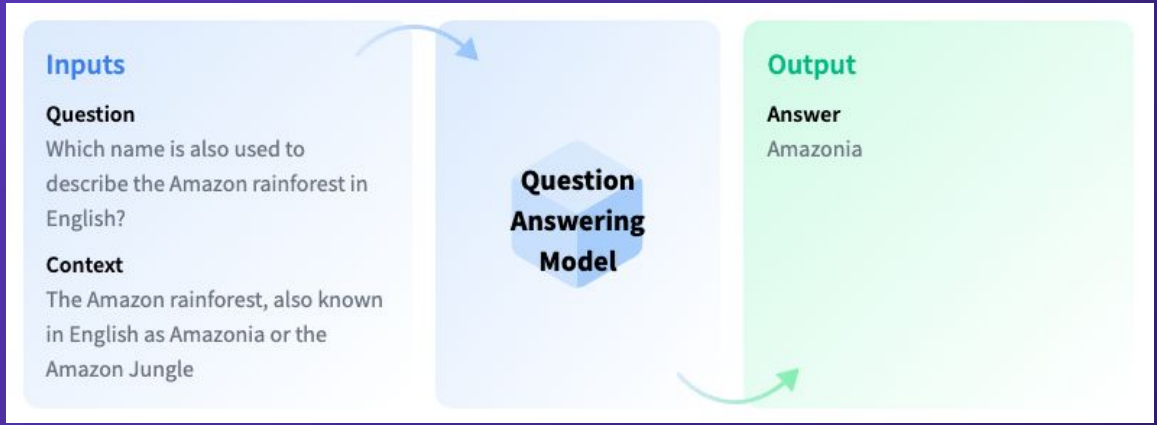
Introduction to Question Answering

- Question Answering models can retrieve the answer to a question from a given text

- Useful for searching for an answer in a document



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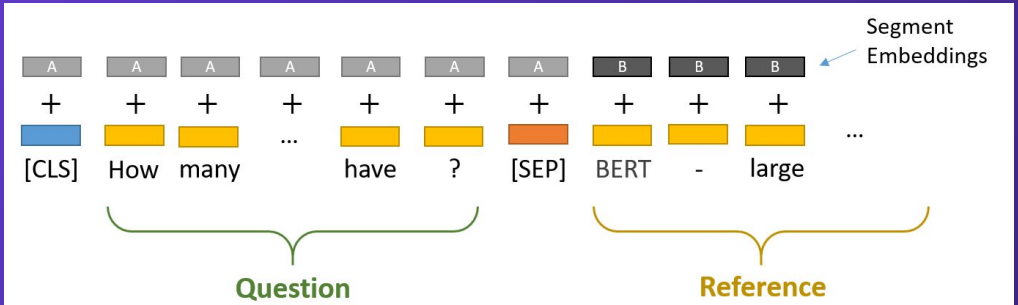
Fine-Tuning for Question Answering

- Add a question-answering "head" layer to the pre-trained model
- Fine-tune on a question-answering dataset (e.g., SQuAD)
- The model learns to identify answer spans within a given passage

BERT

- Input question and reference text are separated using a [sep] token
- Fine-tune on a question-answering dataset (e.g., SQuAD)



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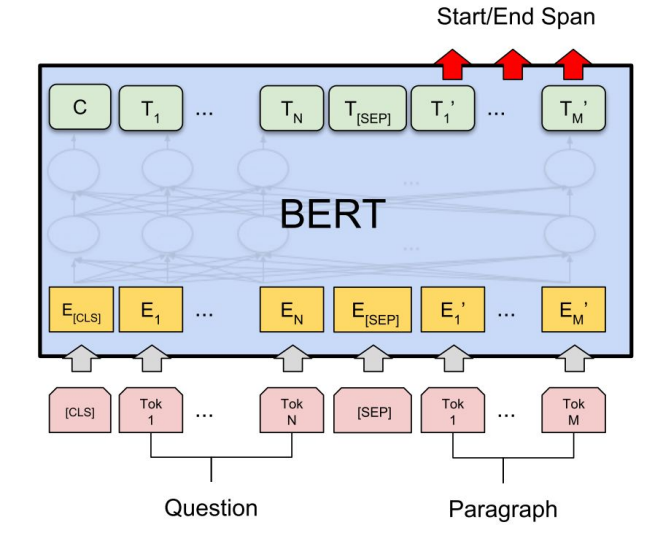


```
# Load a pre-trained BERT model and tokenizer
tokenizer = BertTokenizer.from_pretrained('bert-large-uncased-whole-word-masking-finetuned-squad')
model = BertForQuestionAnswering.from_pretrained('bert-large-uncased-whole-word-masking-finetuned-squad')
```

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LLMs for Question Answering

- Large Language Models (LLMs) can be used to find answers in two primary ways:
  - Knowledge retrieval: LLMs search through a massive database of text to find relevant passages
  - Generative responses: LLMs can creatively compose answers, even if the exact information isn't found in a text source

- Open source LLMs for QA:
  - Falcon
  - Llama2
  - Bloom
  - MPT
  - Vicuna (lightweight)

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