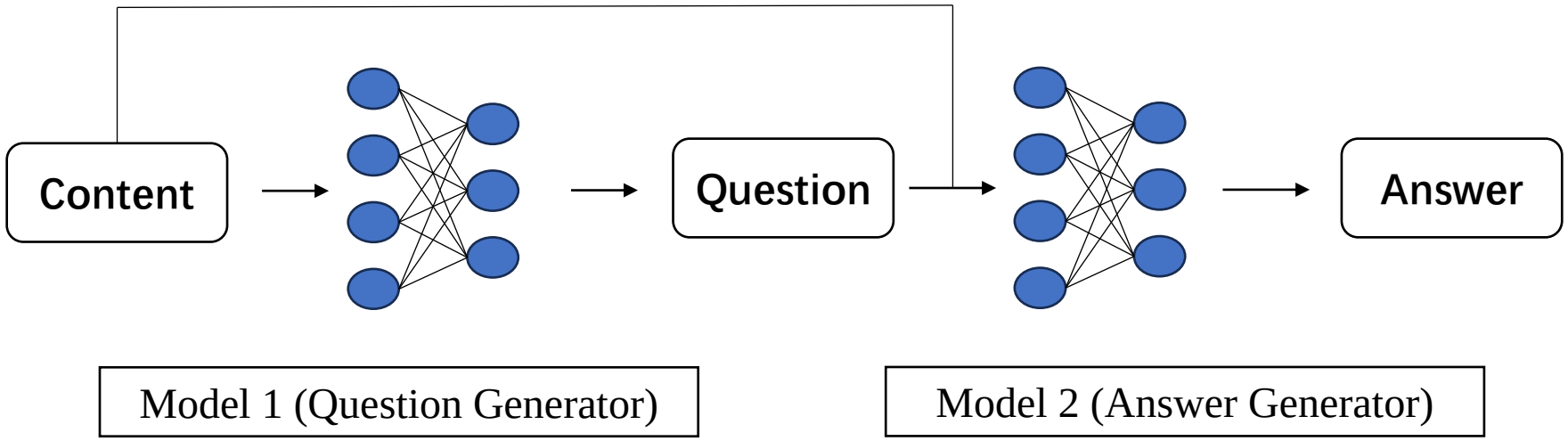
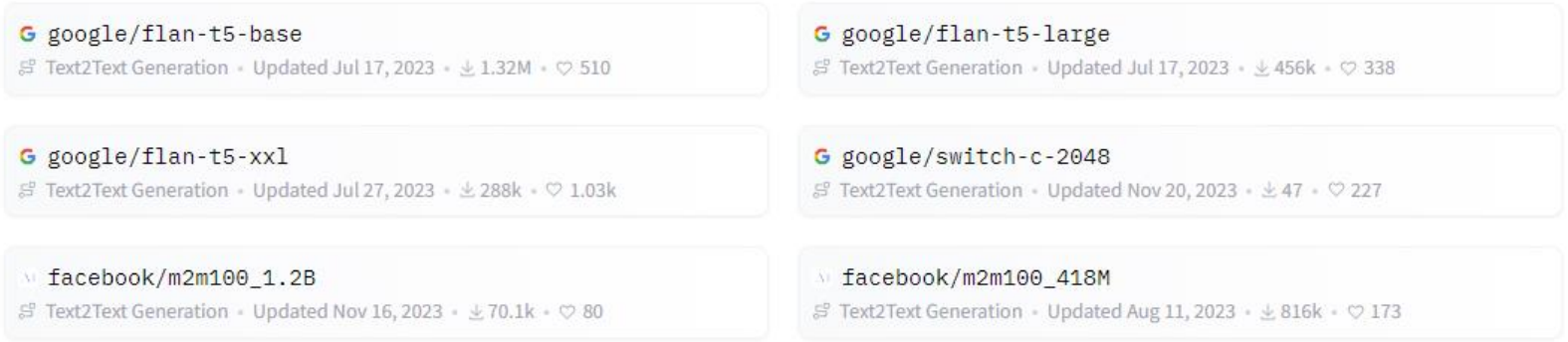
Generate Question-Answer pairs

First Idea


Content
Question
Answer
Model 1 (Question Generator)
Model 2 (Answer Generator)

First Idea



Source:Huggin Face

- **Pros**:
  Fast to run
  Free to use
- **Cons**:
  Only generate simple questions
  Cannot generate specific types of problems

Generated Questions:

1. What's the purpose of this paper?
2. What's the focus of this study?
3. What's the main idea of this paper?

...

Second Idea

```python
def generate_questions(multiple_papers_info):

    prompt = f'''
    For each paper, generate a question that belongs to the following question types. To distinguish what article each question belongs to, the question needs to mention something like the author's name, the date of publication or the title of the paper.

    Question types:
    confirmation questions, factoid-type questions, list-type questions, causal questions, hypothetical questions, complex questions

    Paper information:
    {multiple_papers_info}

    Format:
    For [Paper 1 Title]:
    Confirmation Question: [Confirmation Question]
    Confirmation Answer: [Confirmation Answer]
    PMID: [PMID]

    For [Paper 2 Title]:
    Factoid-type Question: [Factoid-type Question]
    Factoid-type Answer: [Factoid-type Answer]
    PMID: [PMID]

    For [Paper 3 Title]:
    List-type Question: [List-type Question]
    List-type Answer: [List-type Answer]
    PMID: [PMID]

    For [Paper 4 Title]:
    Causal Question: [Causal Question]
    Causal Answer: [Causal Answer]
    PMID: [PMID]

    For [Paper 5 Title]:
    Hypothetical Question: [Hypothetical Question]
    Hypothetical Answer: [Hypothetical Answer]
    PMID: [PMID]

    For [Paper 6 Title]:
    Complex Question: [Complex Question]
    Complex Answer: [Complex Answer]
    PMID: [PMID]

    Generate question and answer in the specified format.
    '''

    response = openai.ChatCompletion.create(
        model="gpt-3.5-turbo-0301",
        messages=[
                {"role": "system", "content": prompt}
            ]
    )
    return response['choices'][0]['message']['content']
```

Use gpt-3.5 api to generate questions and answers

Second Idea

Confirmation Question

- **Q:** Did the implementation of the training protocol have an effect on the child's intelligence quotient?
- **A:** Yes, the training protocol was effective in establishing relational responding and promoting fluency and flexibility in all three types of trained relations, resulting in an increase of over 1.5 SD in the General Cognitive Index of the McCarthy’s Aptitudes and Psychomotricity Scale.

Factoid-type Question

- **Q:** What cognitive deficits were found in young people at risk of developing bipolar disorder?
- **A:** Only verbal intelligence and affective response inhibition were significantly impaired in the at-risk group relative to healthy control participants, while the BD (bipolar disorder) group showed significant deficits in attention tasks compared to healthy controls.

List-type Question

- **Q:** What variables were hypothesized to be associated with lifetime blast exposure (LBE)?
- **A:** Single-item LBE, combat exposure, years in the military, number of combat deployments, and military occupation specialty (MOS).

Current Problem

GPT-3.5

GPT-3.5 models can understand and generate natural language or code. Our most capable and cost effective model in the GPT-3.5 family is `gpt-3.5-turbo` which has been optimized for chat using the Chat Completions API but works well for traditional completions tasks as well.

MODEL	DESCRIPTION	CONTEXT WINDOW	TRAINING DATA
`gpt-3.5-turbo-1106`	New **Updated GPT 3.5 Turbo** The latest GPT-3.5 Turbo model with improved instruction following, JSON mode, reproducible outputs, parallel function calling, and more. Returns a maximum of 4,096 output tokens. Learn more.	16,385 tokens	Up to Sep 2021
`gpt-3.5-turbo`	Currently points to `gpt-3.5-turbo-0613`.	4,096 tokens	Up to Sep 2021
`gpt-3.5-turbo-16k`	Currently points to `gpt-3.5-turbo-0613`.	16,385 tokens	Up to Sep 2021
`gpt-3.5-turbo-instruct`	Similar capabilities as GPT-3 era models. Compatible with legacy Completions endpoint and not Chat Completions.	4,096 tokens	Up to Sep 2021
`gpt-3.5-turbo-0613`	Legacy Snapshot of `gpt-3.5-turbo` from June 13th 2023. Will be deprecated on June 13, 2024.	4,096 tokens	Up to Sep 2021
`gpt-3.5-turbo-16k-0613`	Legacy Snapshot of `gpt-3.5-16k-turbo` from June 13th 2023. Will be deprecated on June 13, 2024.	16,385 tokens	Up to Sep 2021
`gpt-3.5-turbo-0301`	Legacy Snapshot of `gpt-3.5-turbo` from March 1st 2023. Will be deprecated on June 13th 2024.	4,096 tokens	Up to Sep 2021

Source: OpenAI

The limitation of token of gpt api, we cannot generate questions based on multiple papers

Further Works

- Design a better model for the first idea
- Generate question and answer pairs based on multiple articles.
- Enable more information of paper to be involved in the problem
- Make the types of problems more diverse.