

MAIS 202 - Project Deliverable 3

The screenshot shows a web browser window with the URL `http://127.0.0.1:7860`. The page title is "Azza Knowledge Agent". The interface features a dark theme with a central input area. At the top, there is a "question" label above a text input field. Below the input field are two buttons: a grey "Clear" button and an orange "Submit" button. Underneath these is an "output" label above another text input field. At the bottom left, there is a "Examples" section with two buttons: "Where is the Eiffel Tower?" and "What is the population of France?". At the bottom center, there is a footer with the text "Use via API" and "Built with Gradio".

question

Clear Submit

output

Examples

Where is the Eiffel Tower? What is the population of France?

Use via API · Built with Gradio

Training Results

To test our model, before and after fine-tuning and response wrapping, the metric we chose is to ask Azza. 10 different questions and see how many it gets right.

Preliminary Results

Question	Answer	Correct ? (Y/N)
Where is the Eiffel Tower?	Answer: "champ de mars in paris , france"	Y
What is the population of France?	Answer: "68 million"	Y
Where is McGill University?	Answer: "montreal , quebec , canada"	Y
Who is Robert Levandowski?	I cannot answer this question	N
How many Town Halls are there in clash of clans?	I cannot answer this question	N
When was Men in Black released?	Answer: "quiet about what they have seen"	N
When did the iPhone X come out ?	Answer: "november 3 , 2017"	Y
How is a baguette made ?	Answer: "basic lean dough"	Y
When was Justin Trudeau born?	Answer: "december 25 , 1971"	Y
Who was the queen of England in 1903 ?	Answer: "queen elizabeth ii"	N

Final Results

Question	Answer	Correct ? (Y/N)
Where is the Eiffel Tower?	The Eiffel Tower is located on the Champ de Mars in Paris, France.	Y
What is the population of France?	The population of France is 68 million.	Y
Where is McGill University?	McGill University is located in Montreal, Quebec, Canada.	Y
Who is Robert Levandowski?	who currently plays as a striker for	Y

	English club Leicester City.	
How many Town Halls are there in clash of clans?	In Clash of Clans, there are 11 Town Hall levels from Town Hall 1 to Town Hall 11.	N
When was Men in Black released?	Men in Black was released in 1997, during the fifth season of films.	Y
When did the iPhone X come out ?	The iPhone X came out on September 16, 2016.	Y
How is a baguette made ?	A baguette is made from a basic lean dough that consists of just four ingredients: flour, water, yeast, and salt. The dough is kneaded, allowed to rise, and then shaped into a long, thin loaf that is then slashed with a sharp knife. It is then baked in a hot oven until golden brown and crusty.	Y
When was Justin Trudeau born?	Justin Trudeau was born on December 25, 1971.	Y
Who was the queen of England in 1903?	In 1903, Queen Elizabeth I of England was Queen. She was the reigning monarch from November 17, 1901 until her death on May 22, 1910.	N

Final Demonstration Proposal

Our final product is a conversational agent that can find accurate context from online articles and answer questions based on that context. We achieved this by utilizing the Stanford Question Answering Dataset (SQuAD), a diverse dataset containing over 100,000 questions and answers, for training and evaluating our machine reading comprehension tasks. The agent employs a key-phrase extraction model to identify crucial words or phrases in the user's question and then retrieves the relevant Wikipedia article using the Wikipedia API.

Our integration approach can be divided into the following steps:

1. Key-phrase extraction from the user's question.
2. Retrieval of the relevant Wikipedia article based on the extracted key-phrase.
3. Tokenization of the question and context.
4. Evaluation of the model and extraction of answer tokens.
5. Reconstruction of the answer from the tokens.

6. Wrap the answer with a generative language model for a better response.

The technology stack we used for this project includes:

- Python programming language for developing the agent.
- Hugging Face's Transformers library for the pre-trained models and tokenizers.
- Gradio library for the interactive web interface.
- Wikipedia API for accessing the Wikipedia articles.
- OpenAI model for wrapping the response for the user
- Hugging Face Spaces for deploying our model.

We chose these technologies because they are widely used and well-supported in the NLP community, providing a high level of compatibility and ease of use.

The following diagram shows the workflow of our conversational agent:

