601.465/665 — Natural Language Processing
Homework 8: Large Language Models

Prof. Jason Eisner — Fall 2025
Due date: Sunday 7 December, 11:59 pm

In this homework,[1] you will make use of a large language model (LLM) server through its public API only. It is possible to build very capable systems by leaning on this resource, especially if you are thoughtful about how you make use of the API to solve your problem.

Homework goals: This homework exposes you to a number of design patterns in black-box use of LLMs.
This homework also exposes you to some issues in natural language discourse, such as turn-taking, conversational style, the relationships among claims, and properties of successful conversations.
After completing it, you should be comfortable with configuring and calling an LLM server, using some of the more common API calls and parameters (via their Python bindings), and thinking about usage costs and their tradeoffs.
You should have a sense of what current LLMs are capable of and how to prompt them. You should know how to compute linguistic functions via few-shot prompting, and all of the steps of retrieval-oriented generation. You should know how model-based evaluation works (and what its weaknesses are).

Collaboration: ***You may work in pairs on this homework.*** That is, if you choose, you may collaborate with one partner from the class, handing in a single homework with both your names on it. However:

(a) You should do all the work *together*, for example by pair programming. Don't divide it up into "my part" and "your part."
(b) Your submission to Gradescope should describe at the top what each of you contributed, so that we know you shared the work fairly.
(c) Your partner for Homework 8 can't be the same as your partner from Homeworks 6–7.

In any case, observe academic integrity and never claim any work by third parties as your own.

Materials: Download the zipfile from `http://cs.jhu.edu/~jason/465/hw-llm/` and unpack it. Then use your IDE to open the notebook `hw-llm.ipynb` (here's a preview), which will guide you through the homework.

Some tips about Jupyter notebooks were given here. To open a notebook in VSCode, select `Create: New Jupyter Notebook` from the Command Palette (`Ctrl+Shift+P`). Or you can open it in your browser: type `jupyter` at the command line (assuming you've installed `conda`).

Reading: There is no reading handout or background reading for this homework, other than the notebooks and starter code.

Hand-in instructions: We'll send these out soon. Probably we will ask you to submit a version of the main notebook, with your answers added and unrelated cells deleted. We may also ask for a summary. And you'll have to submit any `.py` files you changed (in particular `argubots.py`).

[1] Many thanks to Camden Shultz and Brian Lu for help putting this homework together.

OLD VERSION