

h(AI)ck.py 2025

Problem Statement

Meet Vaishnavi, your free-spirited best friend and a remarkable student who excels in juggling her Law and Business studies at her Management School. Known for her vibrant personality, Vaishnavi is the life of the party, often found skipping classes, socializing, and living life to the fullest. Despite her fun-loving nature, she consistently tops her class with an impressive GPA of 3.9/4.0, all thanks to her exceptional note-making skills.

However, Vaishnavi now finds herself in a bit of a predicament. The sudden rescheduling of her college's end-semester exams has left her with an intense time crunch. She needs to prepare comprehensive notes for seven subjects within just three days—a Herculean task by any measure.

In a bid to manage this daunting workload, Vaishnavi turned to various online GPT tools like ChatGPT and NotebookLLM. Unfortunately, she encountered a roadblock—the free versions of these tools come with a 25MB upload limit per PDF, and the premium versions are prohibitively expensive. The thought of copy-pasting paragraphs from textbooks is impractical due to the sheer volume of content and limited time available.

In this moment of academic crisis, Vaishnavi turns to you, her tech-savvy best friend. With your expertise in AI technologies, you confidently assure her that you will create the notes she needs within 24 hours. She provides you with three textbooks and requests that you build a question-answering machine that can help her ask questions and get precise answers for her studies.

Understanding the task at hand, you decide to fine-tune a Large Language Model (LLM) to achieve an unreal level of precision in answering questions. You opt for a model that is not too large, as Vaishnavi plans to use your software for future note-making endeavours as well. To demonstrate the precision required, she even gives you two sample questions.

With your skills in fine-tuning and expert prompt engineering, you are now set to embark on this challenging mission to help Vaishnavi ace her exams!

Workflow Overview and our suggestions

- Set Up Google Colab, If you can't run and train LLMs locally on your computer
- Data Preparation- Use pdf reading tools to make the dataset
- Model Selection – Try smaller models on HuggingFace – distilBERT, T5, GPT, GPT-2, Llama 1B models etc etc
- Fine-Tuning the Model – This takes a lot of time
- Testing and Evaluation – Show off your prompt engineering skills here
- Deploying the Model as an API – Use FASTAPI
- Integrating with a Local Server
- Creating a User Interface – This need not be way too complex

A Few Additional Notes:

Model Access Approval: During model selection on Hugging Face, sometimes approval for access to model repositories might take time. Keep this in mind when selecting models.

Google Colab Limitations: Google Colab has GPU utilization limits, so be mindful of this. The RAM limit is relatively low (12GB), so choose models that are around 7-8 GB to ensure they run smoothly.

The sample Questions that she gave you. (This will help you in prompt engineering)

Jurisprudence, Interpretation and general laws:

1. According to Bentham “every law may be considered in eight different aspects”. Discuss.

Jeremy Bentham was the pioneer of analytical jurisprudence in Britain. According to him ‘a law’ may be defined as an assemblage of signs, declarative of volition, conceived or adopted by a sovereign in a state, concerning the conduct to be observed in a certain case by a certain person or a class of persons, who in the case in question are or are supposed to be subject to his power. Thus, Bentham’s concept of law is an imperative one.

Bentham said that every law may be considered in eight different respects:

1. **Source:** The source of a law is the will of the sovereign, who may conceive laws which he personally issues, or adopt laws previously issued by sovereigns or subordinate authorities, or he may adopt laws to be issued in future by subordinate authorities. Sovereign according to Bentham is any person or assemblage of person to whose will a whole political community is supposed to be in a disposition to pay obedience, and then in preference to the will of any other person.
2. **Subjects:** These may be persons or things. Each of these may be active or passive subjects, i.e., the agent with which an act commences or terminates.
3. **Objects:** The goals of a given law are its objects.
4. **Extent:** Direct extent means that a law covers a portion of land on which acts have their termination; indirect extent refers to the relation of an actor to a thing.
5. **Aspects:** Every law has ‘directive’ and a ‘sanctional’ part. The former concerns the aspects of the sovereign will towards an act-situation and the latter concerns the force of a law. The four aspects of the

sovereign will are command, prohibition, non-prohibition and non-command and the whole range of laws are covered under it. These four aspects are related to each other by opposition and concomitancy.

6. Force: The motivation to obey a law is generated by the force behind the law.

7. Remedial appendage: These are a set of subsidiary laws addressed to the judges through which the judges cure the evil (compensation), stop the evil or prevent future evil.

8. Expression: A law, in the ultimate, is an expression of a sovereign's will. The connection with will raises the problem of discovering the will from the expression.

2. 'Article 16 qualifies equality of opportunity in matters of public employment'. However there are certain exceptions to it. Discuss

Article 16(1) guarantees to all citizens' equality of opportunity in matters relating to employment or appointment of office under the State.

Article 16(2) prohibits discrimination against a citizen on the grounds of religion, race, caste, sex, descent, place of birth or residence.

However, there are certain exceptions provided in Article 16(3), 16(4) and 16(5). These are as under:

(1) Parliament can make a law that in regard to a class or classes of employment or appointment to an office under the Government of a State or a Union Territory, under any local or other authority within the State or Union Territory, residence within that State or Union Territory prior to such employment or appointment shall be an essential qualification. [Article 16(3)]

(2) A provision can be made for the reservation of appointments or posts in favour of any backward class of citizens which in the opinion of the State is not adequately represented in the services under the State. [Article 16(4)]

(3) The State may make a law for reservation in matters of promotion, with consequential seniority, to any class or classes of posts in the services under the State in favour of the Scheduled Castes and the Scheduled Tribes which, in the opinion of the State, are not adequately represented in the services under the State. [Article 16(4A)]

(4) The State may consider any unfilled vacancies of a year which are reserved for being filled up in that year in accordance with any provision for reservation made under clause (4) or clause (4A) as a separate class of vacancies to be filled up in any succeeding year or years and such class of vacancies shall not be considered together with the vacancies of the year in which they are being filled up for determining the ceiling of fifty per cent. reservation on total number of vacancies of that year. [Article 16(4B)]

(5) A law shall not be invalid if it provides that the incumbent of an office in connection with the affairs of any religious or denominational institution or any member of the governing body thereof shall be a person professing a particular religion or belonging to a particular denomination. [Article 16(5)]

(6) The State may make a law for the reservation of appointments or posts in favour of any economically weaker sections of citizens other than the classes mentioned in clause (4), in addition to the existing reservation and subject to a maximum of ten per cent. of the posts in each category. [Article 16(6)]

Happy Hacking!!