Fine tuning custom models

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Agenda

- Modify an existing Instruction dataset
- Fine-Tune Llama 2 Model on the Custom Data
- Evaluate the Fine-tuned model
- Push the fine-tuned model on hugging face

RAG vs. Fine-tuning

Factor	RAG	Fine-tuning
Capability	Integrates a retriever model that fetches relevant documents, which are then used by a generator model for response generation.	Directly adjusts the model's parameters based on a specific dataset to tailor its responses.
Flexibility	High flexibility in handling diverse topics by leveraging external data sources.	Tailored to specific tasks or domains, with limited flexibility for topics outside the trained dataset.
Complexity	More complex, involving both a retriever and a generator model.	Simpler, involves only the language model itself.
Relevance	Can provide more contextually relevant and current information by accessing up-to-date external sources.	Dependent on the relevance and recency of the training data, which may limit the model's ability to provide the latest information.
Customization	Less customizable in terms of model behavior due to reliance on external data sources.	Highly customizable to specific tasks or domains, allowing for more tailored responses based on training data.
Inference Speed	Slower inference due to the additional retrieval step; requires regular updating of external data sources.	Faster response generation; needs retraining or continuous fine-tuning to stay effective as the domain evolves.

Dataset Creation

- There are different types of datasets that we can use to fine-tune Large Language Models.

1. Instruction Datasets

2. Raw Completion

3. Preference Datasets

Open-Platypus
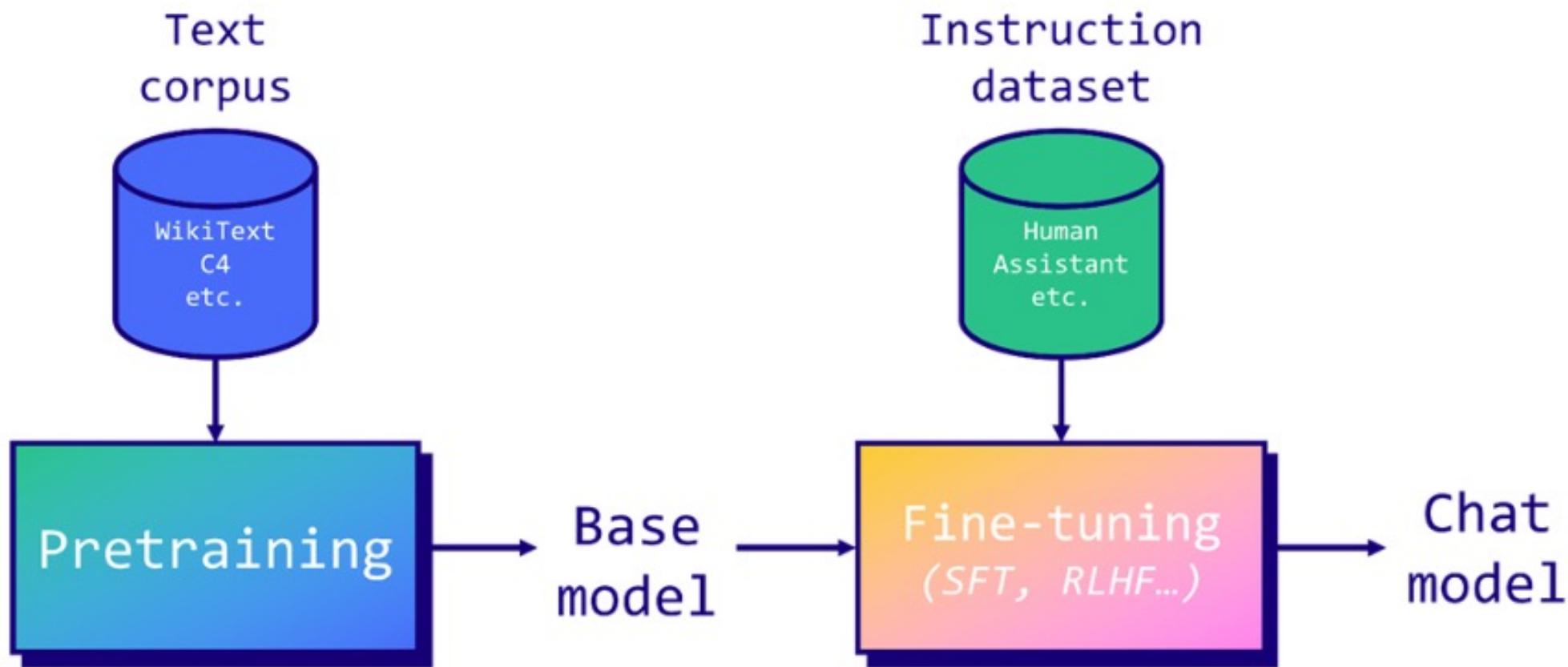
- https://huggingface.co/datasets/garage-bAInd/Open-Platypus
- This dataset is focused on improving LLM logical reasoning skills and was used to train the Platypus2 models. It is comprised of the following datasets, which were filtered using keyword search and then Sentence Transformers to remove questions with a similarity above 80%.

Dataset Name	License Type
PRM800K	MIT
MATH	MIT
ScienceQA	Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International
SciBench	MIT
ReClor	Non-commercial
TheoremQA	MIT
nuprl/leetcode-solutions-python-testgen-gpt4	None listed
jondurbin/airoboros-gpt4-1.4.1	other
TigerResearch/tigerbot-kaggle-leetcodesolutions-en-2k	apache-2.0
ARB	CC BY 4.0
timdettmers/openassistant-guanaco	apache-2.0