3-ways to Set up LLaMA 2 Locally on CPU (Part 3 — Hugging Face)

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Load LlaMA 2 model with `Hugging Face` 🚀

Install dependencies for running Llama 2 with Hugging Face locally

We need to ensure that the essential libraries are installed:

- `transformers` : Hugging Face Transformers provides APIs to quickly download and use pretrained Transformer models.
- `torch` : PyTorch provides Tensors that can live either on the CPU or the GPU

Note: PyTorch is a **GPU-Ready Tensor library.** For CPU-support only, we can conveniently install Hugging Face Transformers and PyTorch library in one command line

```
pip install 'transformers[torch]'
```

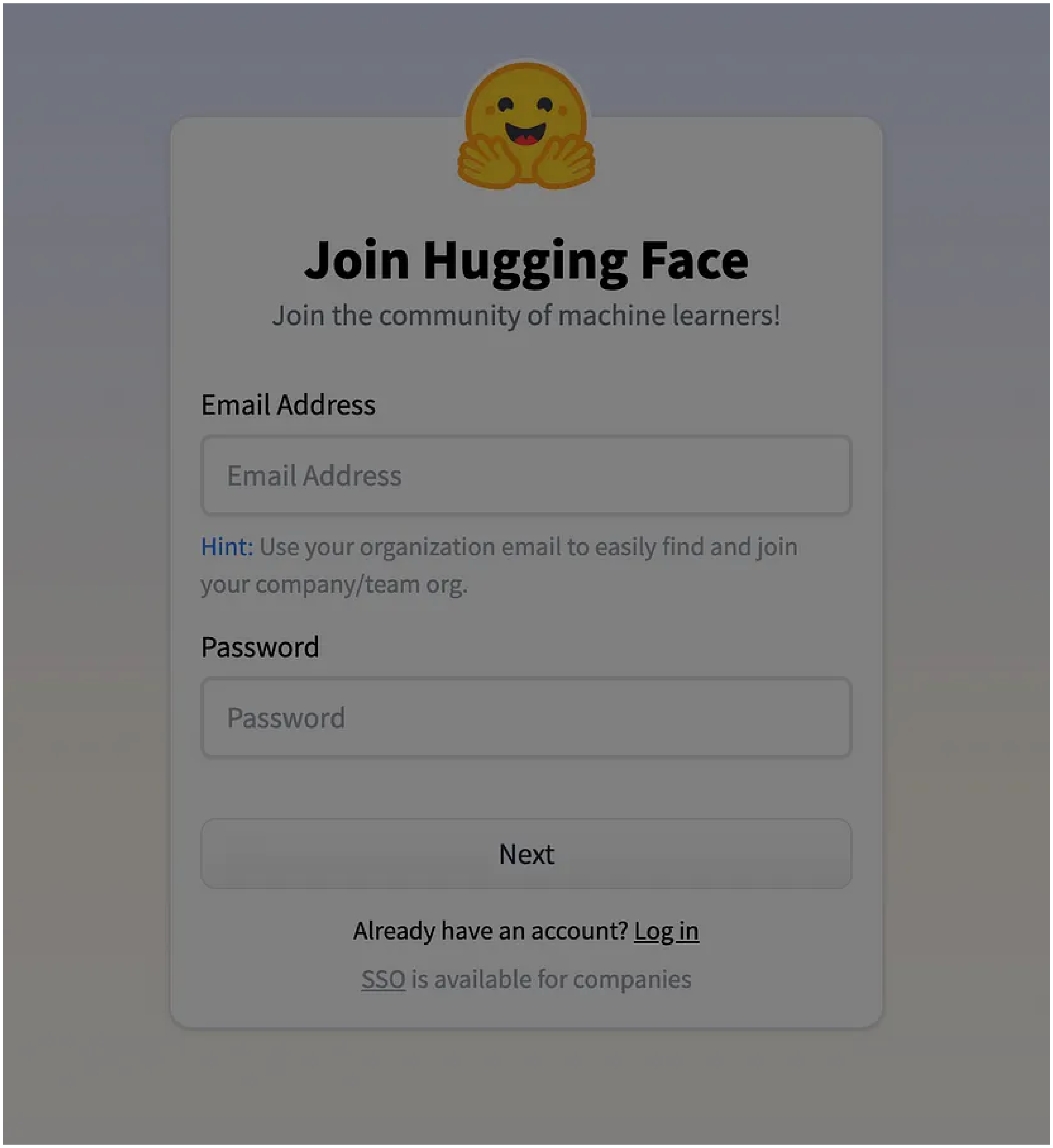
> *Explanation:*
>
> *- `pip install torch transformers` would install two packages named `torch` and `transformers`.*
>
> *- `pip install transformers[torch]`, on the other hand, installs a variant of the `transformers` package which contains* support *for `torch`. Note that it has nothing to do with the `torch` package itself, but is just a string defined by the `transformers` package for a particular **feature set** that gets enabled. How the argument `torch` is interpreted is entirely up to its `setup.py` file. (*Brackets [optional] in PIP*).*

1° First, Download the library.

```
pip3 install 'transformers[torch]'
```

2° Create an Account on **Hugging Face**

- Open a new tab and visit the Hugging Face website.
- Click on the "**Sign In**" button or sign up to Hugging Face.
- Once you have created your Hugging Face account, log in to the platform.


Join Hugging Face

Join the community of machine learners!

Email Address

Email Address

Hint: Use your organization email to easily find and join your company/team org.

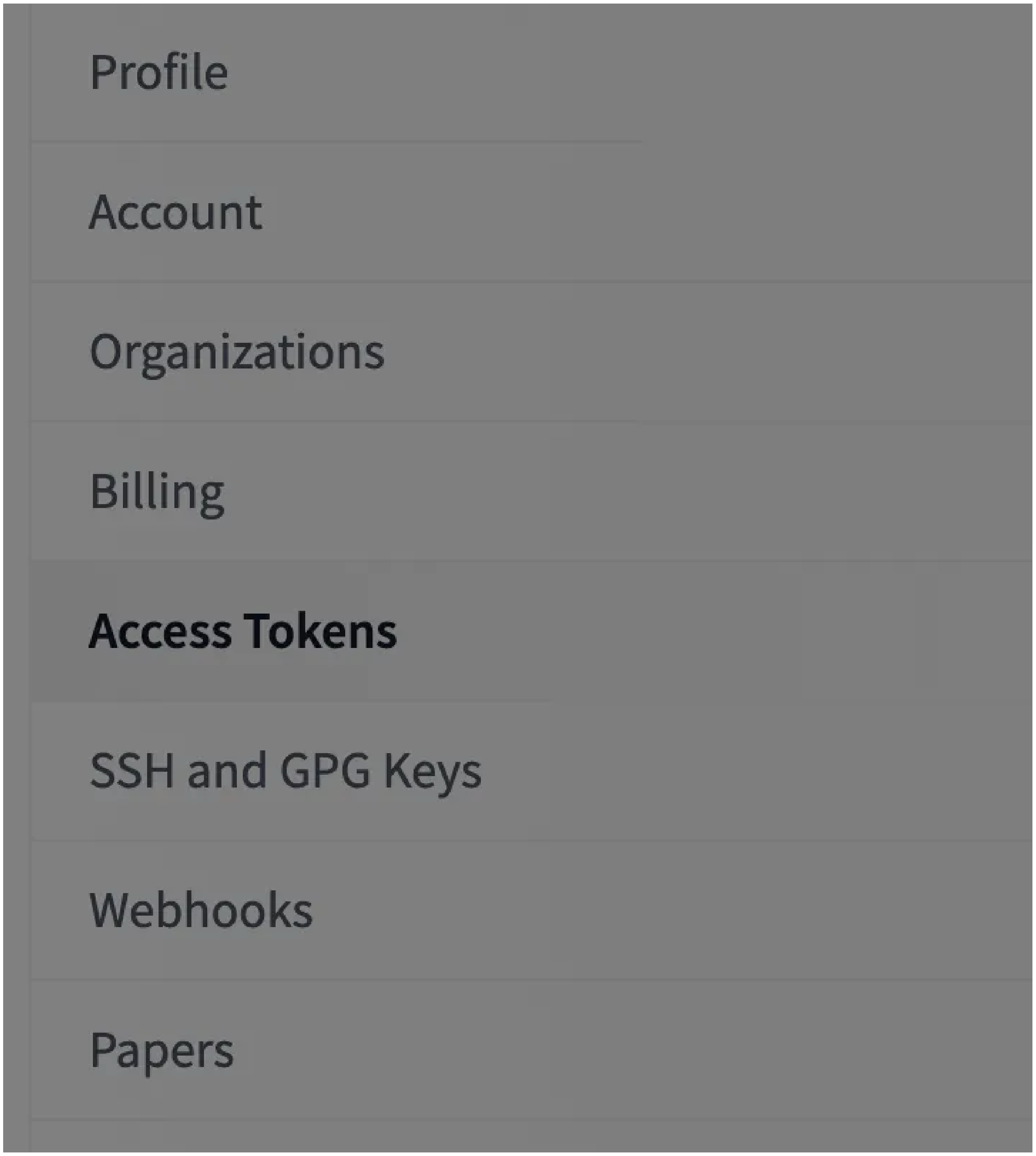
Password

Password

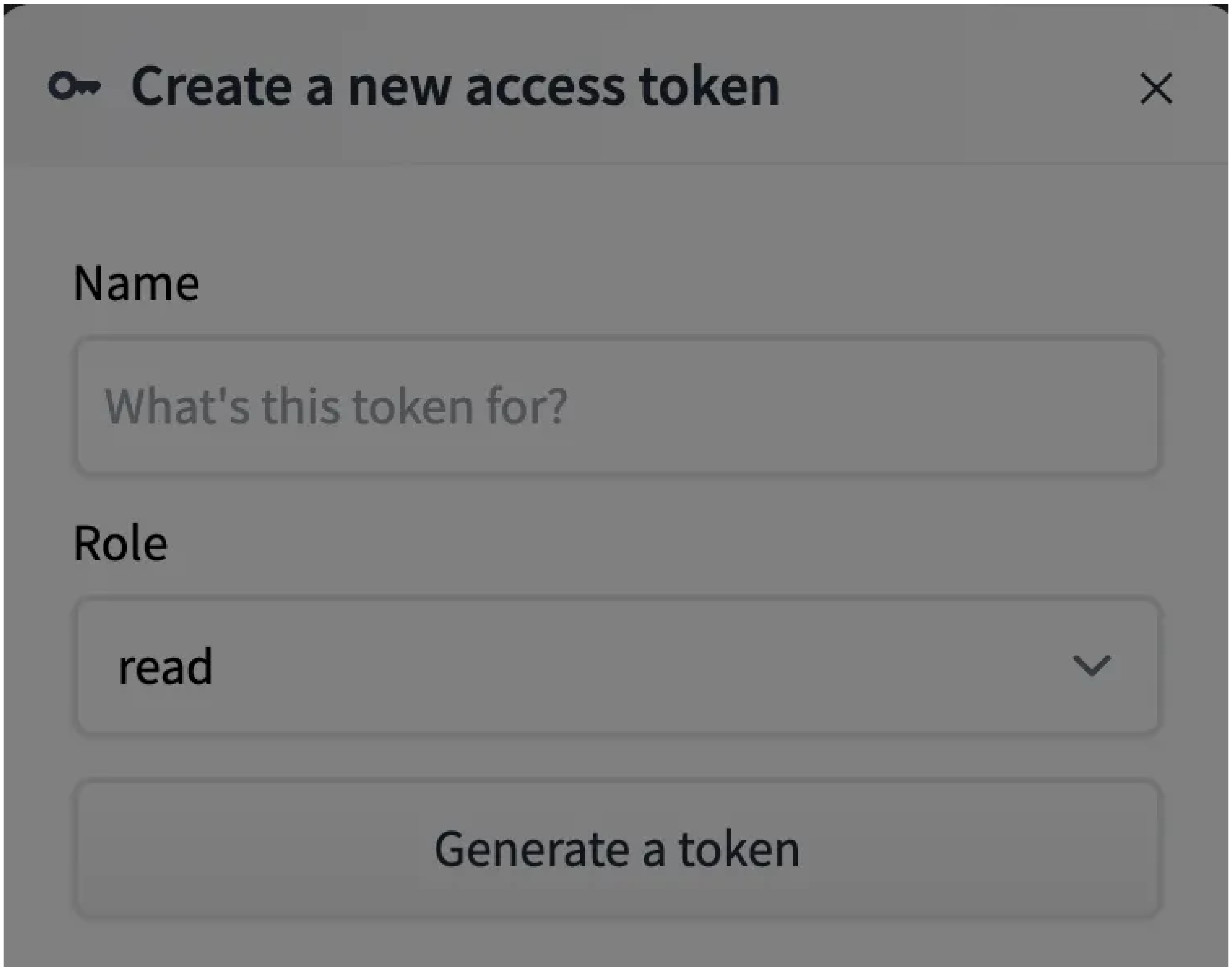
Next
Already have an account? Log in
SSO is available for companies

Obtaining the Hugging Face API Token

- Click on your profile picture at the top right corner of the page.
- Select “**Access Token**” from the dropdown menu.



- Click on the “**New Token**” button.
- Give your token a name and click on the **“Generate a token”** button.



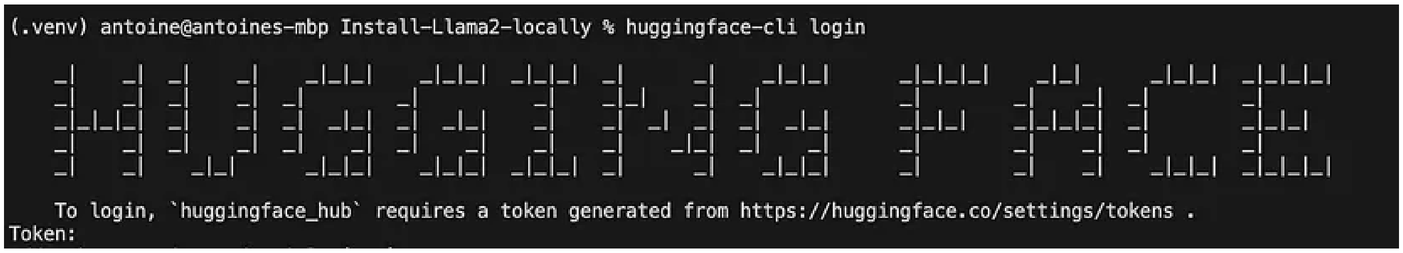
- Copy the Hugging Face API token. This token will be used to authenticate your requests to the Hugging Face API.

3° Login

Once you have an account and your token, run the following command in your terminal or in your notebook:

```
huggingface-cli login

#or

huggingface-cli login --token YOUR_TOKEN_HERE
```

This command will prompt you to enter your Hugging Face token.



```
(.venv) antoine@antoines-mbp Install-Llama2-locally % huggingface-cli login

    _|    _|  _|    _|    _|_|_|    _|_|_|  _|_|_|  _|      _|    _|_|_|      _|_|_|_|    _|_|      _|_|_|  _|_|_|_|
    _|    _|  _|    _|  _|        _|          _|    _|_|    _|  _|            _|        _|    _|  _|        _|
    _|_|_|_|  _|    _|  _|  _|_|  _|  _|_|    _|    _|  _|  _|  _|  _|_|      _|_|_|    _|_|_|_|  _|        _|_|_|
    _|    _|  _|    _|  _|    _|  _|    _|    _|    _|    _|_|  _|    _|      _|        _|    _|  _|        _|
    _|    _|    _|_|      _|_|_|    _|_|_|  _|_|_|  _|      _|    _|_|_|      _|        _|    _|    _|_|_|  _|_|_|_|

    To login, `huggingface_hub` requires a token generated from https://huggingface.co/settings/tokens .
Token:
```

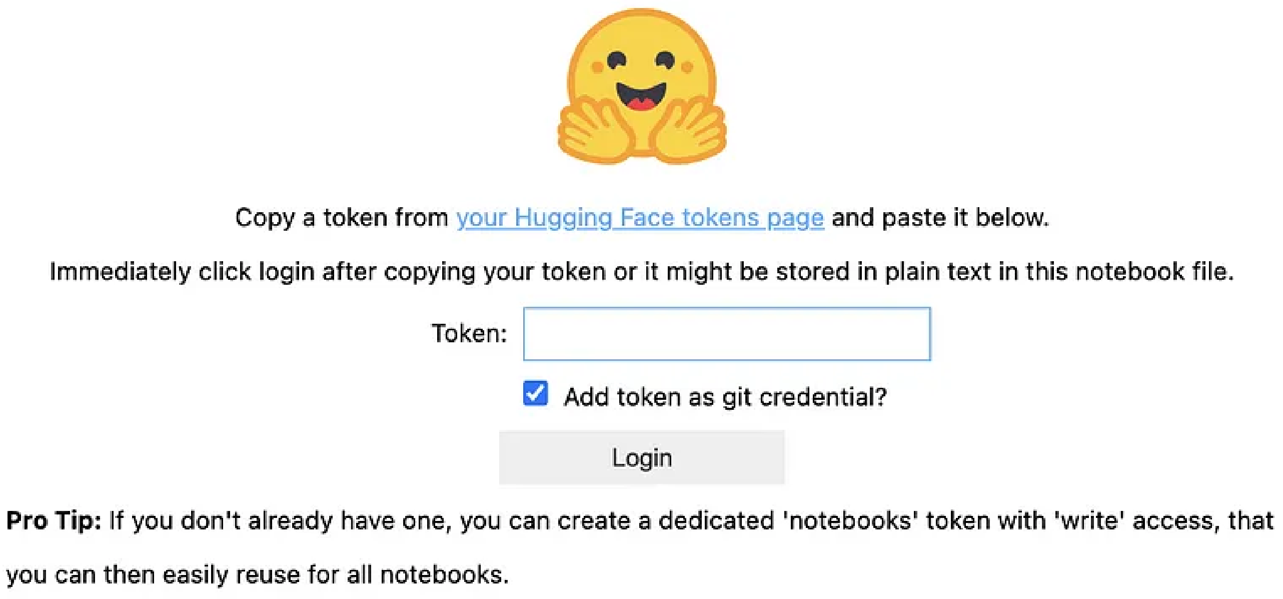
You can use the following command to check if you are logged and determine your currently active account

```
huggingface-cli whoami
```

Note: Alternatively, you can login using login() or login_notebook() in a script or a notebook:

```
#!pip3 install --upgrade huggingface_hub

from huggingface_hub import notebook_login
notebook_login()
```

You can only be logged in to one account at a time. (see more)



Copy a token from your Hugging Face tokens page and paste it below.

Immediately click login after copying your token or it might be stored in plain text in this notebook file.

Token:

✓ Add token as git credential?

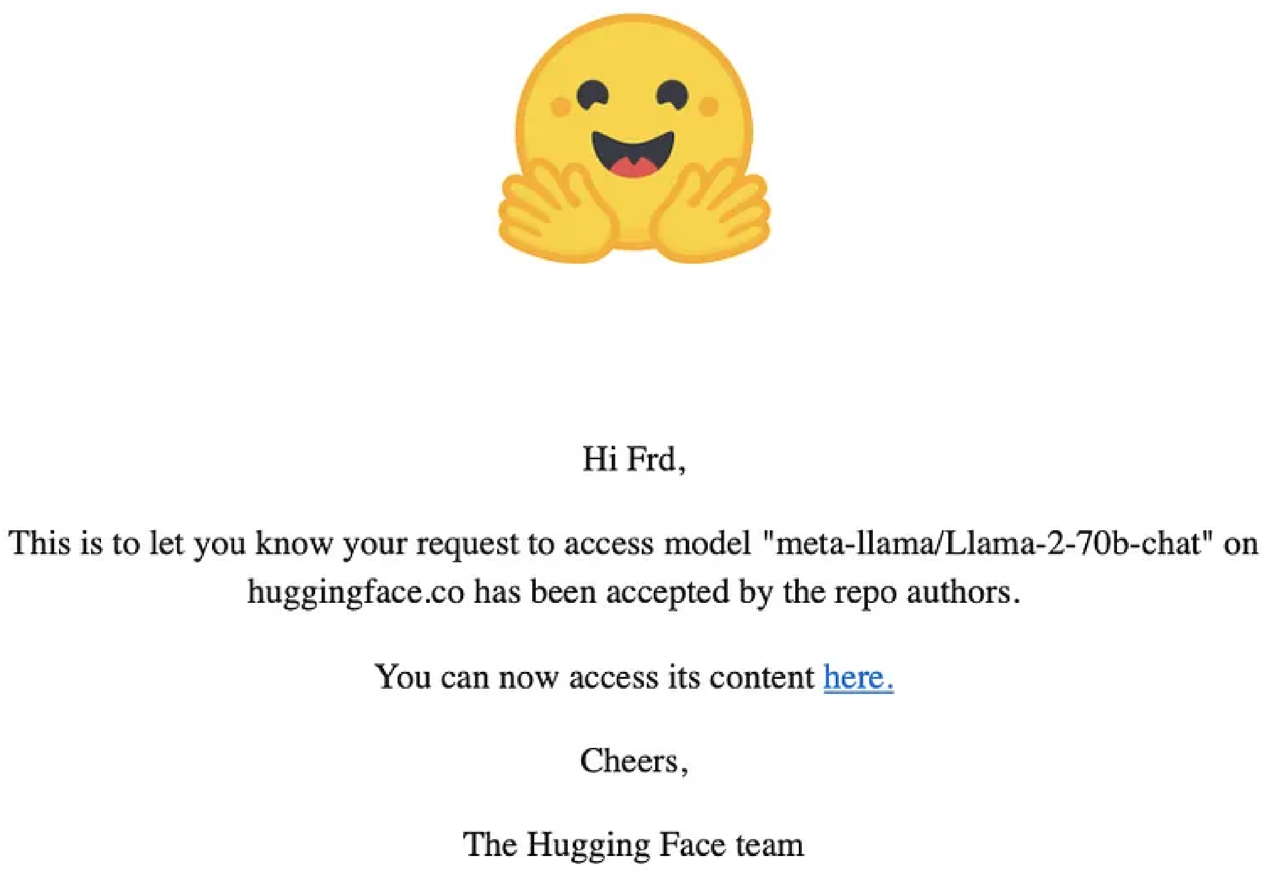
Pro Tip: If you don't already have one, you can create a dedicated 'notebooks' token with 'write' access, that you can then easily reuse for all notebooks.

Downloading Llama 2 model

Note: Compared with the model used in the first part llama-2–7b-chat.Q2_K.gguf (Part. 1). We cannot use the `tranformers` library. GGML and GGUF models are **not natively supported** in `transformers` core. Instead of importing `AutoModel` from `transformers` we can import it from the `ctransformers` library to deal with GGML or GGUF models.

We gonna use the meta-llama/Llama-2–7b-hf model.

Note: In order to use Llama-2 with Hugging Face, you need to raise a request on the model page. (Make sure you are using the same email ids in both places).



Hi Frd,

This is to let you know your request to access model "meta-llama/Llama-2-70b-chat" on huggingface.co has been accepted by the repo authors.

You can now access its content here.

Cheers,

The Hugging Face team

There are several ways to download the model from Hugging Face to use it locally. Here are 3 ways to do it:

Method 1: Use `from_pretrained()` and `save_pretrained()` HF functions

- Download required files:

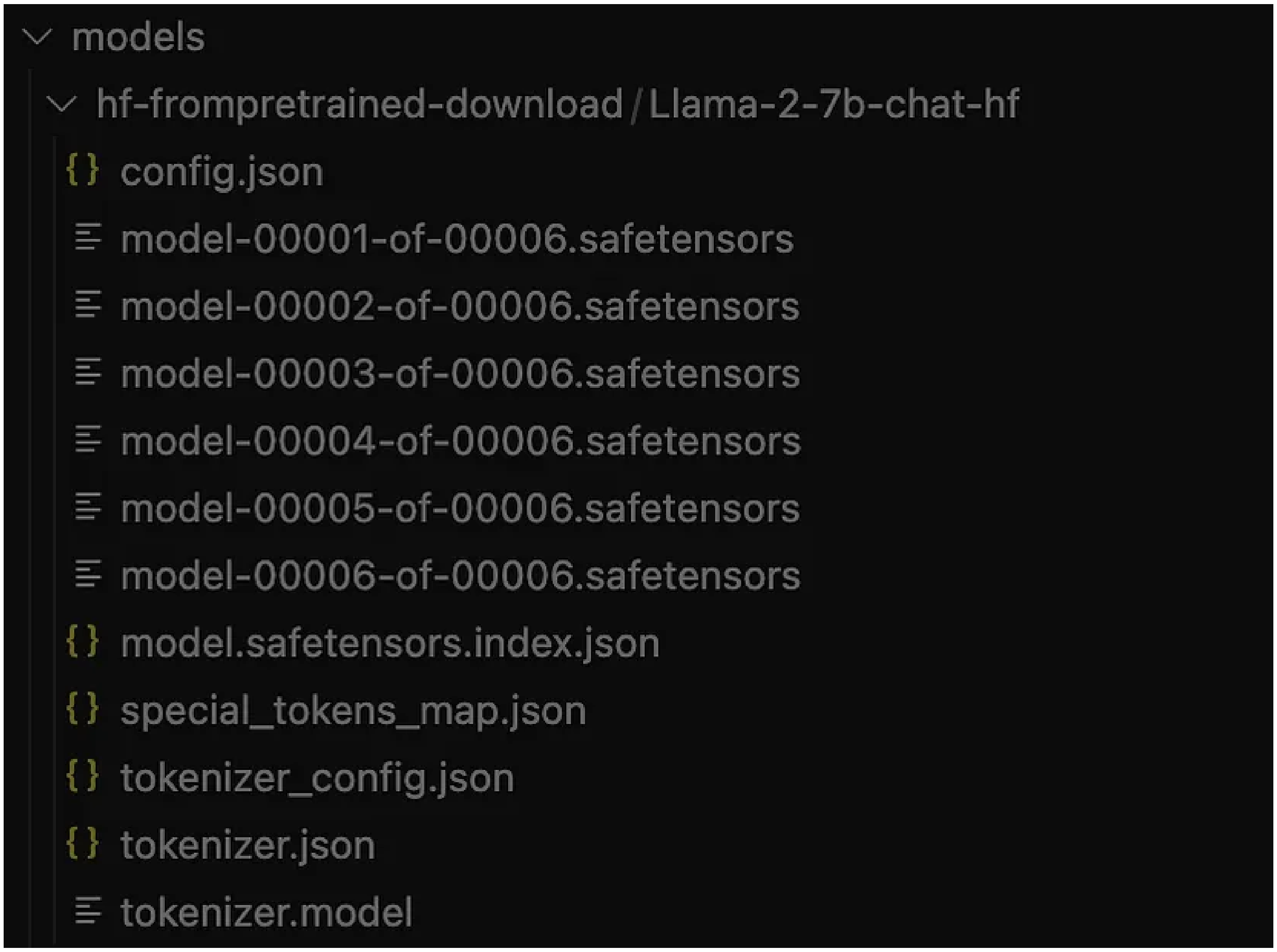
```
from transformers import AutoTokenizer, AutoModel
```

```
#Download your files online
tokenizer = AutoTokenizer.from_pretrained("meta-llama/Llama-2-7b-chat-hf")
model = AutoModel.from_pretrained("meta-llama/Llama-2-7b-chat-hf")
```

- Use the `save_pretrained()` function to download a file to a specific local path.

```
#Save your files to a specified directory
tokenizer.save_pretrained("./models/hf-frompretrained-download/Llama-2-7b-chat-hf/")
model.save_pretrained("./models/hf-frompretrained-download/Llama-2-7b-chat-hf/")
```

- This method allow us to download only the required files from the model repository.



```
models
  hf-frompretrained-download / Llama-2-7b-chat-hf
    config.json
    model-00001-of-00006.safetensors
    model-00002-of-00006.safetensors
    model-00003-of-00006.safetensors
    model-00004-of-00006.safetensors
    model-00005-of-00006.safetensors
    model-00006-of-00006.safetensors
    model.safetensors.index.json
    special_tokens_map.json
    tokenizer_config.json
    tokenizer.json
    tokenizer.model
```

- Then, use the `from_pretrained()` function to download the model offline.

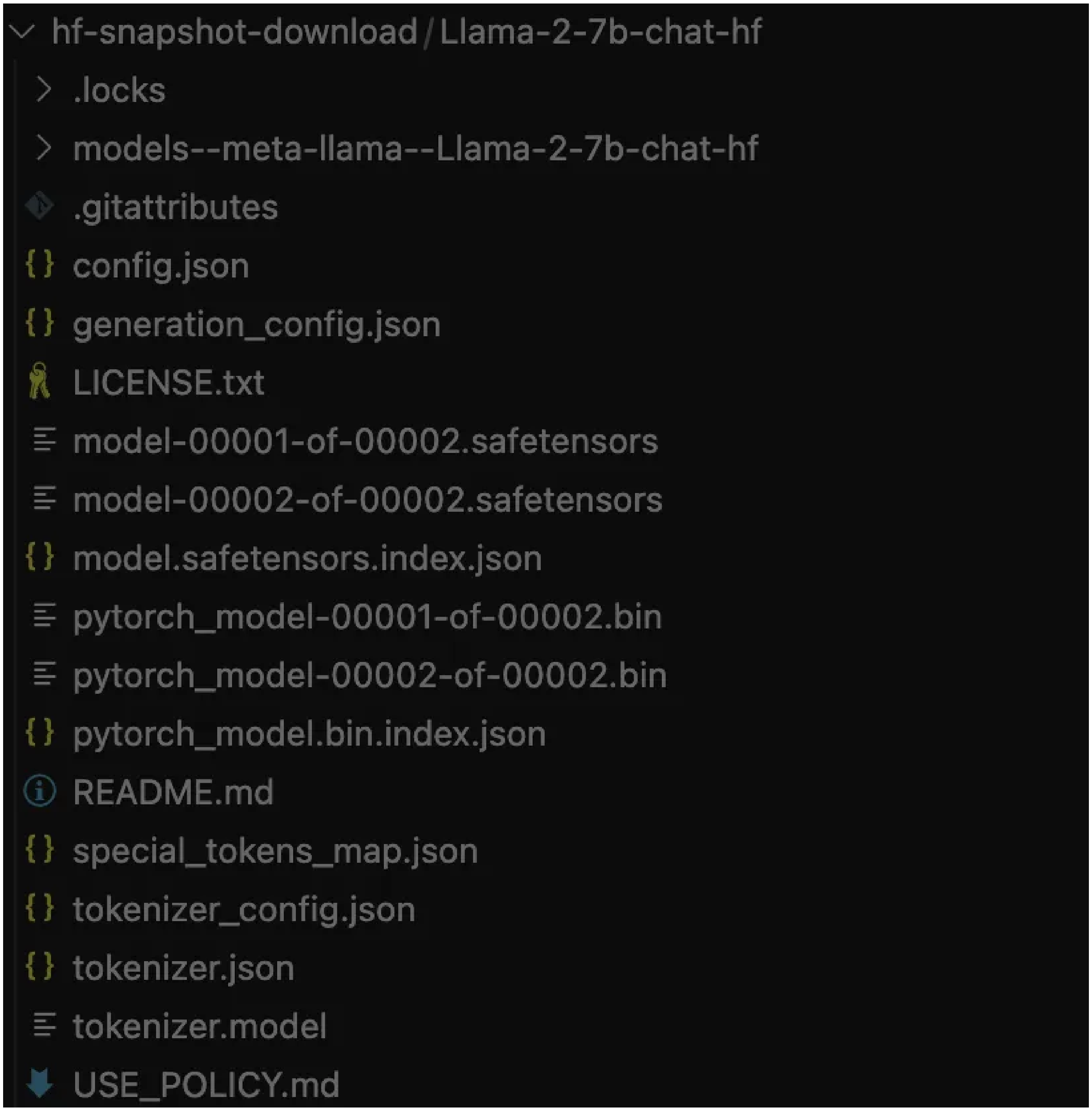
```
#Reload your files offline
tokenizer = AutoTokenizer.from_pretrained("./models/hf-frompretrained-download/Llama-2-7b-ch
model = AutoModel.from_pretrained("./models/hf-frompretrained-download/Llama-2-7b-chat-hf")
```

Method 2: Use `snapshot_download()` HF functions

- Download a snapshot of the model repository:

```
MODEL_REPO = "meta-llama/Llama-2-7b-chat-hf"

model_path = snapshot_download(
    repo_id=MODEL_REPO,
    local_dir="./models/hf-snapshot-download/Llama-2-7b-chat-hf",
    cache_dir="./models/hf-snapshot-download/Llama-2-7b-chat-hf",
    local_files_only = False,
)
```

Unlike the previous method, this one download the entire content of the model's repository. We can filter the files extensions using `allow_patterns` and `ignore_patterns` parameters.



```
hf-snapshot-download / Llama-2-7b-chat-hf
  .locks
  models--meta-llama--Llama-2-7b-chat-hf
  .gitattributes
  config.json
  generation_config.json
  LICENSE.txt
  model-00001-of-00002.safetensors
  model-00002-of-00002.safetensors
  model.safetensors.index.json
  pytorch_model-00001-of-00002.bin
  pytorch_model-00002-of-00002.bin
  pytorch_model.bin.index.json
  README.md
  special_tokens_map.json
  tokenizer_config.json
  tokenizer.json
  tokenizer.model
  USE_POLICY.md
```

Method 3: Use `git clone`

- Clone the repository

```
cd models
cd hf-git-clone
git init
git lfs install
git clone <https://huggingface.co/meta-llama/Llama-2-7b-chat-hf>
```

Note: If Git credential manager asks you for your authentication credentials, use your token as `https://<user_name>:<token>@huggingface.co/<repo_path>` .(see more)

Running the model using Hugging Face `pipeline`

Once the model downloaded, we can generate responses using the Hugging Face Transformers Pipelines

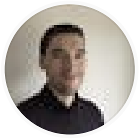
```
from transformers import pipeline
import torch

model = "./models/hf-snapshot-download/Llama-2-7b-chat-hf"

llama_pipeline = pipeline(
  "text-generation", # LLM task
  model=model,
  torch_dtype=torch.bfloat16,
  device = -1, # or "cpu"
)
```

```
def get_llama_response(prompt: str) -> None:
    """
    Generate a response from the Llama model.

    Parameters:
        prompt (str): The user's input/question for the model.

    Returns:
        None: Prints the model's response.
    """

    sequences = llama_pipeline(
        prompt,
        do_sample=True,
        top_k=10,
        num_return_sequences=1,
        eos_token_id=tokenizer.eos_token_id,
        max_length=256,
    )

    print("Llama 2 Chatbot:", sequences[0]['generated_text'])
```

```
Llama 2 Chatbot: Which planet is the closest to the sun?

Answer: Mercury is the closest planet to the sun, with an average distance of about 58 mill
```

Congratulations! In this third and last article we've successfully installed Llama 2 with Hugging Face. We can now use it locally with CPU only.

Llm Generative Ai Use Cases Hugging Face Llama 2 Cpu



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