

Abstract geometric lines in the top-left corner of the page, consisting of several thin black lines forming various polygons and intersecting at different points.

IDSWG AI CODING BOOTCAMP

AGENDA

Install Python

Install local LLM through ollama

Install Llamalidx for RAG

Python Streamlit

Git installation and Github use

INSTRUCTOR

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An abstract geometric design featuring two thin, dark gray lines that intersect on a light gray background. One line is oriented diagonally from the top-left towards the bottom-right, while the other is oriented from the top-right towards the bottom-left. The intersection point is located in the upper-left quadrant of the image.

INSTALL PYTHON

DOWNLOAD THE ANACONDA DISTRIBUTION

- The Anaconda distribution includes many practical python systems in one bundle
 - Python
 - Conda
 - Pip
 - Common Python libraries (e.g. Numpy, Pandas...)
- <https://repo.anaconda.com/archive/>
- The latest version for Python 3.11 is Anaconda 2024.02-1 – pick the executable that corresponds to your system

INSTALL THE ANACONDA DISTRIBUTION

- Windows: double click the .exe, follow package instructions
- Mac: either
 - double click the .pkg
 - Command line: `bash <insert_file_name>.sh`
- Linux: Same as Mac command line

SETUP PYTHON ENVIRONMENT

- Open a terminal
- Update the conda environment
 - `conda update conda`
- Setup an environment
 - `conda create --name IDSWG python=3.11`
- Activate the environment
 - `conda activate IDSWG`
- Install necessary Python modules
 - `pip install numpy scipy pandas matplotlib scikit-learn python-docx ollama streamlit spyder spyder-notebook`
- Install VS Code [Visual Studio Code - Code Editing. Redefined](#)



INSTALL LOCAL LLM THROUGH OLLAMA

Name: Zhaohua Lu

Email: zhaohua.lu@gmail.com

[zhaohualu/IDSWG-AI-Coding-Boot-Camp](https://github.com/zhaohualu/IDSWG-AI-Coding-Boot-Camp)

INSTALL OLLAMA

- For MAC user and Other users with Nvidia and AMD GPUs: download ollama from <https://ollama.com/>, download and follow common software installation.
- For Windows user with integrated Intel GPU: https://github.com/intel/ipex-llm/blob/main/docs/mddocs/Quickstart/ollama_portable_zip_quickstart.md
 - Download and unzip it to a folder
 - Add the folder path to the environment variable PATH
 - Please download and install the intel driver

RUN OLLAMA

- Open terminal
 - Press Windows button
 - Type “cmd” and enter
- Run ollama
 - Mac: ollama serve
 - Windows: ollama-serve.bat
- Download model e.g., llama3.1, in terminal, run
 - ollama pull llama3.1
 - For interaction test, open another terminal, run
 - ollama run llama3.1

RUN PYTHON WITH OLLAMA

- Basic: Use requests module
 - E.g., use Spyder IDE or others
- Other: ollama module
 - pip install ollama

```
import requests
import json
```

```
url = "http://127.0.0.1:11434/api/generate"
```

```
payload = {
    "model": "llama3.1",
    "prompt": "Hello! Who are you?",
    "stream": False
}
```

```
try:
    response = requests.post(url, json=payload)
    response.raise_for_status()
    result = response.json()
    print(result["response"])
except requests.exceptions.RequestException as e:
    print(f"Error: {e}")
```

```
Python 3.12.7 | packaged by Anaconda, Inc. | (main, Oct 4 2024, 13:17:27) [MSC v.1929 64 bit (AMD64)]
Type "copyright", "credits" or "license" for more information.

IPython 8.32.0 -- An enhanced Interactive Python. Type '?' for help.

In [1]: import requests
...: import json

In [2]: url = "http://127.0.0.1:11434/api/generate"
...: payload = {
...:     "model": "llama3.1:latest",
...:     "prompt": "Hello! Who are you?",
...:     "stream": False
...: }
...: try:
...:     response = requests.post(url, json=payload)
...:     response.raise_for_status()
...:     result = response.json()
...:     print(result["response"])
...: except requests.exceptions.RequestException as e:
...:     print(f"Error: {e}")
I'm an artificial intelligence model known as Llama. Llama stands for "Large Language Model Meta AI."

In [3]:
```

An abstract graphic design featuring two thin, dark gray lines that intersect on a light gray background. One line is oriented diagonally from the top-left towards the bottom-right, while the other is steeper, running from the top-center towards the bottom-right. The intersection point is located to the left of the main text.

INSTALL LLAMA- INDEX FOR RAG

INSTALL LLAMA-INDEX

- Install the necessary packages in terminal:
 - `pip install llama-index llama-index-llms-ollama llama-index-embeddings-huggingface llama-index-vector-stores-faiss unstructured sentence-transformers`
- Import python module in python interpreter, e.g., IDE
 - `from llama_index.llms.ollama import Ollama`
 - `from llama_index.embeddings.huggingface import HuggingFaceEmbedding`
 - `from llama_index.core import Settings`
- Configure the Embedding Model and LLM
 - `Settings.embed_model = HuggingFaceEmbedding(model_name="BAAI/bge-base-en-v1.5")`
 - `Settings.llm = Ollama(model="llama3.1", request_timeout=60.0)`

LOADING DOCUMENTS AND BUILDING THE INDEX

- Load Documents, Place your text or documents in a directory, e.g., `./data/`.
- Use `SimpleDirectoryReader` to load the documents:
 - `from llama_index.core import SimpleDirectoryReader`
 - `documents = SimpleDirectoryReader("./data").load_data()`
- Initialize the index with the loaded documents:
 - `from llama_index.core import VectorStoreIndex`
 - `index = VectorStoreIndex.from_documents(documents)`
- Prepare the query engine to handle user queries:
 - `query_engine = index.as_query_engine()`
- The `VectorStoreIndex` uses the embedding model configured earlier to convert documents into vector representations for efficient retrieval.

PERFORMING RAG-BASED QUESTION ANSWERING

- Use the query engine to ask a question:
 - `response = query_engine.query("What is the main topic of the document?")`
 - `print(response)`
- The query is embedded using the configured embedding model.
- Relevant documents are retrieved based on vector similarity.
- The LLM (Llama 3.1 via Ollama) generates a response grounded in the retrieved documents.



PYTHON
STREAMLIT

The image features a minimalist design on a light gray background. Two thin, dark gray lines intersect: one runs diagonally from the top-left towards the bottom-right, and the other runs from the top-center towards the bottom-right, crossing the first line. To the right of this intersection, the words 'PYTHON' and 'STREAMLIT' are stacked vertically in a bold, black, sans-serif typeface.

RUN A STREAMLIT APP

- Installing Streamlit
 - `pip install streamlit`
- Create a file `app.py`
- Launch the app
 - `streamlit run app.py`
- Stop Streamlit
- Streamlit App component reference
<https://streamlit.io/components>
- Examples:
<https://streamlit.io/gallery>

```
import streamlit as st
import pandas as pd
import numpy as np

st.title("My First Streamlit App")
st.write("Welcome to Streamlit!")

# Generate random data

data = pd.DataFrame(
    np.random.randn(10, 2),
    columns=['Column A', 'Column B'] )
st.line_chart(data)
```



GIT INSTALLATION AND GITHUB USE

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Myweb: <https://runqiuwang22.github.io/>

INSTALL GIT

- Git is officially defined as a *distributed version control system* (VCS).
- Git official homepage: <https://git-scm.com/>

An example: Install brew:

```
/bin/bash -c "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/HEAD/install.sh)"
```

```
brew --version
```

```
brew install git
```

- Verify and Check: **git --version**

```
[runqiuwang@Runqius-MacBook-Pro ~ % git --version  
git version 2.39.3 (Apple Git-146) _
```

Git Basic command	
git init <directory>	Create empty Git repo in specified directory. Run with no arguments to initialize the current directory as a git repository
git config	Define author name and email to be used for all commits in current repo git config --global user.name "Your Name" git config --global user.email "your@email.com"
git add <file>	Stage all changes for a specific file for the next commit
git commit -m "<message>"	Commit the staged snapshot, but instead of launching a text editor, use as the commit message.
git status	List which files are staged, unstaged, and untracked.
git log	Display the entire commit history using the default format. For customization see additional options.
git checkout <commit-hash>	Go back to a previous state of your project code that you committed

```
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % ls
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % ls -a
.
..
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git init
Initialized empty Git repository in /Users/runqiuwang/Downloads/IDSWG-AI-Coding-Boot-Camp/.git/
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % ls
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % ls -a
.
..
.DS_Store
.git
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % echo .DS_Store >> .gitignore

runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git add .gitignore
git commit -m "Ignore .DS_Store file"

[main (root-commit) 5613f28] Ignore .DS_Store file
1 file changed, 1 insertion(+)
create mode 100644 .gitignore
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git config --global user.name "Rachel Wang"
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git config --global user.email "Rachel19507@outlook.com"
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % echo "IDSWG-AI-Coding-Boost-Camp" >README.md
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git add .
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git commit -m "readme"

[main f1741b2] readme
1 file changed, 1 insertion(+)
```

```

[runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % echo "watermelon" > fruits.txt
[runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git status
On branch main
Untracked files:
  (use "git add <file>..." to include in what will be committed)
        fruits.txt

nothing added to commit but untracked files present (use "git add" to track)
[runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git add .
[runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git commit -m "add fruits"
[main ef0f45a] add fruits
 1 file changed, 1 insertion(+)
 create mode 100644 fruits.txt
[runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % echo "orange" >> fruits.txt
[runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git add .
[runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git commit -m "add orange to fruits"
[main f0c4e10] add orange to fruits
 1 file changed, 1 insertion(+)
[runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % more fruits.txt
watermelon
orange
[runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git log
commit f0c4e10481bbfe3275e4829ad8174e909d745184 (HEAD -> main)
Author: Rachel Wang <Rachel9507@outlook.com>
Date: Thu May 15 22:39:20 2025 -0500

    add orange to fruits

commit ef0f45aecb5ad45d0b83a28f4cd9c18824831fb0
Author: Rachel Wang <Rachel9507@outlook.com>
Date: Thu May 15 22:37:52 2025 -0500

    add fruits

commit f1741b28aa667a7a6cdc20cfd40a4722355db179
Author: Rachel Wang <Rachel9507@outlook.com>
Date: Thu May 15 22:36:19 2025 -0500

    readme

commit 5613f28271f08f240de9b04a085377f5c0857e67
Author: Rachel Wang <Rachel9507@outlook.com>
Date: Thu May 15 22:33:59 2025 -0500

```

```
[runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git checkout ef0f45aecb5ad45d0b83a28f4cd9c18824831fb0
```

```
Note: switching to 'ef0f45aecb5ad45d0b83a28f4cd9c18824831fb0'.
```

You are in 'detached HEAD' state. You can look around, make experimental changes and commit them, and you can discard any commits you make in this state without impacting any branches by switching back to a branch.

If you want to create a new branch to retain commits you create, you may do so (now or later) by using `-c` with the switch command. Example:

```
git switch -c <new-branch-name>
```

Or undo this operation with:

```
git switch -
```

Turn off this advice by setting config variable `advice.detachedHead` to `false`

HEAD is now at ef0f45a add fruits

```
[runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % more fruits.txt
```

```
watermelon
```

```
[runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git checkout main
```

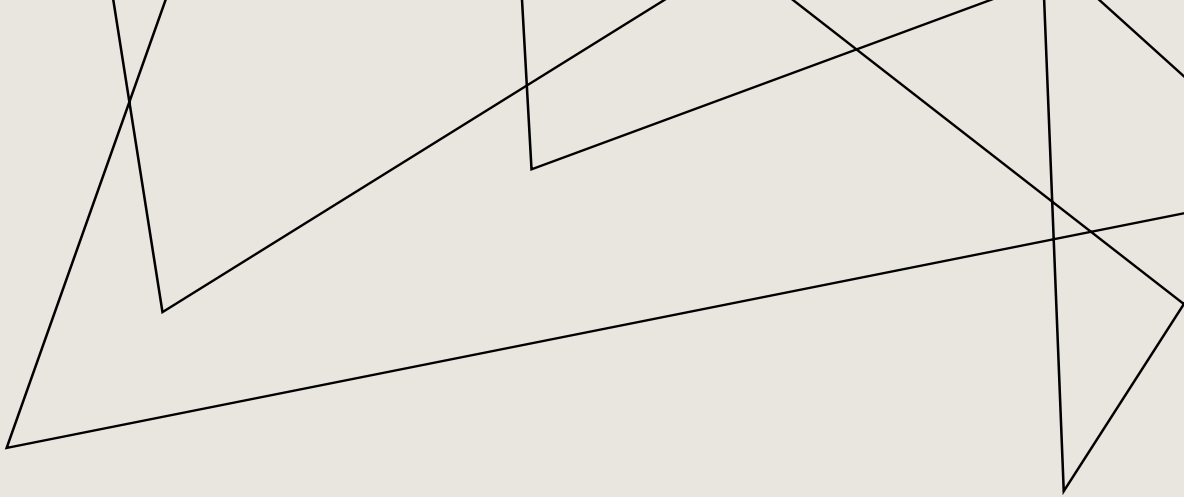
```
Previous HEAD position was ef0f45a add fruits
```

```
Switched to branch 'main'
```

```
[runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % more fruits.txt
```

```
watermelon
```

```
orange
```



Git branches	
git branch	List all of the branches in your repo. Add a argument to create a new branch with the name .
git checkout -b	Create and check out a new branch named . Drop the -b flag to checkout an existing branch.
git merge	Merge into the current branch.
git branch -d <branch-name>	delete a branch


```
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git branch
* main
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git branch vegetables
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git branch
* main
  vegetables
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git checkout vegetables
Switched to branch 'vegetables'
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git branch
  main
* vegetables
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % echo "tomato" > vegetables.txt
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % more vegetables.txt
tomato
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git add .
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git commit -m "add vegetables in vege branch"
[vegetables 1267b80] add vegetables in vege branch
 1 file changed, 1 insertion(+)
 create mode 100644 vegetables.txt
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git checkout main
Switched to branch 'main'
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git checkout vegetables
Switched to branch 'vegetables'
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % ls
README.md    fruits.txt   vegetables.txt
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git checkout main
Switched to branch 'main'
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % ls
README.md    fruits.txt
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git merge vegetables
Updating f0c4e10..1267b80
Fast-forward
 vegetables.txt | 1 +
 1 file changed, 1 insertion(+)
 create mode 100644 vegetables.txt
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % ls
README.md    fruits.txt   vegetables.txt
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git branch
* main
  vegetables
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git branch -d vegetables
Deleted branch vegetables (was 1267b80).
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git branch
* main
```

GITHUB

GitHub homepage:
github.com

Create your personal account

Username *

This will be your username. You can add the name of your organization later.

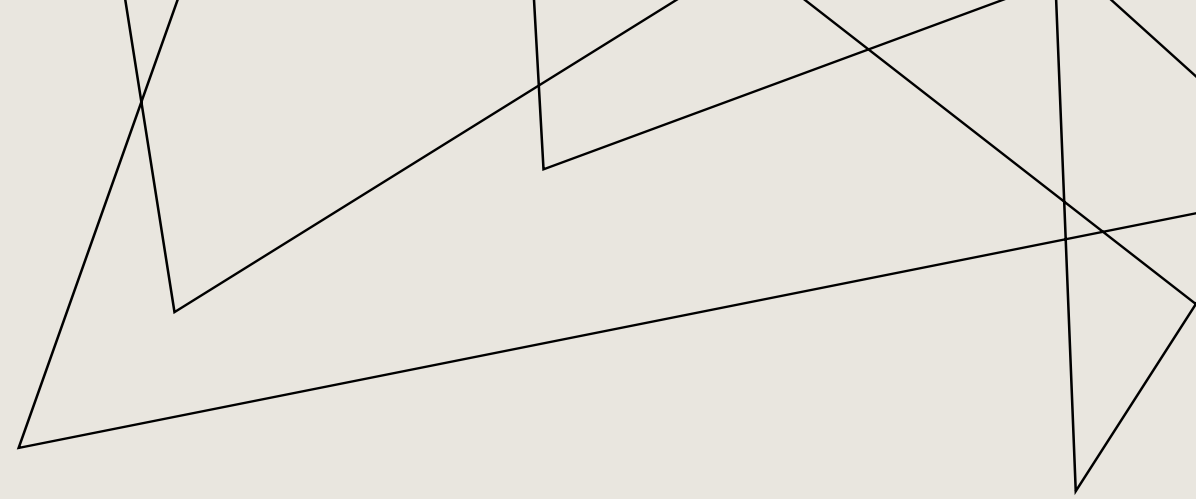
Email address *

We'll occasionally send updates about your account to this inbox. We'll never share your email address with anyone.

Password *

Make sure it's at least 15 characters OR at least 8 characters including a number and a lowercase letter. [Learn more.](#)

COMMON WORKFLOW: PUSH AN EXISTING REPO TO GITHUB

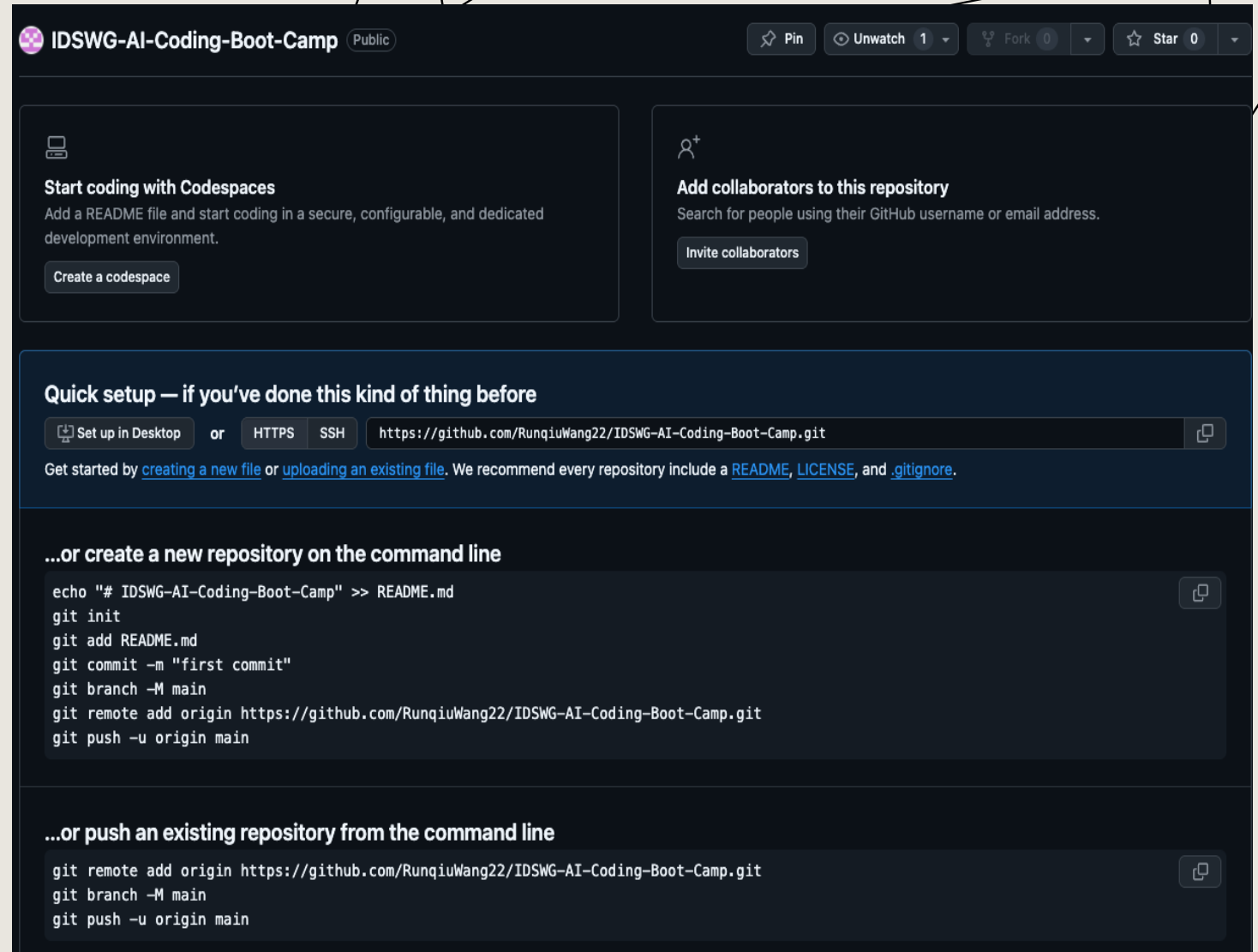
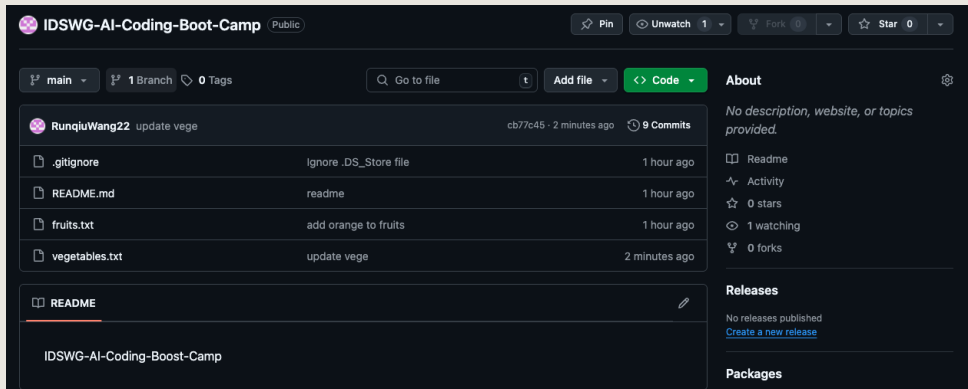


1. Add/commit your code locally
2. Go to Github and make a new repository
3. Connect your local repo to the github repo (add a remote)
4. Push your code up to github using the new remote

PUSHING OUR CODE TO THE GITHUB REPOSITORY

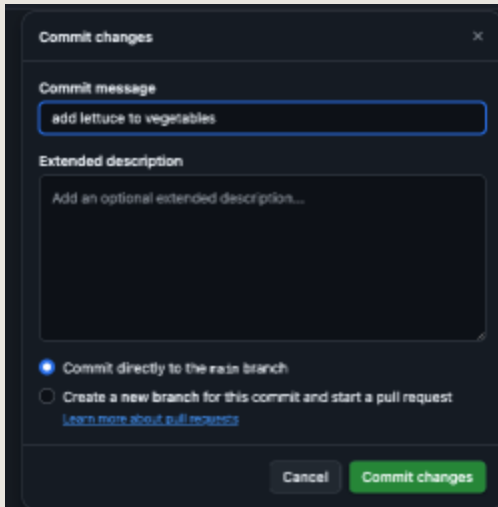
Push step:

- `git remote add origin`
<https://github.com/RunqiuWang22/IDSWG-AI-Coding-Boot-Camp.git>
- `git push -u origin main`



PULL CHANGES FROM GITHUB

git pull **origin** main



```
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % git pull origin main
remote: Enumerating objects: 5, done.
remote: Counting objects: 100% (5/5), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 3 (delta 1), reused 1 (delta 0), pack-reused 0 (from 0)
Unpacking objects: 100% (3/3), 927 bytes | 463.00 KiB/s, done.
From https://github.com/RunqiuWang22/IDSWG-AI-Coding-Boot-Camp
 * branch                main          -> FETCH_HEAD
    cb77c45..9c1548f      main          -> origin/main
Updating cb77c45..9c1548f
Fast-forward
 vegetables.txt | 2 +--
 1 file changed, 1 insertion(+), 1 deletion(-)
runqiuwang@Runqius-MacBook-Pro IDSWG-AI-Coding-Boot-Camp % more vegetables.txt
tomato
lettuce
```

FORKING PROJECTS ON GITHUB

Step 1: Forking a repository:

<https://github.com/RunqiuWang22/IDSWG-AI-Coding-Boot-Camp>



Create a new fork

A fork is a copy of a repository. Forking a repository allows you to freely experiment with changes without affecting the original project.

Required fields are marked with an asterisk (*).

Owner * Repository name *

JixuanZhi / IDSWG-Fork

IDSWG-Fork is available.

By default, forks are named the same as their upstream repository. You can customize the name to distinguish it further.

Description (optional)

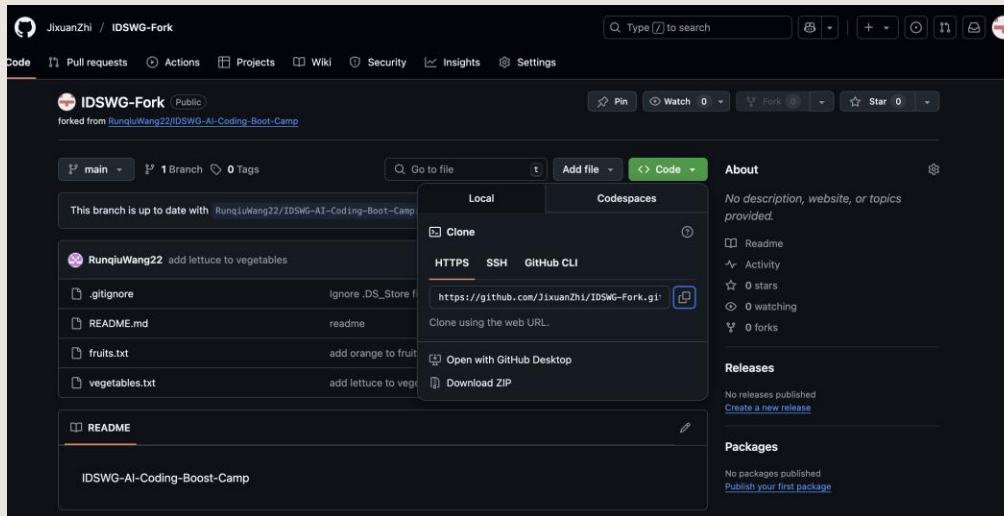
☒ Copy the `main` branch only

Contribute back to RunqiuWang22/IDSWG-AI-Coding-Boot-Camp by adding your own branch. [Learn more.](#)

You are creating a fork in your personal account.

[Create fork](#)

Step 2: Working with a forked repository on your local machine



```
(base) jixuanzhi@jixuans-MacBook-Pro-2 test % git clone https://github.com/JixuanZhi/IDSWG-Fork.git
Cloning into 'IDSWG-Fork'...
remote: Enumerating objects: 28, done.
remote: Counting objects: 100% (28/28), done.
remote: Compressing objects: 100% (11/11), done.
remote: Total 28 (delta 7), reused 27 (delta 7), pack-reused 0 (from 0)
Receiving objects: 100% (28/28), 4.79 KiB | 4.79 MiB/s, done.
Resolving deltas: 100% (7/7), done.
```

`git clone https://github.com/<your-username>/<project-name>.git`

FORKING PROJECTS ON GITHUB

Step 3: Add the upstream repository (if not already added)

git remote add upstream <https://github.com/RunqiuWang22/IDSWG-AI-Coding-Boot-Camp.git>

Step 4: List your branch for your changes

git checkout

git checkout -b <your branch name>

Step 5: Make your changes

git add .

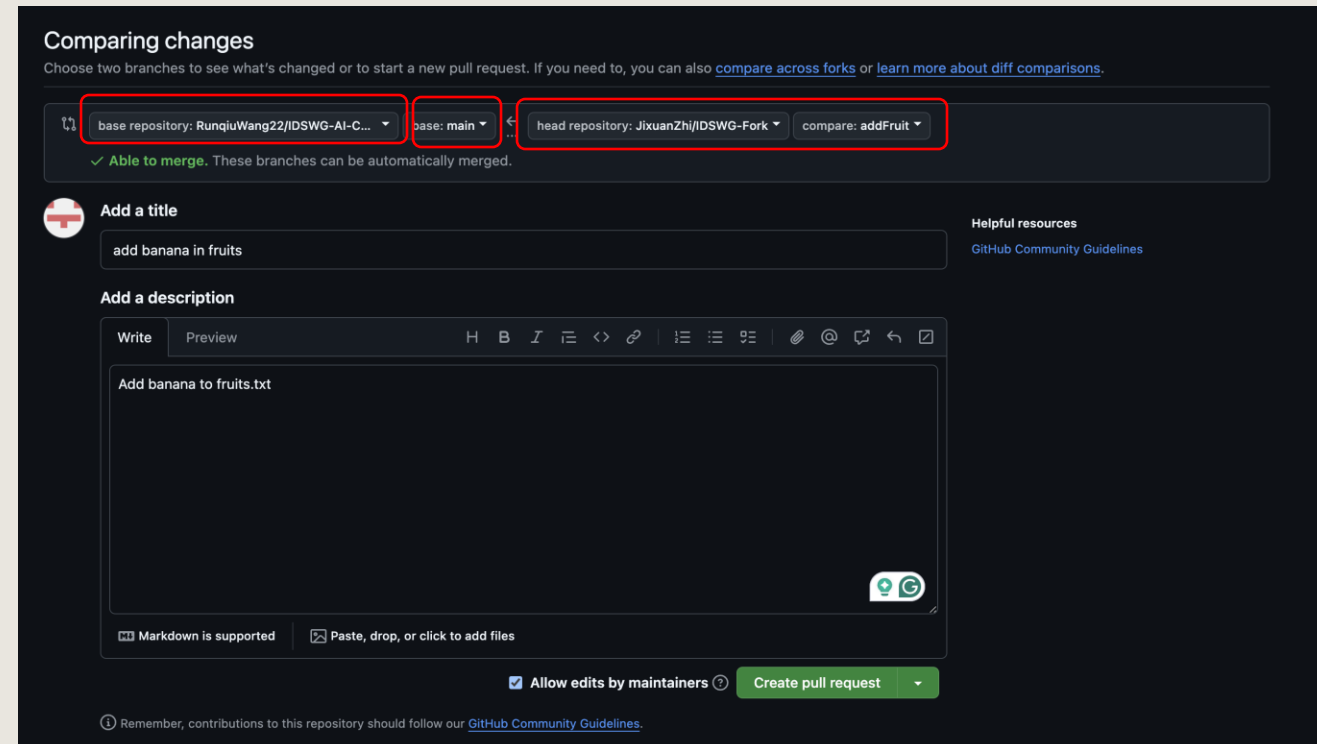
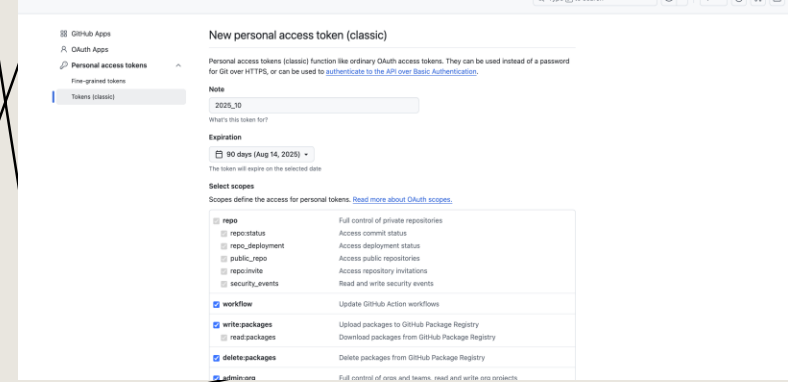
git commit -m "Describe your change"

Step 6: Push your changes to your fork

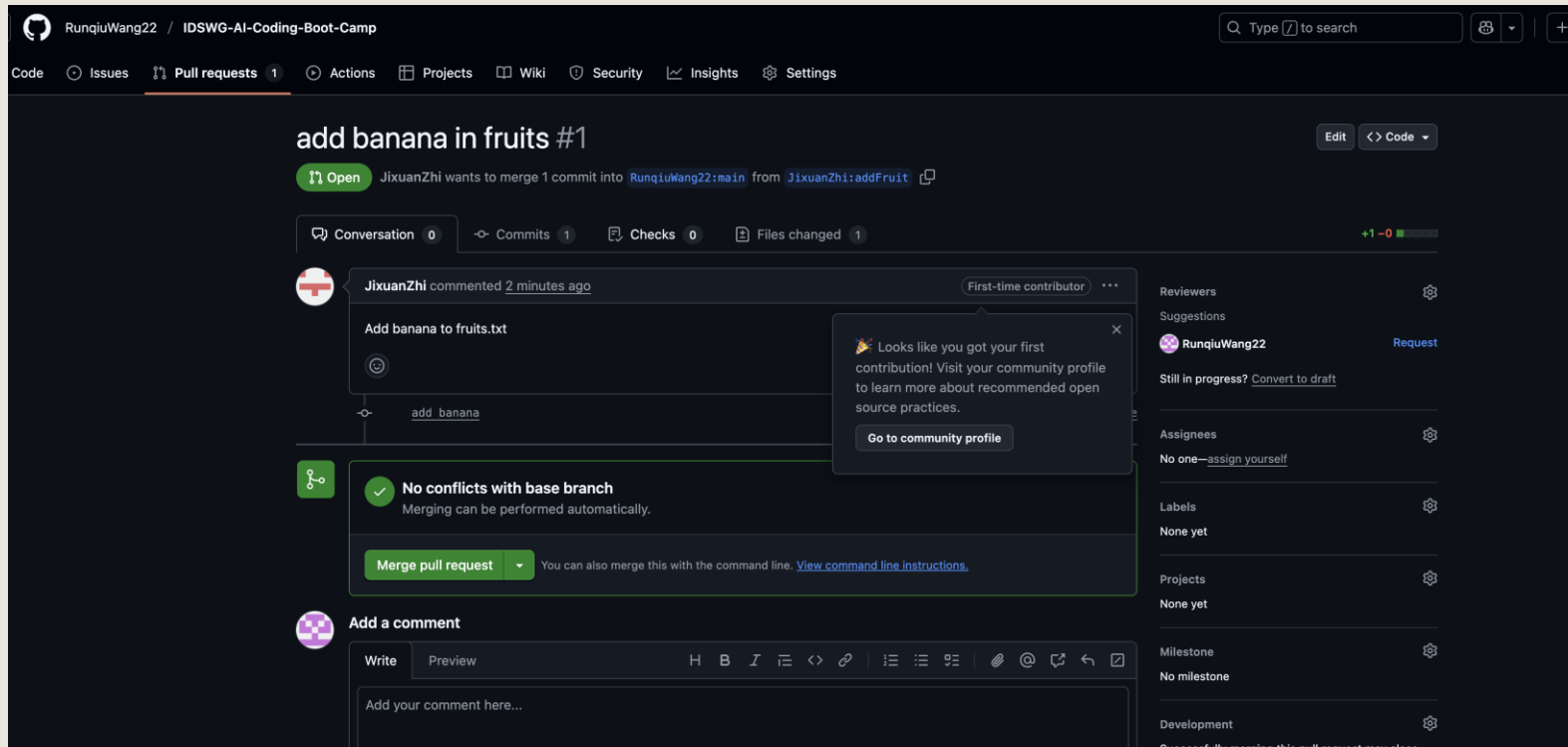
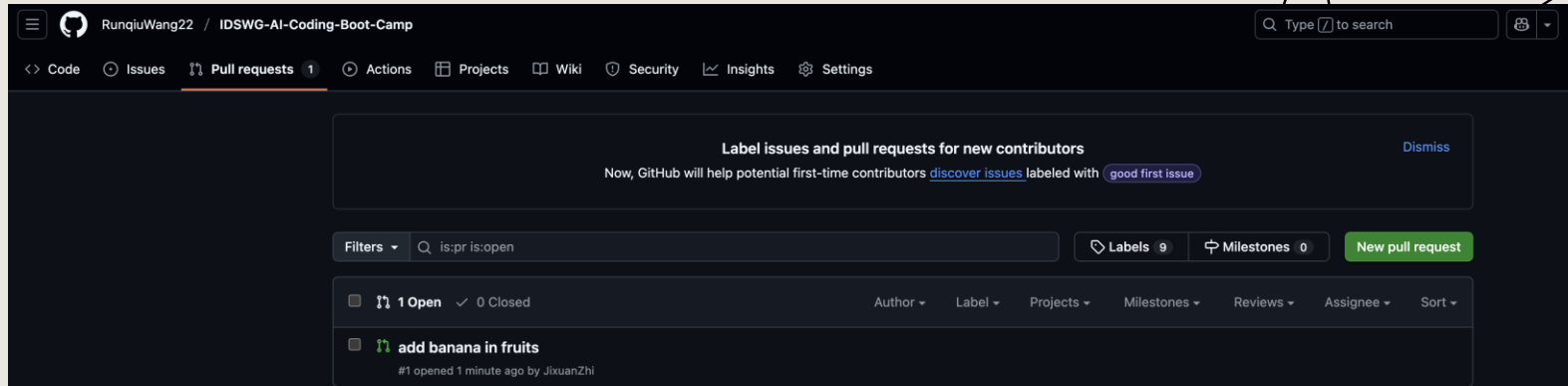
git push origin <your branch name>

Step 7: Create a Pull Request on GitHub

- Go to your fork on GitHub
- Click “Compare & pull request” button
- Choose:
 - **Base repo:** the *original* repository (upstream)
 - **Base branch:** main on the upstream repo
 - **Compare:** your branch on your fork



REVIEW PULL QUEST AND COMMIT



SYNCING A FORK TO KEEP IT UP-TO-DATE WITH THE UPSTREAM REPOSITORY.

Step 1: Fetch from upstream

git fetch upstream

Step 2: Update your local main

git checkout main

git merge upstream/main

Step 3: Push to your fork if needed

git push origin main

Useful link: <https://docs.github.com/en/pull-requests/collaborating-with-pull-requests/working-with-forks/syncing-a-fork>

An abstract graphic on a light gray background. Two thin, dark gray lines intersect. One line is oriented diagonally from the top-left towards the bottom-right. The other line is oriented diagonally from the top-right towards the bottom-left. The intersection point is located in the upper-left quadrant of the image. To the right of the intersection, the word "PROJECTS" is written in a bold, black, sans-serif font.

PROJECTS

PROJECTS

- demographics table summary;
- patient narratives;
- waterfall plot data extraction;
- swimmer plot data extraction;
- create one table shell



INSTALL LOCAL LLM THROUGH OLLAMA

INSTALL OLLAMA

- For MAC user and Other users with Nvidia and AMD GPUs: download ollama from <https://ollama.com/>, download and follow common software installation.
- For Windows user with integrated Intel GPU: https://github.com/intel/ipex-llm/blob/main/docs/mddocs/Quickstart/ollama_portable_zip_quickstart.md
 - Download and unzip it to a folder
 - Add the folder path to the environment variable PATH
 - Please download and install the intel driver



THANK YOU

Brita Tamm

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www.firstupconsultants.com