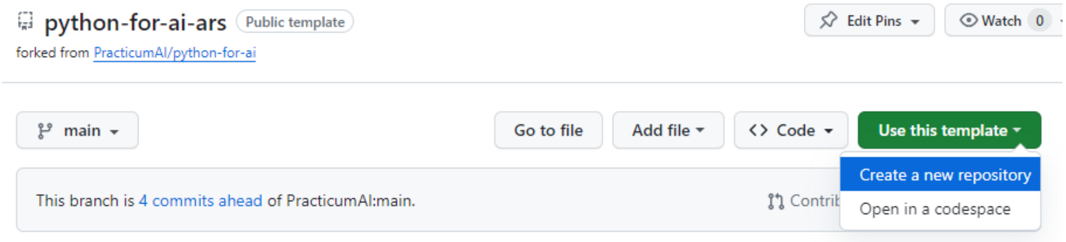
Python for AI - Jupyter Notebooks: Using Atlas

Step 1: Create your repository from the template

Most *Practicum AI* exercises will start with you using one of our template repositories to create your own repository. This allows you to get the latest version of our exercises and put a copy in your own space where you can work on the exercises using git and GitHub.

> **Note**: You will need a GitHub account for this. You can create your account at https://github.com/. Click the **Sign up** button.
>
> **Please note that for official USDA work, you may *not* use a free GitHub account. Instead, you must use USDA's GitHub Enterprise Cloud platform. Your unit can purchase GitHub Enterprise Cloud licenses through the SLIM system, which is also used for purchasing other centrally managed software. If you are only using GitHub for the Practicum AI course, you may use a free account.**

- The template for this module is at: https://github.com/PracticumAI/python-for-ai-ars
- From that site, click the green **Use this template** button and select **Create a new repository**. (Remember, you need to be signed in to GitHub for the Use this template button to show up)

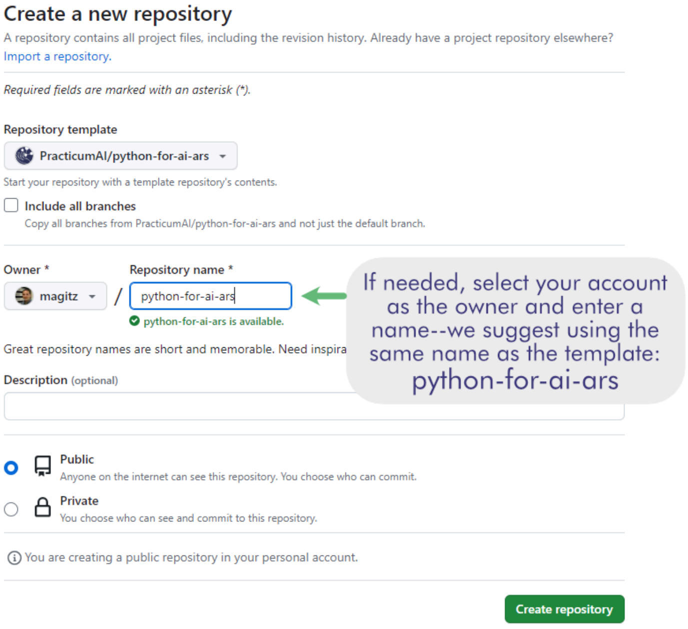


python-for-ai-ars Public template

forked from PracticumAI/python-for-ai

This branch is 4 commits ahead of PracticumAI:main.

- On the new window, you may need to select the owner. **Select your GitHub account**. Then, type a name for the new repository. In this case, we suggest using the same name as the template: **python-for-ai-ars**.
- Click the **Create repository from template** button.
- This will now create your own copy of the repository. This is your own playground for you to work in. GitHub will show where you generated the repository from, so you can always get back to the source, but this is yours to use.
- Now you are ready to set up a Jupyter session in step 2.



Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? Import a repository.

Required fields are marked with an asterisk (*).

Repository template: PracticumAI/python-for-ai-ars

Start your repository with a template repository's contents.

□ Include all branches
Copy all branches from PracticumAI/python-for-ai-ars and not just the default branch.

Owner *: magitz / Repository name *: python-for-ai-ars

python-for-ai-ars is available.

Great repository names are short and memorable. Need inspira

Description (optional)

● Public
Anyone on the internet can see this repository. You choose who can commit.

○ Private
You choose who can see and commit to this repository.

You are creating a public repository in your personal account.

If needed, select your account as the owner and enter a name--we suggest using the same name as the template: python-for-ai-ars

Step 2: Launch Jupyter on Atlas

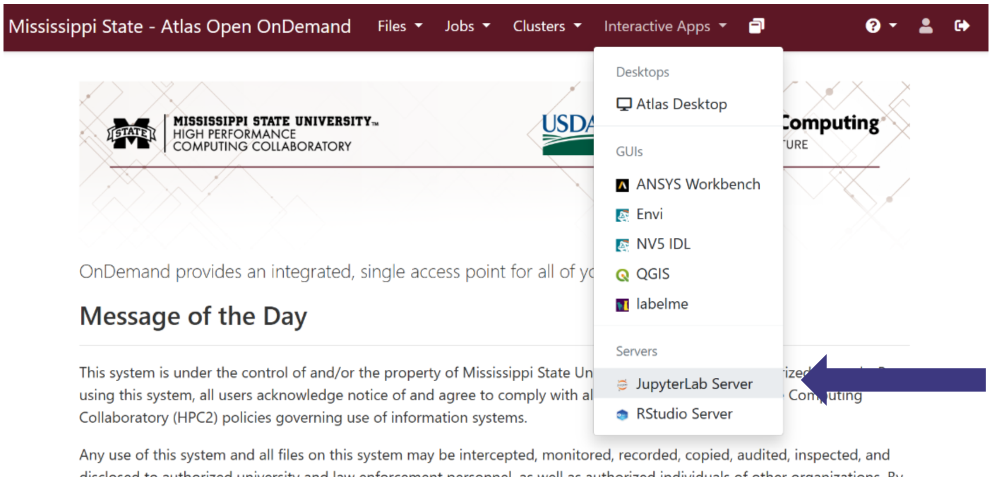
Using Atlas requires that you have a SCINet account.

Launching a JupyterLab session on Atlas involves specifying the resources that your session will use. The job scheduler on Atlas needs information about the resources your job will need and the account to use. See the details below for the settings to use.

We will use the Open OnDemand (OOD) web interface to launch and connect to Jupyter sessions. OOD provides an easy interface to provide the resource request, submit the job to the scheduler, and connect to the Jupyter server once it starts.

Steps to launch a JupyterLab session

- Login at: https://atlas-ood.hpc.msstate.edu/pun/sys/dashboard
- Click on the **Interactive Apps** menu and select **Jupyter**



OnDemand provides an integrated, single access point for all of yo

Message of the Day

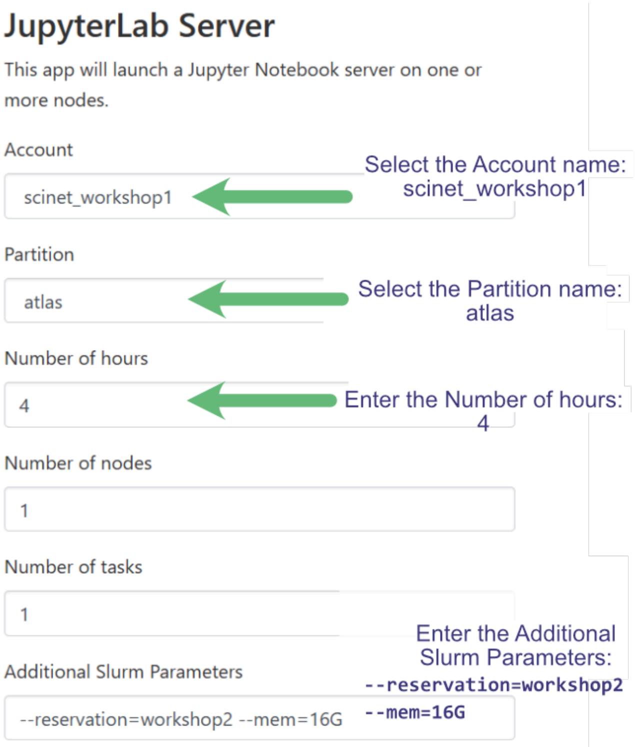
This system is under the control of and/or the property of Mississippi State Un using this system, all users acknowledge notice of and agree to comply with al Collaboratory (HPC2) policies governing use of information systems.

Any use of this system and all files on this system may be intercepted, monitored, recorded, copied, audited, inspected, and

- The next screen allows you to request resources to run a job on Atlas.

- See the image for reference, but the suggested resource request for most of the *Practicum AI* courses is:
    - Account Name: **scinet_workshop1**
    - Partition Name: **atlas**
    - Number of hours: **4**
    - Number of nodes: **1**
    - Number of tasks: **1**
    - Additional Slurm Parameters:
        - **--reservation=workshop2 --mem=16G**

- After entering the information, click the Launch button.



JupyterLab Server

This app will launch a Jupyter Notebook server on one or more nodes.

Account: scinet_workshop1

Select the Account name: scinet_workshop1

Partition: atlas

Select the Partition name: atlas

Number of hours: 4

Enter the Number of hours: 4

Number of nodes: 1

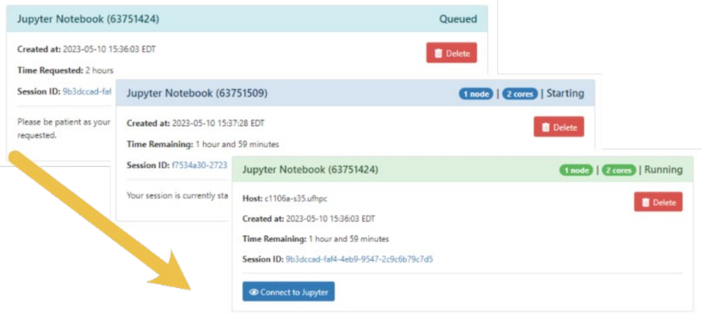
Number of tasks: 1

Additional Slurm Parameters: --reservation=workshop2 --mem=16G

Enter the Additional Slurm Parameters: `--reservation=workshop2 --mem=16G`

- On the next page, your job will have a card. The card will start with a light blue border with “Queued” in the upper right. That means your job has been submitted to the scheduler and is waiting for the scheduler to find resources (or for them to be available in your group’s allocation). Once the resources are available, the card will change to a dark blue border with “Starting” and finally, when your job is ready, it will have a green border, say “Running” and have a button to click to “**Connect to Jupyter**”.

- Clicking the Connect to Jupyter button will open a new tab and should open with a window like what is pictured below—on future connections, it will normally open with the documents you left opened last time.



Jupyter Notebook (63751424) Queued

Created at: 2023-05-10 15:36:03 EDT

Time Requested: 2 hours

Session ID: 9b3dccad-faf

Please be patient as your requested.

Jupyter Notebook (63751509) 1 node | 2 cores | Starting

Created at: 2023-05-10 15:37:28 EDT

Time Remaining: 1 hour and 59 minutes

Session ID: f7534a30-2723

Your session is currently sta

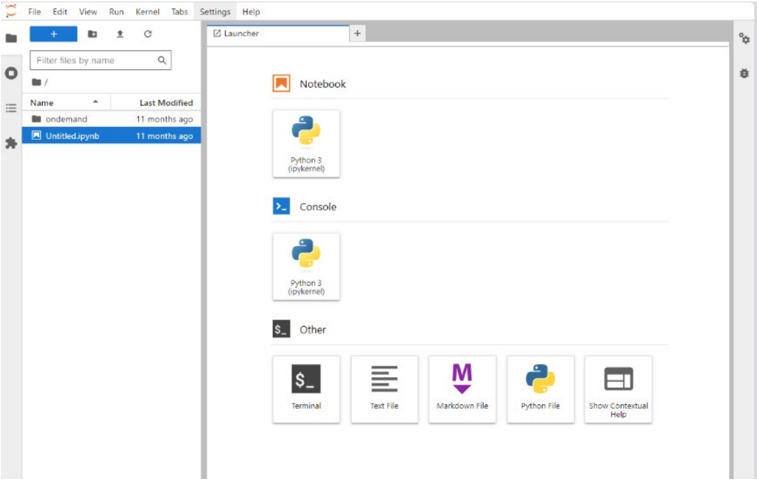
Jupyter Notebook (63751424) 1 node | 2 cores | Running

Host: c1106a-s35.ufhpc

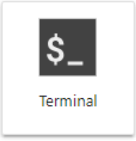
Created at: 2023-05-10 15:36:03 EDT

Time Remaining: 1 hour and 59 minutes

Session ID: 9b3dccad-faf4-4eb9-9547-2c9c6b79c7d5



Step 3: Creating the kernel for this workshop



- Once you have started your Jupyter session, you will need to create the kernel for this workshop.
- Click on the Terminal card (see image).
- **Setup the kernel for JupyterLab.** You will create a kernel called *python_for_ai_env* to access from JupyterLab Server. Run the following commands to activate the workshop's virtual environment and create a new kernelspec from it:

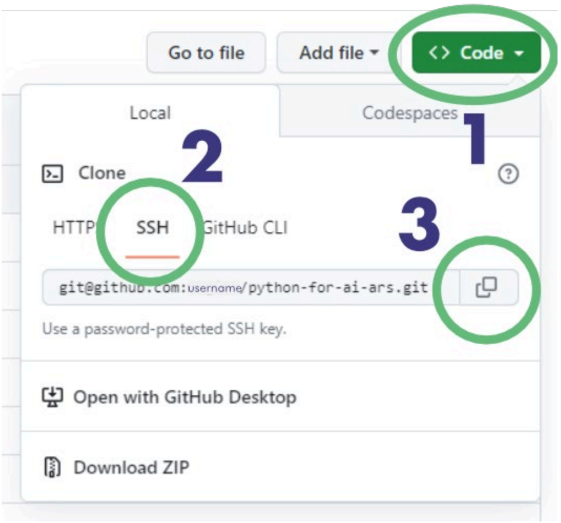
```
source /project/scinet_workshop1/python_for_ai/python_for_ai_env/bin/activate

ipython kernel install --name "python_for_ai_env" --user
```

Step 4: Cloning your repository onto the HPC system

- In a different tab, go to your GitHub repository for this course. It should be at https://github.com/ then your GitHub username, then the repository name you provided, e.g. "python-for-ai-ars".
- Click on the following three buttons:

1. The "<> Code" button
2. The SSH button (assuming you have set up your SSH keys)
3. The copy button to copy the URL.
    - See the image for reference.



git@github.com:username/python-for-ai-ars.git

Use a password-protected SSH key.

- Return to your Jupyter tab and either return to the terminal or click on the Terminal Icon to open a new terminal.
- We can clone the git repository from GitHub by typing:

```
git clone <paste in your URI copied in step 3 above>
```

- There should now be a folder called “python-for-ai-ars” in the left navigation pane. Click the folder to open it.
- **Open the 01_brief_intro_python.ipynb** notebook.
- Read through the notebook and follow the exercises.