

# Things to Do While You are Waiting

- Open your web browser and visit [hprc.tamu.edu](http://hprc.tamu.edu)
- Log into TAMU VPN (if you're off campus) and reconnect to Zoom
- If you don't have an HPRC account, please ask\*

\*speak up in chat or email [help@hprc.tamu.edu](mailto:help@hprc.tamu.edu)

# Introduction to Python

with exercises using HPRC Portal

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# Outline

- Ain't nobody got time for an outline

Let's GO

# Follow Along

Short course material can be found on the short course page.

[https://hprc.tamu.edu/training/intro\\_python.html](https://hprc.tamu.edu/training/intro_python.html)

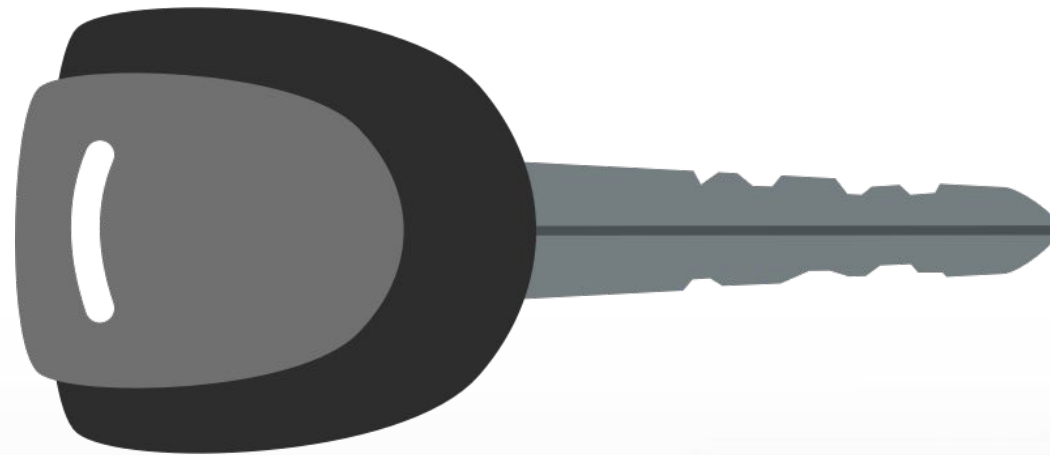
And on disk on Grace

```
/scratch/training/Intro-python
```

```
Intro_Python_spring22_Portal.ipynb (Download to your PC  
or copy to $SCRATCH)
```

```
Intro Python spring22 Colab.ipynb (Save a copy in Drive)
```

# Getting Started



# Authentication and Access

Three steps to access HPRC resources.

1. Get a HPRC account
2. VPN to TAMU campus
3. Web login (**Portal**, Globus) through CAS  
or  
**SSH/SFTP to HPRC clusters**

- Duo NetID two-factor authentication used to enhance security ([it.tamu.edu/duo/](http://it.tamu.edu/duo/))
- (Faculty and staff) Use Duo Keys - [u.tamu.edu/get\\_duo\\_keys](http://u.tamu.edu/get_duo_keys)
- Instructions in two-factor wiki page ([hprc.tamu.edu/wiki/Two\\_Factor](http://hprc.tamu.edu/wiki/Two_Factor))

## Example: SSH login with Duo

```
$ ssh grace.tamu.edu
```

```
*****
```

```
.... warning message (snipped) .....
```

```
*****
```

**Password:**

Duo two-factor login for UserNetID

Enter a passcode or select one of the following options:

1. Duo Push to XXX-XXX-1234
2. Phone call to XXX-XXX-1234
3. SMS passcodes to XXX-XXX-1234 (next code starts with: 9)

Passcode or option (1-3): 1

Success. Logging you in...

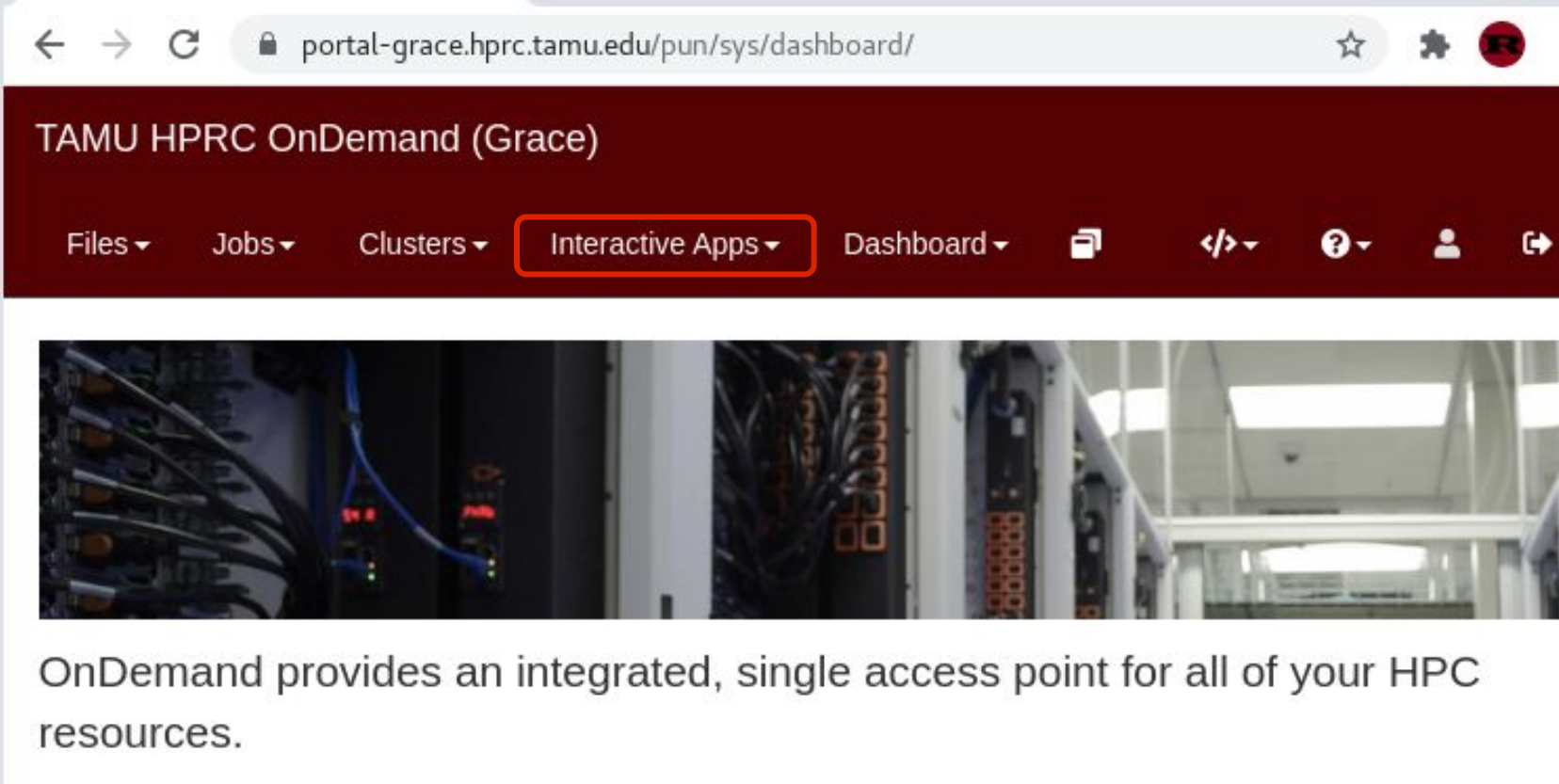
# Hands-on exercises:

## Activate TAMU VPN

Go to: [portal.hprc.tamu.edu](https://portal.hprc.tamu.edu)  
and select: **Grace**

Once you have logged in, respond to a poll


# portal.hprc.tamu.edu



portal-grace.hprc.tamu.edu/pun/sys/dashboard/

TAMU HPRC OnDemand (Grace)

Files ▾ Jobs ▾ Clusters ▾ **Interactive Apps ▾** Dashboard ▾



OnDemand provides an integrated, single access point for all of your HPC resources.

- [Files](#) > copy and edit files on the cluster's filesystems
- [Jobs](#) > submit and monitor cluster jobs
- [Clusters](#) > open a shell terminal (command line) on a login node
- [Interactive Apps](#) > start graphical software on a compute node and connect to it
- [Dashboard](#) > view file quotas and computing account allocations



# Launch Interactive Apps

## Navigate

- Menu > Interactive Apps > TESTING > Jupyter Notebook (TESTING)

## Choose an Type of environment

- Module load + ...

## Choose a Module

- Python/3.8.6

### Jupyter Notebook (TESTING)

version: 3205f76

This app will launch a [Jupyter Notebook](#) server on the [Grace cluster](#).

**Notice:** This form has changed. Please pay attention to what options you select and what the defaults are.

#### Type of environment

Module load + Python virtualenv

Select the type of environment in which Jupyter is installed. [Help me choose](#)

#### Module selected

Python/3.8.6

Select a module to load. All modules listed will also load the appropriate Python and Jupyter by default.

# Launch Interactive Apps

Leave “optional environment” *blank*

Choose a Number of hours

- 3 hours

Launch

**Number of hours**

**Number of cores:**

Specify the number of cores [1-48] allocated on a node from the [Grace cluster](#).

**Total memory (GB)**

Requested total memory (2 - 360GB)

**Node type**

Choose "GPU" if the notebook needs to run on an Nvidia GPU node.

**Account**

This field is optional.

**Email**

This field is optional.

Launch

# Connect to Interactive Apps

- Portal submits a job to the cluster
- Jupyter server runs on a Node
- Wait (about minute), Refresh page, Connect to Jupyter.

The screenshot illustrates the lifecycle of a Jupyter Notebook job on a cluster. It shows three overlapping panels representing different stages of the job's execution:

- Queued State (Top Panel):** The job is titled "Jupyter Notebook (TESTING) (1409525)" and is in a "Queued" state. It was created at 2021-10-07 16:13:42 CDT, requested 3 hours, and has a session ID of fc121577-0537-47a1-9988-d1b1c314361f. A red "Delete" button is visible.
- Starting State (Middle Panel):** The job is now "Starting" with "1 node" and "1 core". The "Time Remaining" is 2 hours and 59 minutes. A "Delete" button is also present.
- Running State (Bottom Panel):** The job is now "Running" with "1 node" and "1 core". The "Host" is identified as >\_c622. The "Time Remaining" remains at 2 hours and 59 minutes. A "Delete" button is present, and a blue "Connect to Jupyter" button is available at the bottom.

Text from the background interface includes: "Please be patient depends on the" and "Your session is process can tak".

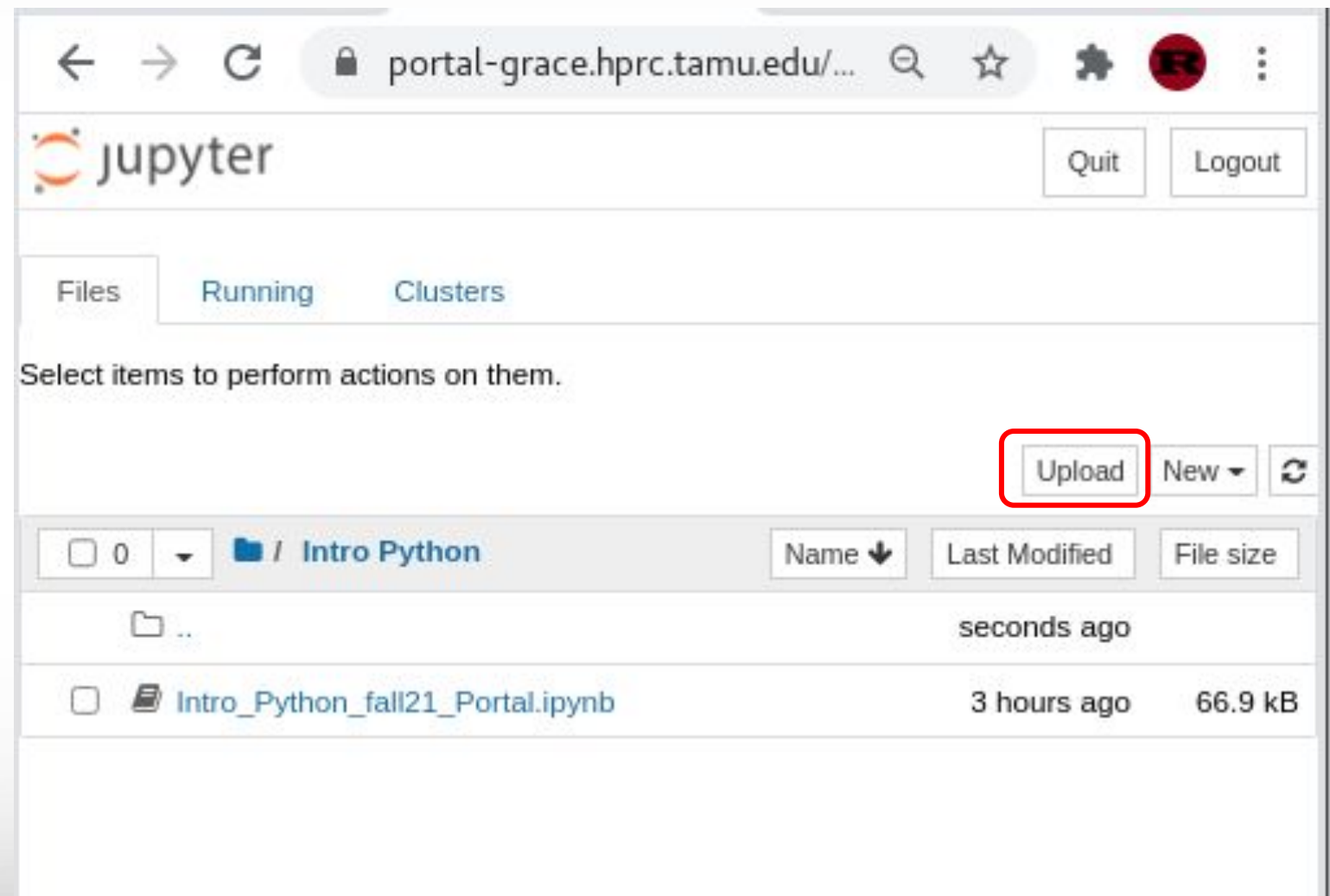
# Interactive Apps

Jupyter starts in a File Browser.

Upload the file

`Intro_Python_fall21_Portal.ipynb`

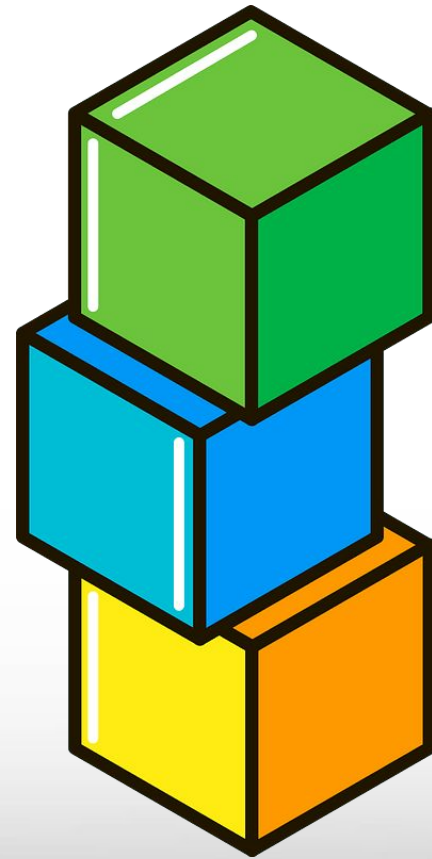
Click the **file name** to open the file.



# Hands-on exercises: Launch a Jupyter Notebook

Once you have the notebook open,  
respond to a poll

# Python Basics



(continued in Python Notebook)

# Need Help?

- Try these:
  - First check the FAQ [hprc.tamu.edu/wiki/HPRC:CommonProblems](http://hprc.tamu.edu/wiki/HPRC:CommonProblems)
  - Also try the Grace User Guide [hprc.tamu.edu/wiki/Grace](http://hprc.tamu.edu/wiki/Grace)
  - Email your questions to [help@hprc.tamu.edu](mailto:help@hprc.tamu.edu). (Managed by a ticketing system)
- Help us, help you -- we need more info
  - Which Cluster
  - UserID/NetID (*UIN is not needed!*)
  - Job id(s) if any
  - Location of your jobfile, input/output files
  - Application used if any
  - Module(s) loaded if any
  - Error messages
  - Steps you have taken, so we can reproduce the problem
- Or visit us @ 218A Blocker (Making an appointment is recommended.)





**HIGH PERFORMANCE  
RESEARCH COMPUTING**  
TEXAS A&M UNIVERSITY

**Thank you.**

Please fill out the post-course Survey.

“really very please do; it matters  
to me personally.” - Richard