

Tutorial: Python for Programmers (new to Python) on **ACES**

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2025/02/11



High Performance
Research Computing
DIVISION OF RESEARCH



Outline

- Overview of Python
- Getting Started
- Control
- Data Structures

Overview of Python

About Python

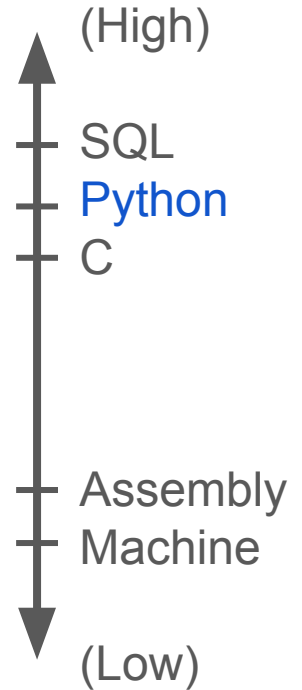


What is Python like?

Python is a High-level language, which means:

- Syntax is similar to human language syntax
- Supports abstract concepts
- Takes care of mundane hardware tasks for you

Python is designed to simplify the development process so you can focus on what matters.



Is Python right for me?

No programming language is perfect for every task.

Python is best for research and rapid development.

Pros

- Easy to use
- Modules are readily available
- Portable

Cons

- Not the fastest
- Source code style is mandatory

Learning Resources

- Slides on the course web page
https://hprc.tamu.edu/training/aces_python4programmers.html
- HPRC's Knowledge Base
<https://hprc.tamu.edu/kb/Software/Python/>
- HPRC on YouTube
<https://www.youtube.com/c/TexasAMHPRC>
- ACCESS Links
<https://support.access-ci.org/ci-links>

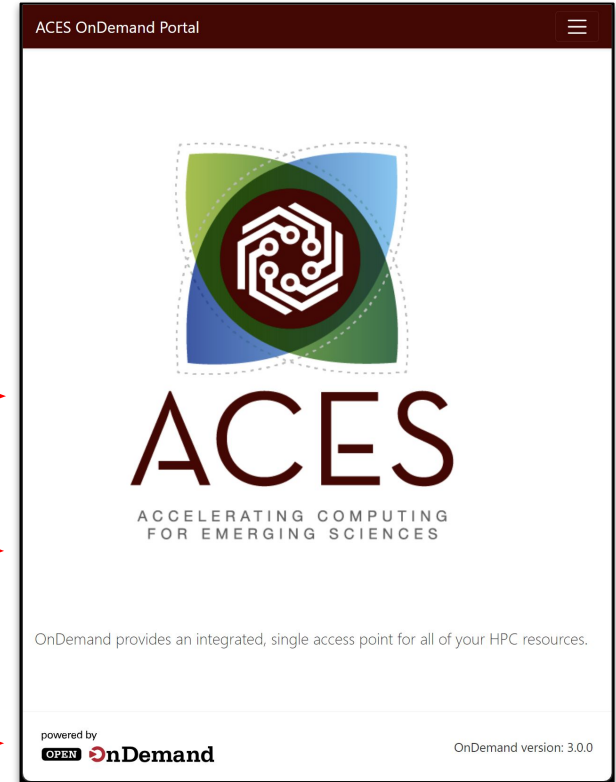
Getting Started

ACES Portal

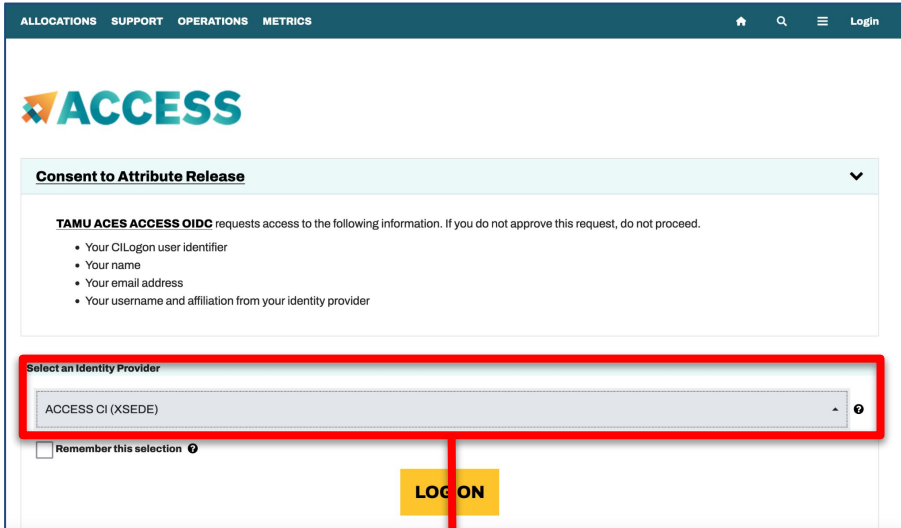


ACES Portal portal-aces.hprc.tamu.edu
is the web-based user interface for the ACES cluster

Open OnDemand (OOD) is an advanced web-based
graphical interface framework for HPC users



Accessing ACES via the Portal (ACCESS)



The screenshot shows the ACCESS portal interface. At the top is a navigation bar with links: ALLOCATIONS, SUPPORT, OPERATIONS, METRICS, and a Login link. Below the navigation bar is the ACCESS logo. A section titled "Consent to Attribute Release" is expanded, showing a message from TAMU ACES ACCESS OIDC requesting access to user information. Below this is a "Select an Identity Provider" dropdown menu, which is highlighted with a red rectangle. The dropdown shows "ACCESS CI (XSEDE)" as the selected option. Below the dropdown is a checkbox labeled "Remember this selection". A yellow "LOG ON" button is positioned below the dropdown menu.

ALLOCATIONS SUPPORT OPERATIONS METRICS Login

ACCESS

Consent to Attribute Release

TAMU ACES ACCESS OIDC requests access to the following information. If you do not approve this request, do not proceed.

- Your CILogon user identifier
- Your name
- Your email address
- Your username and affiliation from your identity provider

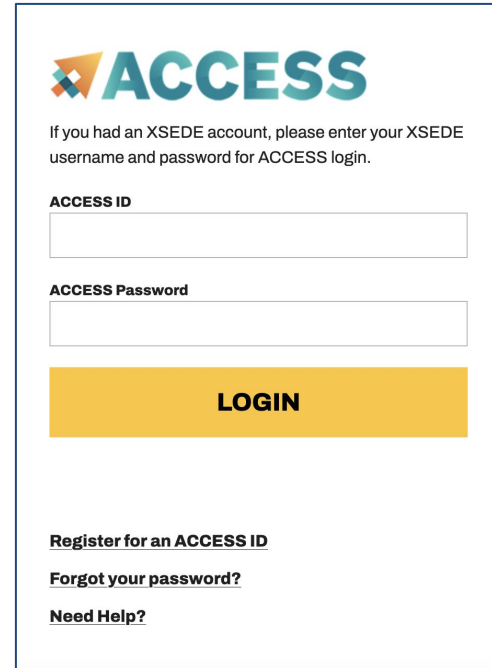
Select an Identity Provider

ACCESS CI (XSEDE)

☐ Remember this selection

LOG ON

Select the Identity Provider appropriate for your account.



The screenshot shows the ACCESS portal login page. At the top is the ACCESS logo. Below the logo is a message: "If you had an XSEDE account, please enter your XSEDE username and password for ACCESS login." Below this message are two input fields: "ACCESS ID" and "ACCESS Password". Below the input fields is a yellow "LOGIN" button. At the bottom of the page are three links: "Register for an ACCESS ID", "Forgot your password?", and "Need Help?".

ACCESS

If you had an XSEDE account, please enter your XSEDE username and password for ACCESS login.

ACCESS ID

ACCESS Password

LOGIN

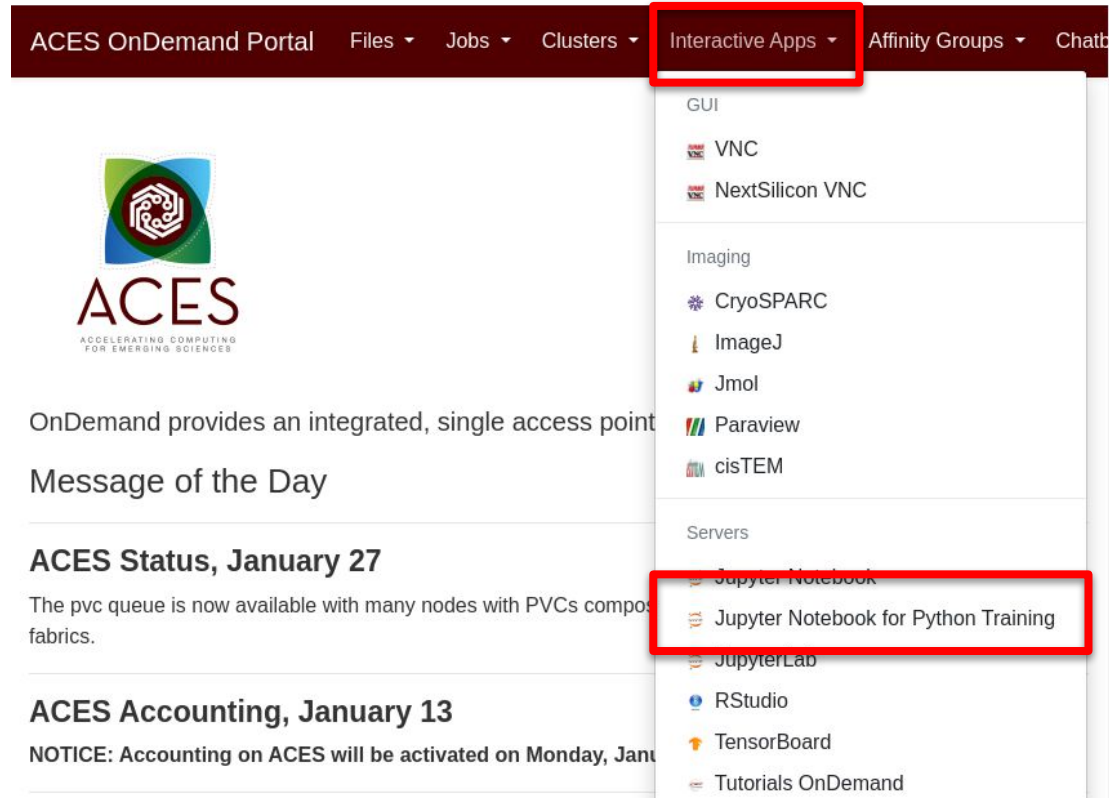
[Register for an ACCESS ID](#)

[Forgot your password?](#)

[Need Help?](#)

Log-in using your ACCESS or institutional credentials.

Jupyter Notebook for Python Training



The screenshot displays the ACES OnDemand Portal interface. The top navigation bar is dark red with white text for 'ACES OnDemand Portal', 'Files', 'Jobs', 'Clusters', 'Interactive Apps', 'Affinity Groups', and 'Chat'. The 'Interactive Apps' menu is open, showing a list of applications: GUI, VNC, NextSilicon VNC, Imaging, CryoSPARC, ImageJ, Jmol, Paraview, cisTEM, Servers, Jupyter Notebook, Jupyter Notebook for Python Training, JupyterLab, RStudio, TensorBoard, and Tutorials OnDemand. The 'Jupyter Notebook for Python Training' option is highlighted with a red box. The main content area on the left features the ACES logo (a stylized green and blue square with a white circuit-like pattern) and the text 'ACES ACCELERATING COMPUTING FOR EMERGING SCIENCES'. Below the logo, there is a section titled 'OnDemand provides an integrated, single access point' followed by a 'Message of the Day' section. The 'Message of the Day' section includes the heading 'ACES Status, January 27' and the text 'The pvc queue is now available with many nodes with PVCs composed of fabrics.' Below this is another section titled 'ACES Accounting, January 13' with the text 'NOTICE: Accounting on ACES will be activated on Monday, Jan'.

ACES OnDemand Portal Files Jobs Clusters **Interactive Apps** Affinity Groups Chat

GUI

- VNC
- NextSilicon VNC

Imaging

- CryoSPARC
- ImageJ
- Jmol
- Paraview
- cisTEM

Servers

- Jupyter Notebook
- Jupyter Notebook for Python Training**
- JupyterLab
- RStudio
- TensorBoard
- Tutorials OnDemand

ACES
ACCELERATING COMPUTING
FOR EMERGING SCIENCES

OnDemand provides an integrated, single access point

Message of the Day

ACES Status, January 27

The pvc queue is now available with many nodes with PVCs composed of fabrics.

ACES Accounting, January 13

NOTICE: Accounting on ACES will be activated on Monday, Jan

Jupyter Notebook for Python Training

Jupyter Notebook for Python Training

This app will launch a Jupyter Notebook server on the ACES cluster.

Email

This field is optional.

Launch

* The Jupyter Notebook for Python Training session data for this session can be accessed under the [data root directory](#).

Jupyter Notebook for Python Training (636884)

1 node | 1 core | Starting

Create

Time

Session

Your session

take a

Jupyter Notebook for Python Training (636884)

1 node | 1 core | Running

Host: >_ ac058

Delete

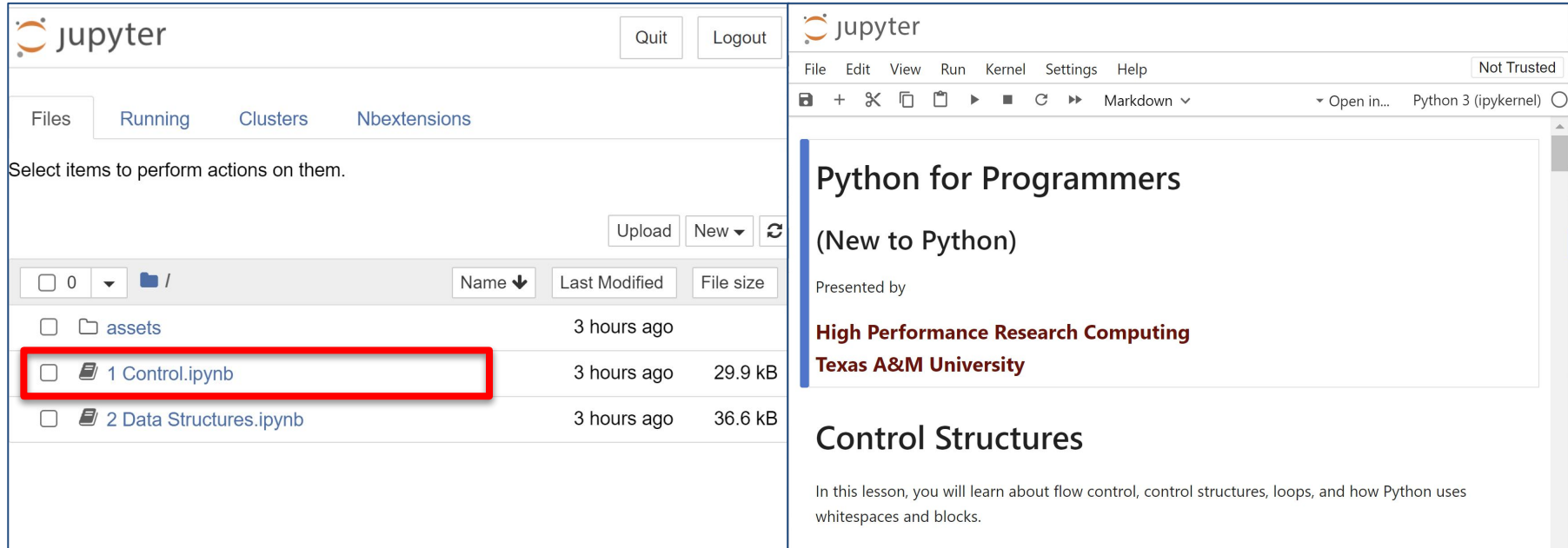
Created at: 2025-01-28 09:19:34 CST

Time Remaining: 7 hours and 9 minutes

Session ID: 428342db-6782-4d59-8bf8-2537d8ee857d

Connect to Jupyter

Jupyter Notebook for Python Training



The screenshot displays the Jupyter Notebook web interface. On the left, the 'Files' tab is active, showing a file browser. The file list includes 'assets', '1 Control.ipynb', and '2 Data Structures.ipynb'. The file '1 Control.ipynb' is highlighted with a red rectangle. On the right, the notebook '1 Control.ipynb' is open, showing the title 'Python for Programmers (New to Python)' and the content 'Control Structures'.

Jupyter Notebook Interface Components:

- Top Bar:** Jupyter logo, 'Quit' and 'Logout' buttons.
- Navigation Tabs:** Files, Running, Clusters, Nbextensions.
- File Browser:** Select items to perform actions on them. Buttons: Upload, New, Refresh.
- File List:**

	Name	Last Modified	File size
<input type="checkbox"/>	0 /		
<input type="checkbox"/>	assets	3 hours ago	
<input type="checkbox"/>	1 Control.ipynb	3 hours ago	29.9 kB
<input type="checkbox"/>	2 Data Structures.ipynb	3 hours ago	36.6 kB
- Notebook Header:** Jupyter logo, 'Not Trusted' status, menu (File, Edit, View, Run, Kernel, Settings, Help), toolbar (Save, Copy, Paste, Undo, Redo, Run, Stop, Restart, Clear, Help), 'Open in...' dropdown, 'Python 3 (ipykernel)'.
- Notebook Content:**

Python for Programmers

(New to Python)

Presented by

High Performance Research Computing
Texas A&M University

Control Structures

In this lesson, you will learn about flow control, control structures, loops, and how Python uses whitespaces and blocks.



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

<https://hprc.tamu.edu>

HPRC Helpdesk:

help@hprc.tamu.edu

Phone: 979-845-0219

Take our short course survey!



HPRC Survey

https://u.tamu.edu/hprc_shortcourse_survey

Help us help you. Please include details in your request for support, such as, Cluster (ACES, FASTER, Grace, Launch), NetID (UserID), Job information (JobID(s), Location of your jobfile, input/output files, Application, Module(s) loaded, Error messages, etc), and Steps you have taken, so we can reproduce the problem.

