

GETTING STARTED WITH RIVANNA AND JUPYTER NOTEBOOKS

Connecting to Rivanna with Open onDemand

Copying Files

Starting a JupyterLab Session

Running a Notebook

Table of Contents

- For this workshop, we will be running a Jupyter Notebook on Rivanna
- The remainder of these slides will explain how to
 - Connect to Rivanna
 - Copy a sample Notebook to your account
 - Start a JupyterLab session on Rivanna
 - Run the sample Notebook

Connect to Rivanna

- You will be using our web portal, called Open onDemand, to connect to Rivanna.
- To access Open OnDemand, open your web browser and type <https://rivanna-portal.hpc.virginia.edu>

You will need to authenticate with Netbadge (i.e., “Netbadge” in).

- After you log in, you will see the Dashboard (shown on following slide).

Open onDemand Dashboard

UVA OpenOnDemand

Files


Jobs

Clusters

Interactive Apps

Help

Log Out

 UNIVERSITY
of VIRGINIA

Research Computing


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

Message of the Day

2019-10-08 Scratch Directory

RC system engineers will begin actively clearing /scratch files more than 90 days old **beginning 10/14/2019**. /scratch is intended as temporary storage (90 days maximum) for active work. It is not backed up and needs to be purged periodically in order to maintain a stable HPC environment. We encourage users to back up their important data. RC offers several low-cost storage options to researchers. For more information, visit <https://www.rc.virginia.edu/userinfo/rivanna/storage/>

powered by

OPEN  **nDemand**

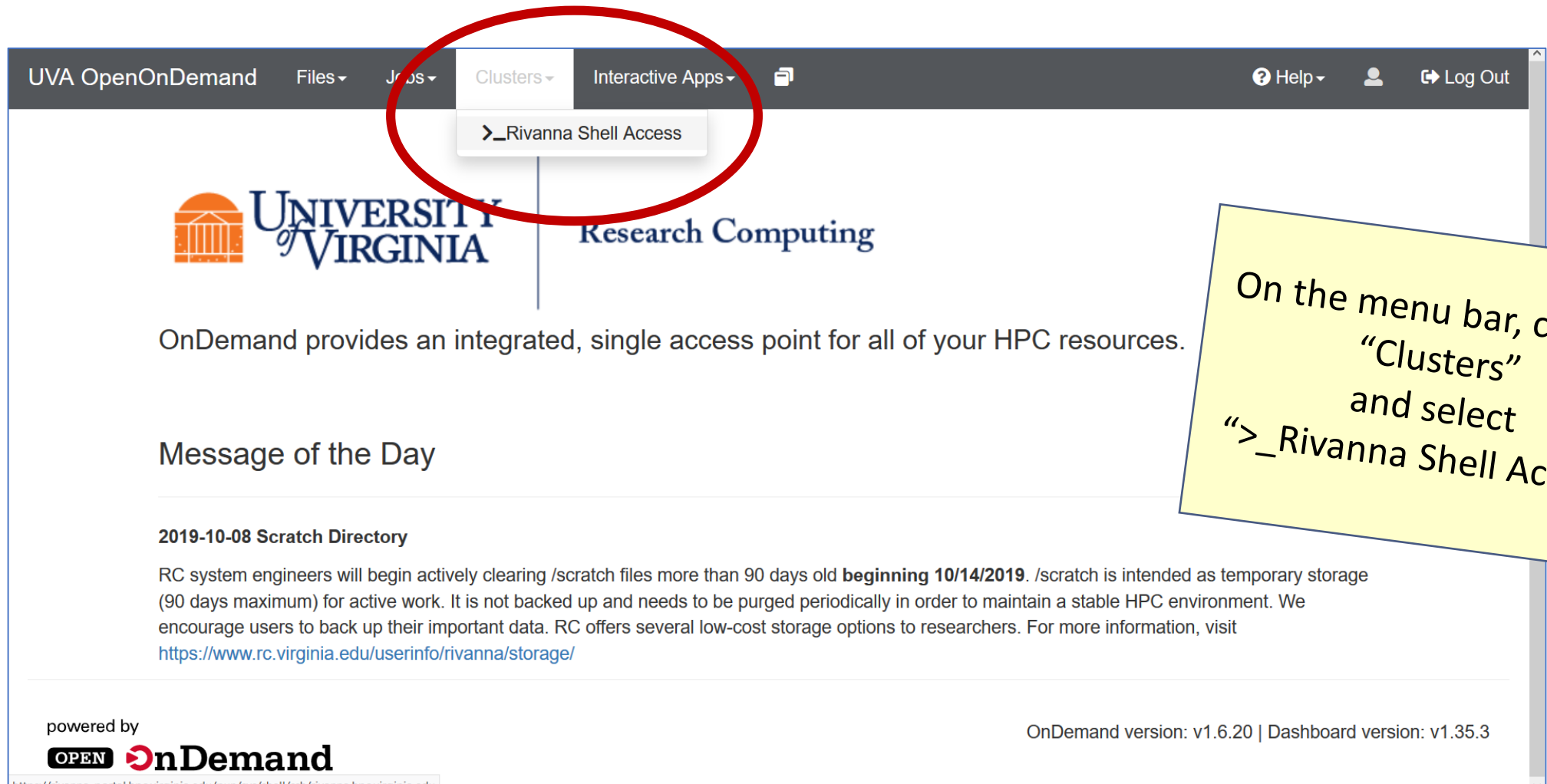
OnDemand version: v1.6.20 | Dashboard version: v1.35.3

*Congratulations!
When you see this page,
you are connected to
Rivanna*

Copying the Notebook to your Account


- To get a copy of the sample Jupyter Notebook in your account, you will open a shell (i.e., a terminal window) and use a command to copy the Notebook (plus other necessary files) from a git repository to your account.
- The next two slides will show how to do these steps.

Open a Shell



UVA OpenOnDemand Files Jobs Clusters Interactive Apps Help Log Out

>_Rivanna Shell Access


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OnDemand version: v1.6.20 | Dashboard version: v1.35.3

On the menu bar, click on "Clusters" and select ">_Rivanna Shell Access"

The Shell

- A new tab will open with a black window and words like "Authorized Use Only!".

```
Last login: Sun Oct 25 22:44:16 2020 from 172.18.34.57
Authorized Use Only!
-bash-4.2$
```

- This is your shell.

Command to Copy Files

- Type the following in the shell:

```
git clone git@github.com:jhuband/TurningtheKnobs.git
```

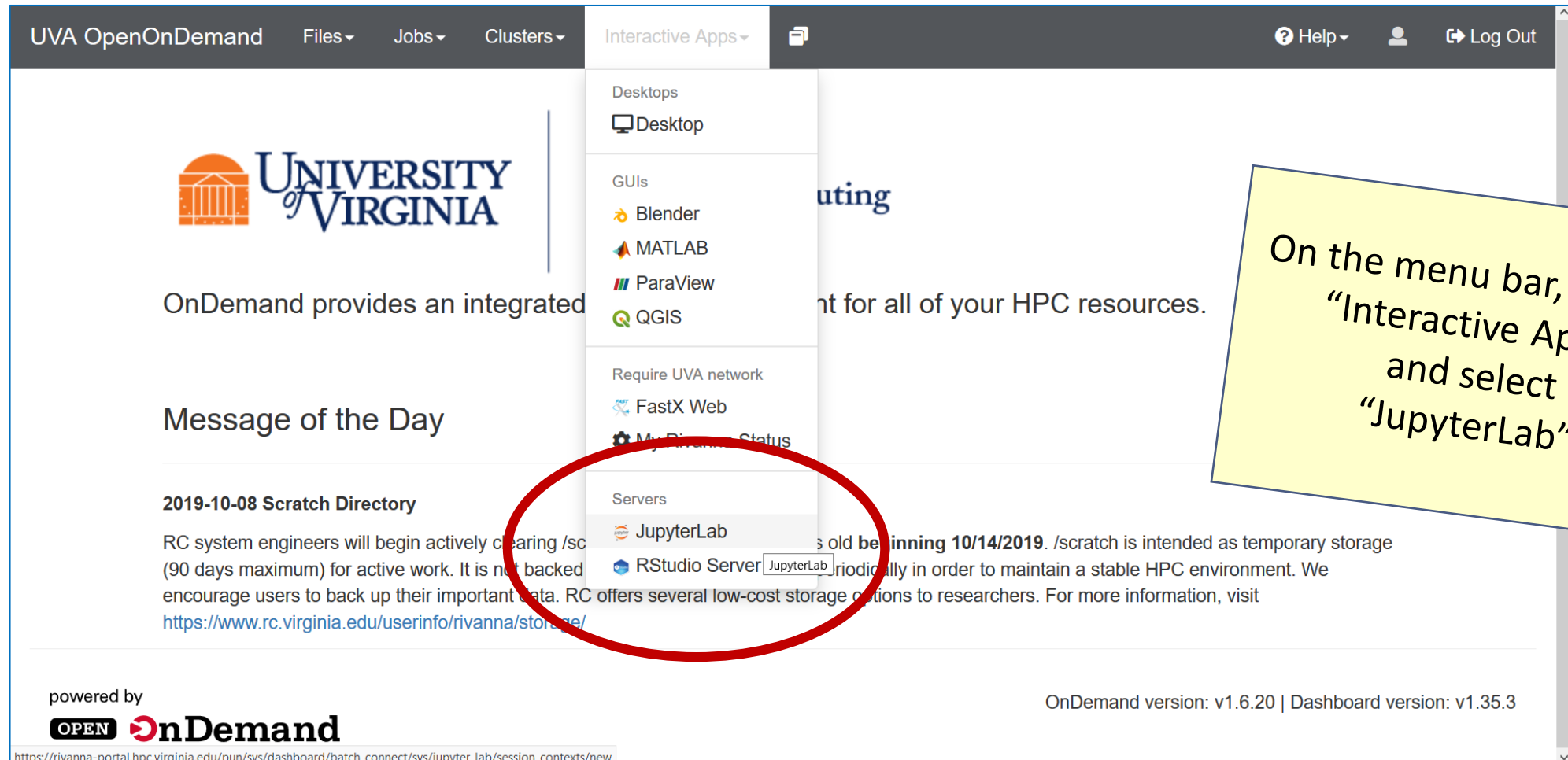

Exit out of the Shell

- You are now done with your shell, you can exit from it by closing the tab and clicking on “Leave page”.
- You should be back at the Open onDemand dashboard.
 - If not, click the tab on your browser that is labeled “Dashboard”.
 - If that fails, re-enter <https://rivanna-portal.hpc.virginia.edu> in you web browser.

Starting JupyterLab

- Before you can open up a Jupyter Notebook, you will need to request a Jupyter session on Rivanna and provide some details for the resources that the Notebook needs. (For example, our sample Notebook needs to run on a GPU.)
- The next several slides will take you through the steps to start a JupyterLab session.

Select JupyterLab from Interactive Apps



The screenshot shows the UVA OpenOnDemand dashboard. The top navigation bar includes 'UVA OpenOnDemand', 'Files', 'Jobs', 'Clusters', 'Interactive Apps', 'Help', and 'Log Out'. The 'Interactive Apps' dropdown menu is open, showing categories: Desktops (Desktop), GUIs (Blender, MATLAB, ParaView, QGIS), Require UVA network (FastX Web, My Rivaana Status), and Servers (JupyterLab, RStudio Server). The 'JupyterLab' option is highlighted with a red circle. A yellow callout box points to the 'Interactive Apps' menu with the text: 'On the menu bar, click on "Interactive Apps" and select "JupyterLab"'. The main content area features the University of Virginia logo, a message about OnDemand integration, a 'Message of the Day', and a '2019-10-08 Scratch Directory' announcement. The footer includes the OpenOnDemand logo and version information.

UVA OpenOnDemand Files Jobs Clusters Interactive Apps Help Log Out

Desktops
Desktop

GUIs
Blender
MATLAB
ParaView
QGIS

Require UVA network
FastX Web
My Rivaana Status

Servers
JupyterLab
RStudio Server

On the menu bar, click on "Interactive Apps" and select "JupyterLab"

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OnDemand provides an integrated

Message of the Day

2019-10-08 Scratch Directory

RC system engineers will begin actively clearing /scratch (90 days maximum) for active work. It is not backed up. RC offers several low-cost storage options to researchers. For more information, visit <https://www.rc.virginia.edu/userinfo/rivanna/storage/>

powered by OPEN OnDemand

OnDemand version: v1.6.20 | Dashboard version: v1.35.3

https://rivanna-portal.hpc.virginia.edu/pun/sys/dashboard/batch_connect/sys/jupyter_lab/session_contexts/new

JupyterLab Session Selections (1/3)

UVA OpenOnDemand Files Jobs Clusters Interactive Apps Help

Home / My Interactive Sessions / JupyterLab

Interactive Apps

Desktops

Desktop

GUIs

Blender

MATLAB

ParaView

QGIS

Servers

JupyterLab

RStudio Server

JupyterLab

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

Rivanna Partition

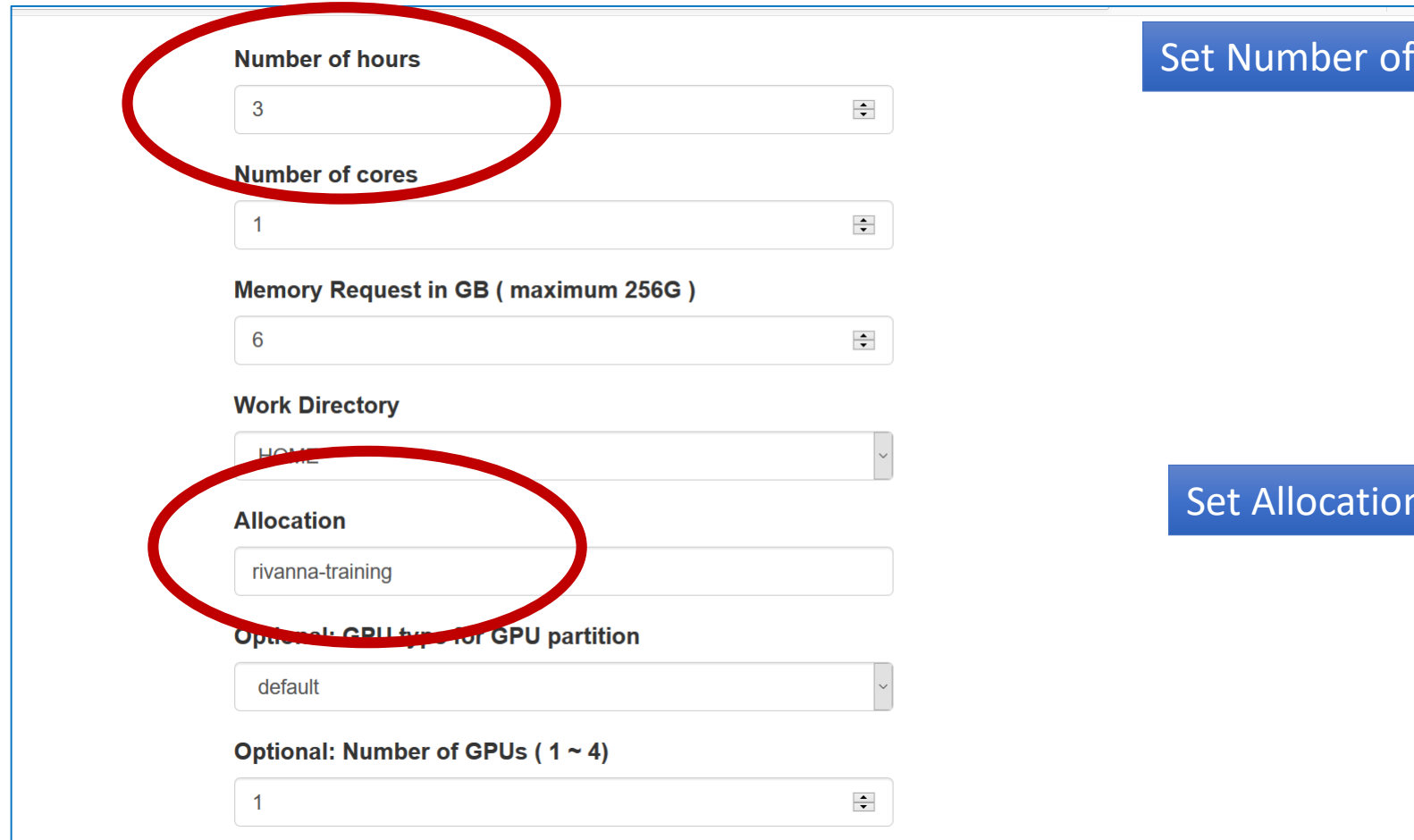
GPU

- **Standard** - (1-40 cores) Rivanna node in the standard partition
- **Bii,Bii-gpu** - (1-40 cores) Rivanna partition for Biocomplexity Institute and Initiative.
- **GPU** - (1-28 cores) Rivanna node that has NVIDIA GPU.
- **Dev** - (1-8 cores) For short sessions (= 1 hour) with no SU charge; walltime is strictly limited to an hour.
- **Instructional** - (1-20 cores) Rivanna node in the instructional partition.
- **Learn More** - [Rivanna Queuing Policies](#)

Select the GPU Partition

To fill out the webform, follow the instructions on this and the two subsequent slides.

JupyterLab Session Selections (2/3)



The screenshot shows a JupyterLab session selection form. Two red ovals highlight the 'Number of hours' and 'Allocation' fields. The 'Number of hours' field is set to 3. The 'Allocation' field is set to 'rivanna-training'. Other fields include 'Number of cores' (1), 'Memory Request in GB (maximum 256G)' (6), 'Work Directory' (HOME), 'Optional: GPU type for GPU partition' (default), and 'Optional: Number of GPUs (1 ~ 4)' (1).

Field	Value
Number of hours	3
Number of cores	1
Memory Request in GB (maximum 256G)	6
Work Directory	HOME
Allocation	rivanna-training
Optional: GPU type for GPU partition	default
Optional: Number of GPUs (1 ~ 4)	1

Set Number of hours to 3

Set Allocation to rivanna-training

JupyterLab Session Selections (3/3)

Allocation:

rivanna-training

Optional: GPU type for GPU partition

default

Optional: Number of GPUs (1 ~ 4)

1

Optional: Slurm Option

Optional: Group

☐ I would like to receive an email when the session starts

Launch

* The JupyterLab session data for this session can be accessed under the [data root directory](#).

Set the number of GPUs to 1

Click on Launch

Wait for the Session to Start


JupyterLab (12492035) Queued

Created at: 2020-05-29 00:18:04 EDT

Time Requested: 3 hours

Session ID: 5763459f-60b3-4af3-a4f4-379d56a61354

Please be patient as your job currently sits in queue. The wait time depends on the number of cores as well as time requested.




JupyterLab (12492035) 1 node | 1 core | Running

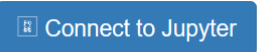
Host: >_udc-ba25-23

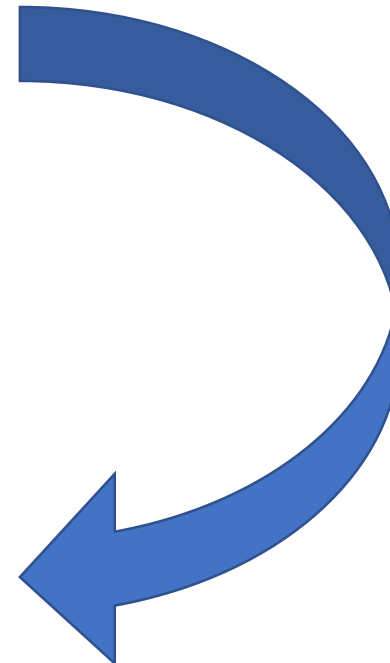
Created at: 2020-05-29 00:18:04 EDT

Time Remaining: 2 hours and 59 minutes

Session ID: 5763459f-60b3-4af3-a4f4-379d56a61354



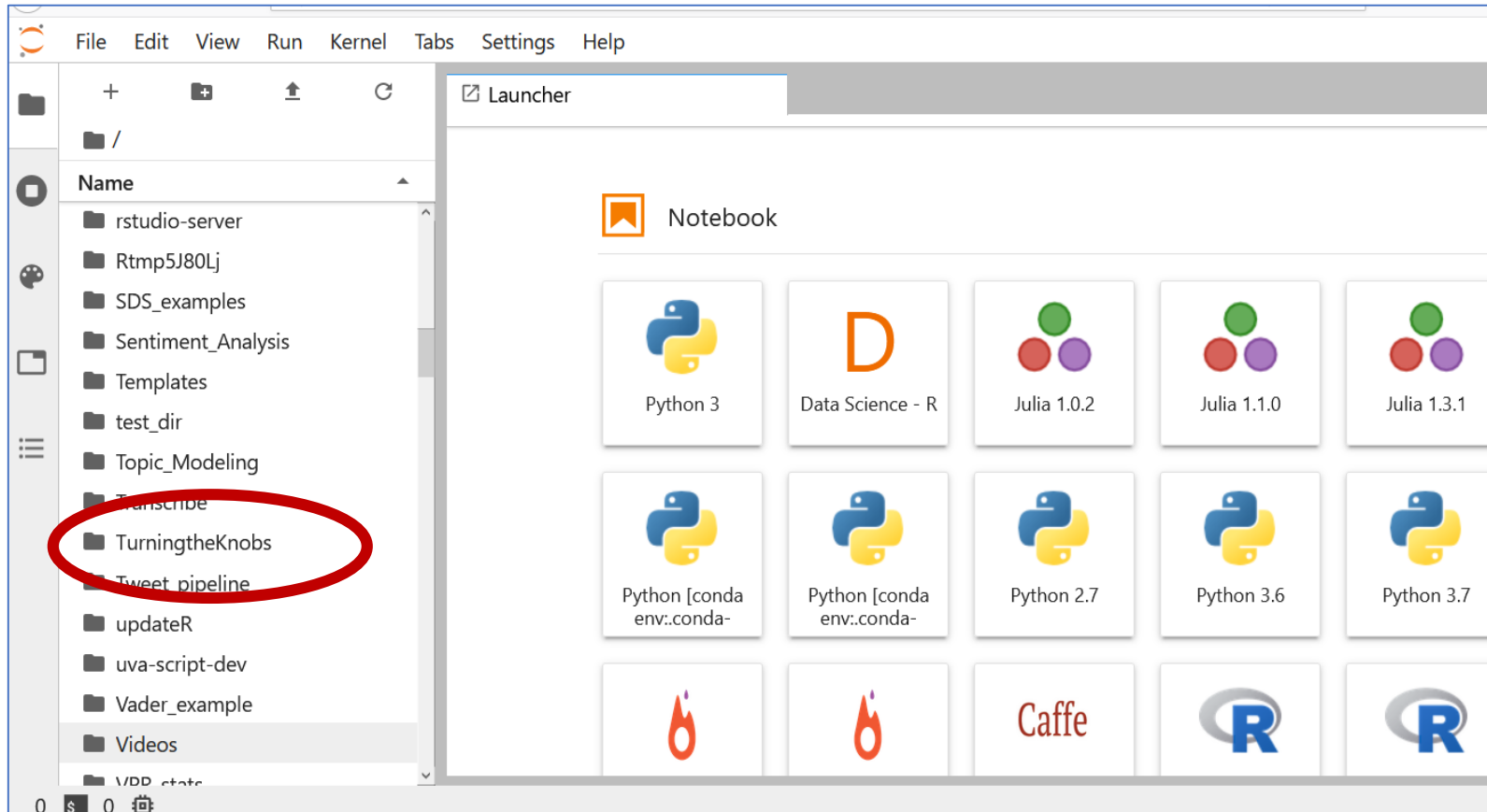




The screen will transition from a “Please be patient” statement to a “Connect to Jupyter” button.

Click on the “Connect to Jupyter” button.

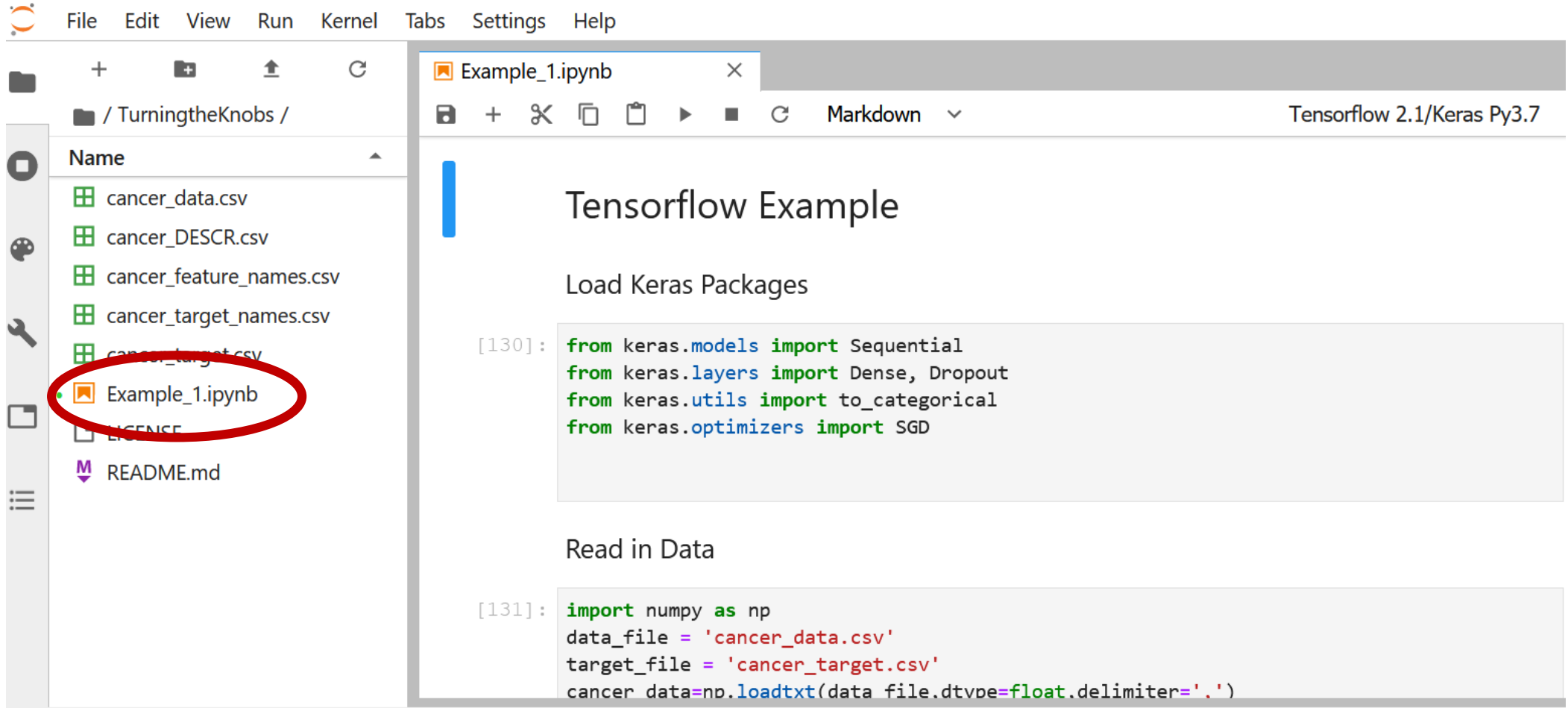
JupyterLab



Use the File Explorer to find the folder “TurningtheKnobs” and double-click on it.

Then, double-click on the notebook file (e.g., Example_1.ipynb) to open it.

Viewing the Notebook



File Edit View Run Kernel Tabs Settings Help

/ TurningtheKnobs /

Name

- cancer_data.csv
- cancer_DESCR.csv
- cancer_feature_names.csv
- cancer_target_names.csv
- cancer_target.csv
- Example_1.ipynb**
- LICENSE
- README.md

Example_1.ipynb

Tensorflow 2.1/Keras Py3.7

Tensorflow Example

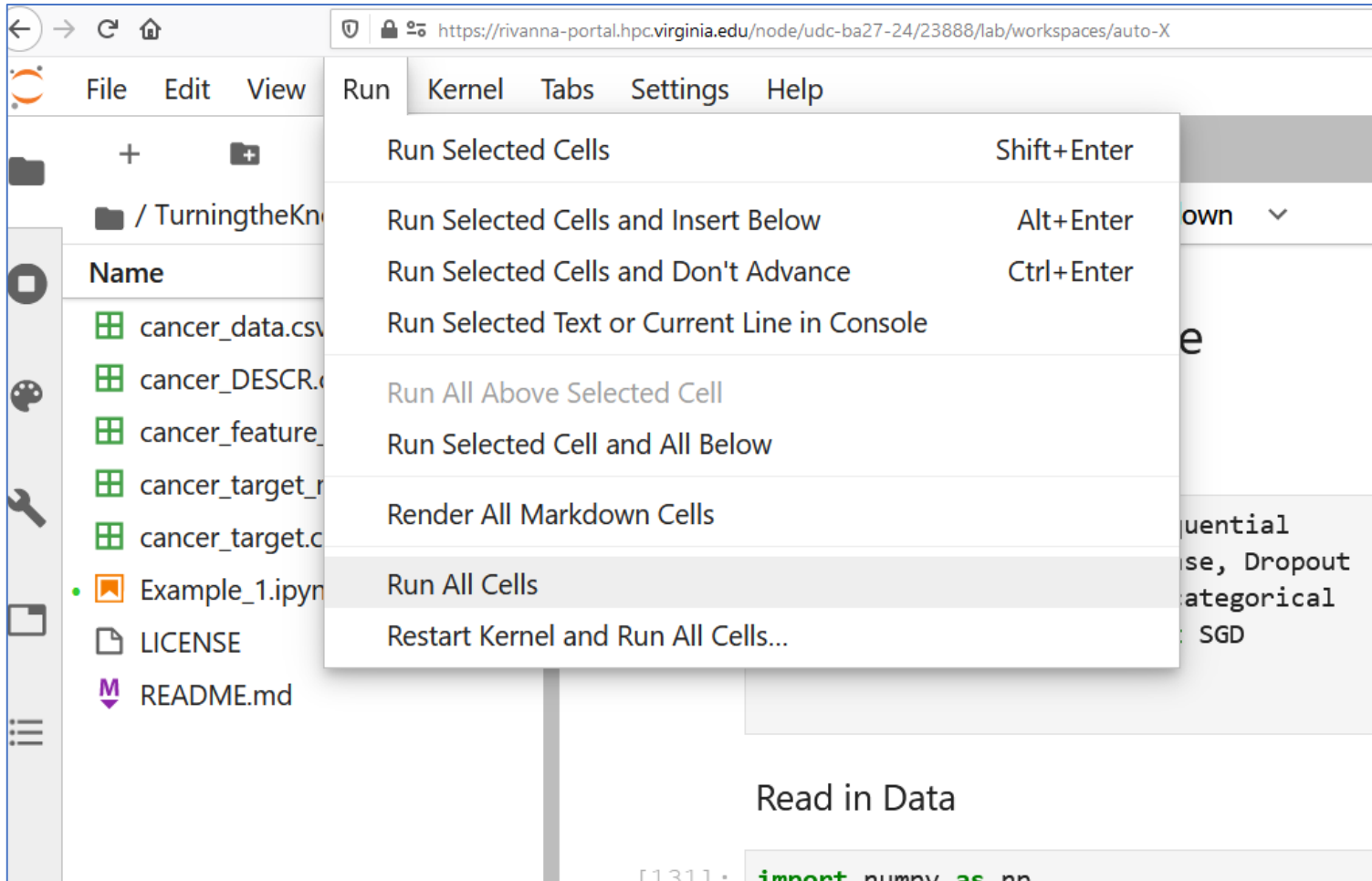
Load Keras Packages

```
[130]: from keras.models import Sequential
from keras.layers import Dense, Dropout
from keras.utils import to_categorical
from keras.optimizers import SGD
```

Read in Data

```
[131]: import numpy as np
data_file = 'cancer_data.csv'
target_file = 'cancer_target.csv'
cancer_data=np.loadtxt(data_file,dtype=float,delimiter=',')
```

Running the Notebook



To run the Notebook, select *Run > Run All Cells*.

You will need to scroll through the Notebook to see all of the results.

Ending the Session


JupyterLab (12492035) 1 node | 1 core | Running

Host: >_udc-ba25-23 Delete

Created at: 2020-05-29 00:18:04 EDT

Time Remaining: 2 hours and 59 minutes

Session ID: 5763459f-60b3-4af3-a4f4-379d56a61354

 [Connect to Jupyter](#)

When you are done with your Notebook, go back to the tab labeled “My Interactive Sessions” and click on the Delete button.

In the dialogue box that appears, click on the “Confirm” button.

Questions?

Questions about Rivanna or running
JupyterLab sessions can be sent to
hpc-support@virginia.edu

