Title: Numerical Methods Lecture - 230110

Speakers: Erik Schnetter

Collection: Numerical Methods (2022/2023)

Date: January 10, 2023 - 9:15 AM

URL: https://pirsa.org/23010002

PSI Numerical Methods 2023

Dustin Lang & Erik Schnetter

https://docs.google.com/presentation/d/1BnCMc3bvfCHI8kWTf4dQ1zt0WEQSLT0YPNuS499cDzw/edit?usp=sharing

Outline for this week (and today)

- Today: 2 x 90-minute sessions (Dustin) - intro to Symmetry, Jupyterhub, & Git
- Wed, Thu, Mon: 3 x 90-minute sessions (Erik) - intro to Julia

Today:

- getting set up on Symmetry
- using Julia on Jupyterhub
- using Git and Github for version control and collaboration

Additional resources

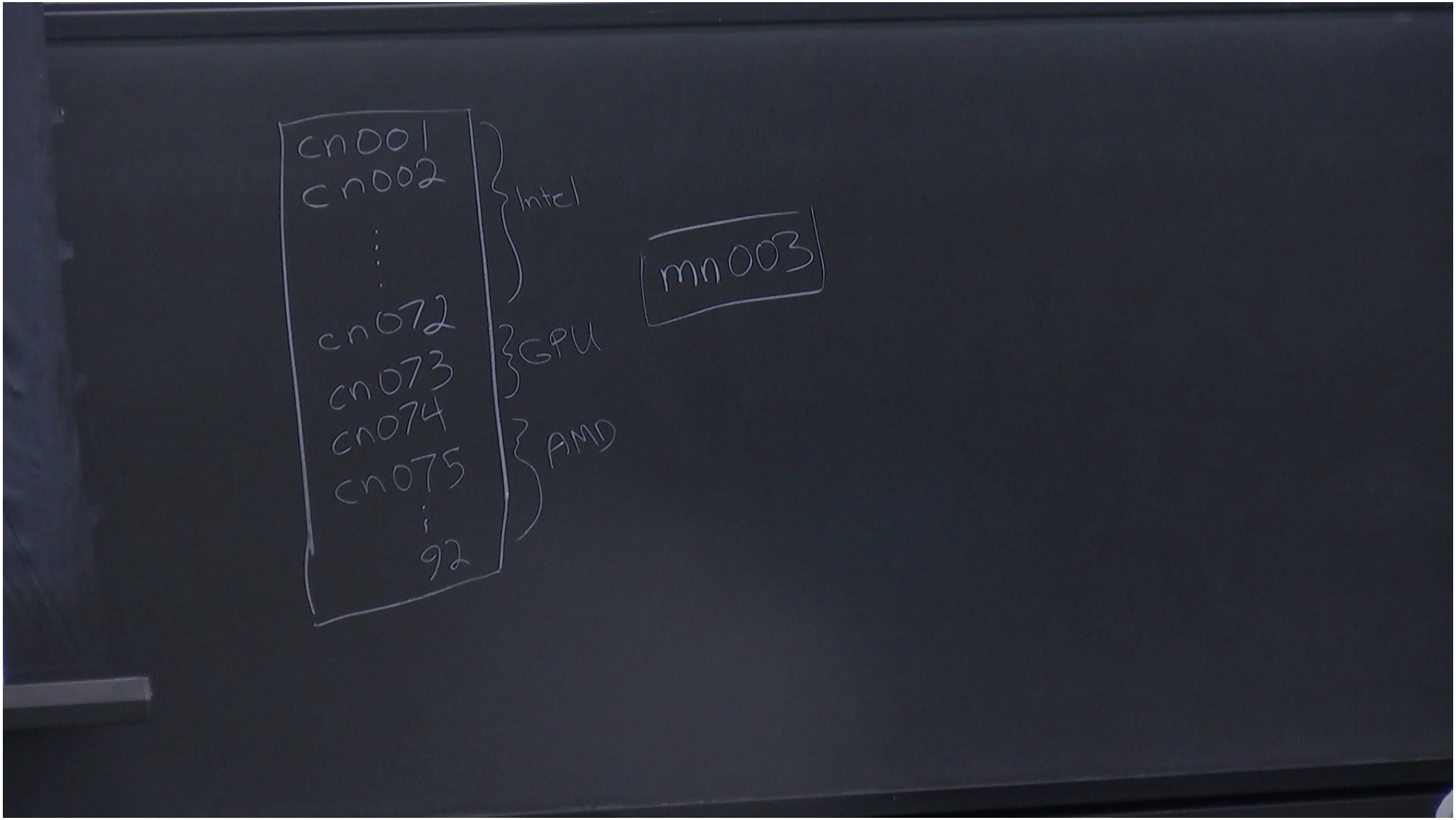
The “Carpentries” organization has some really good lessons on computing topics for scientists:

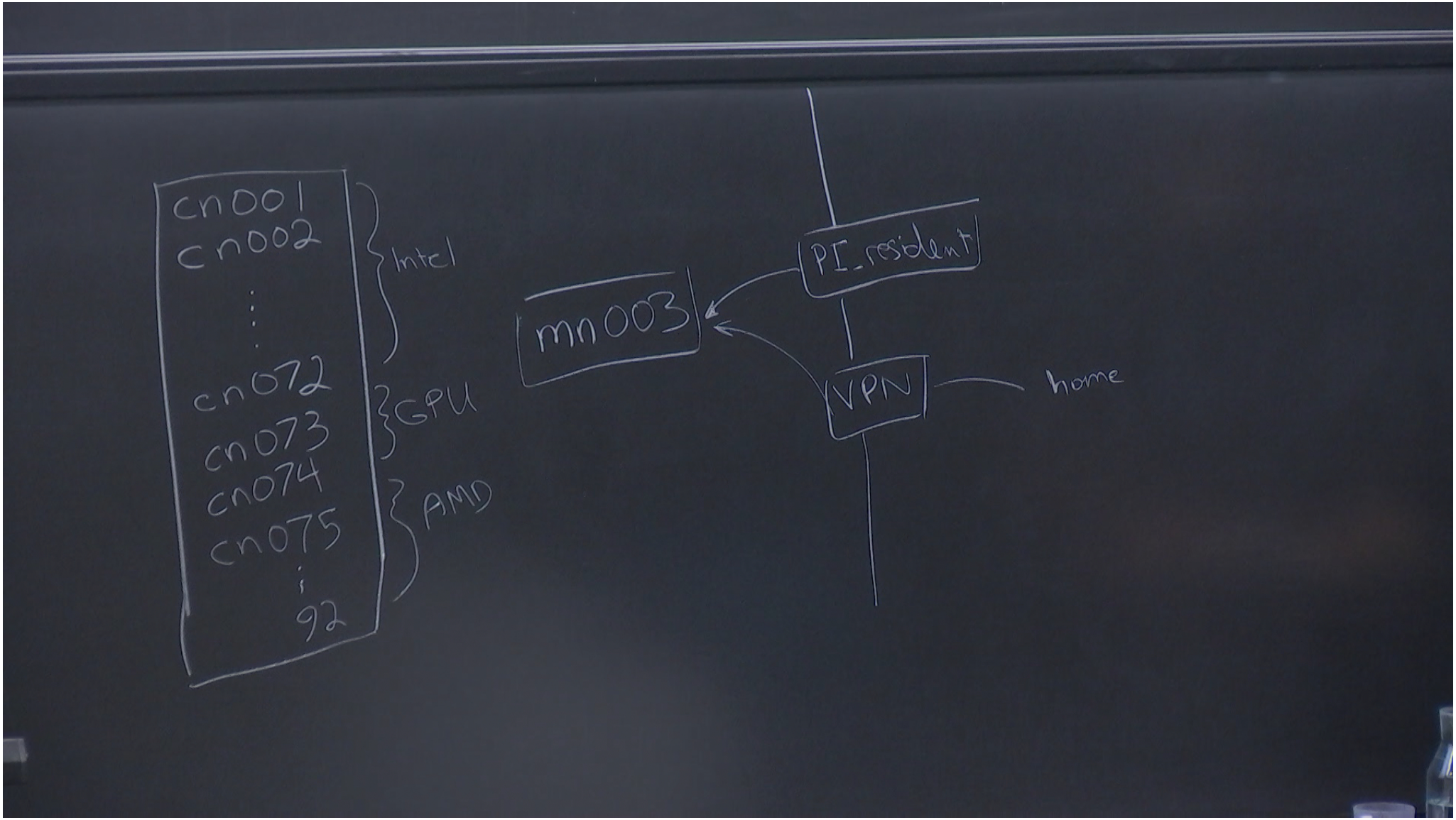
- Unix Shell (bash)
- Version control with Git
- Julia
- Good-enough computing practices for scientists
- High-performance computing
- Docker containers

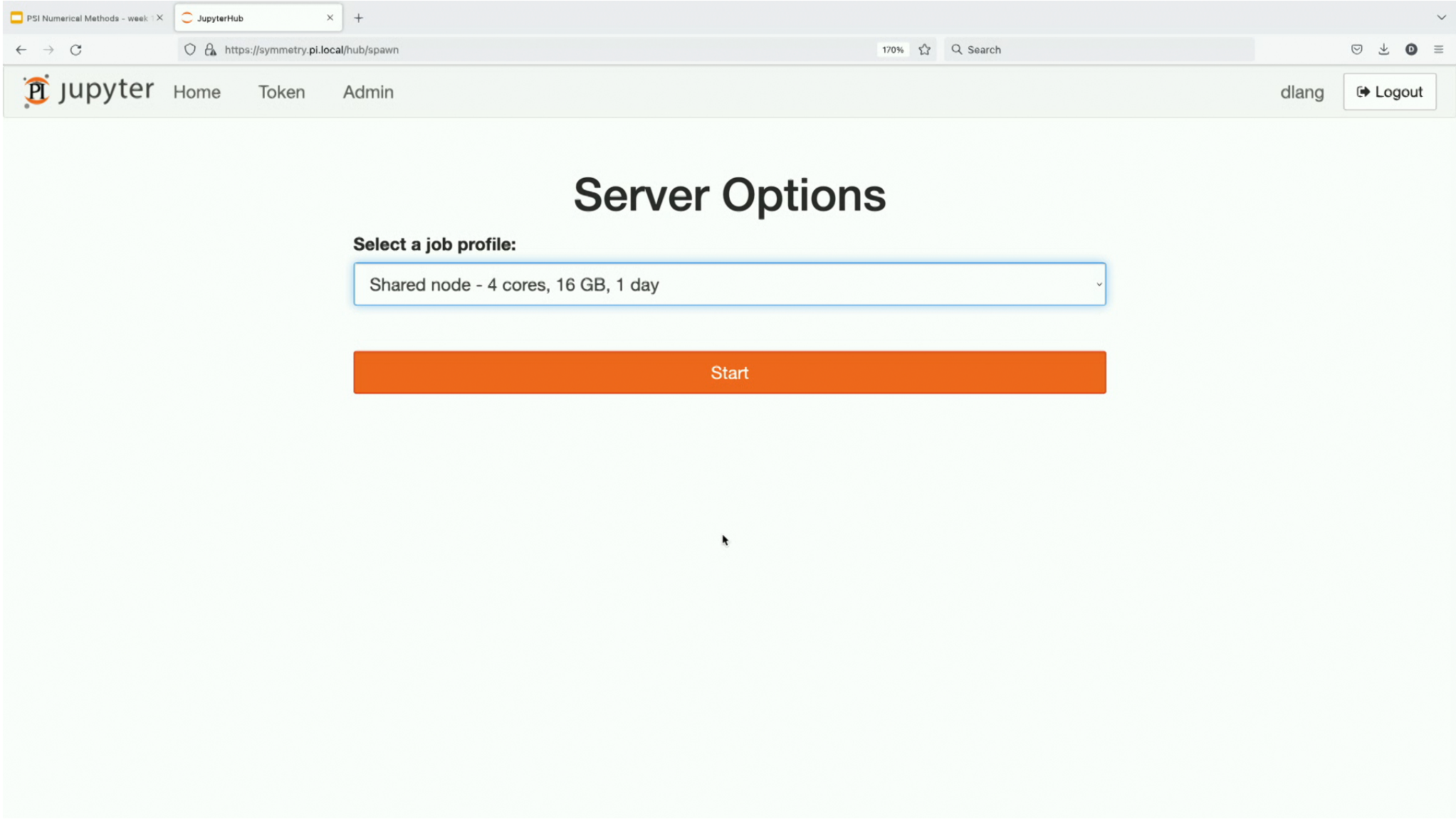
What is the Symmetry high-performance computer?

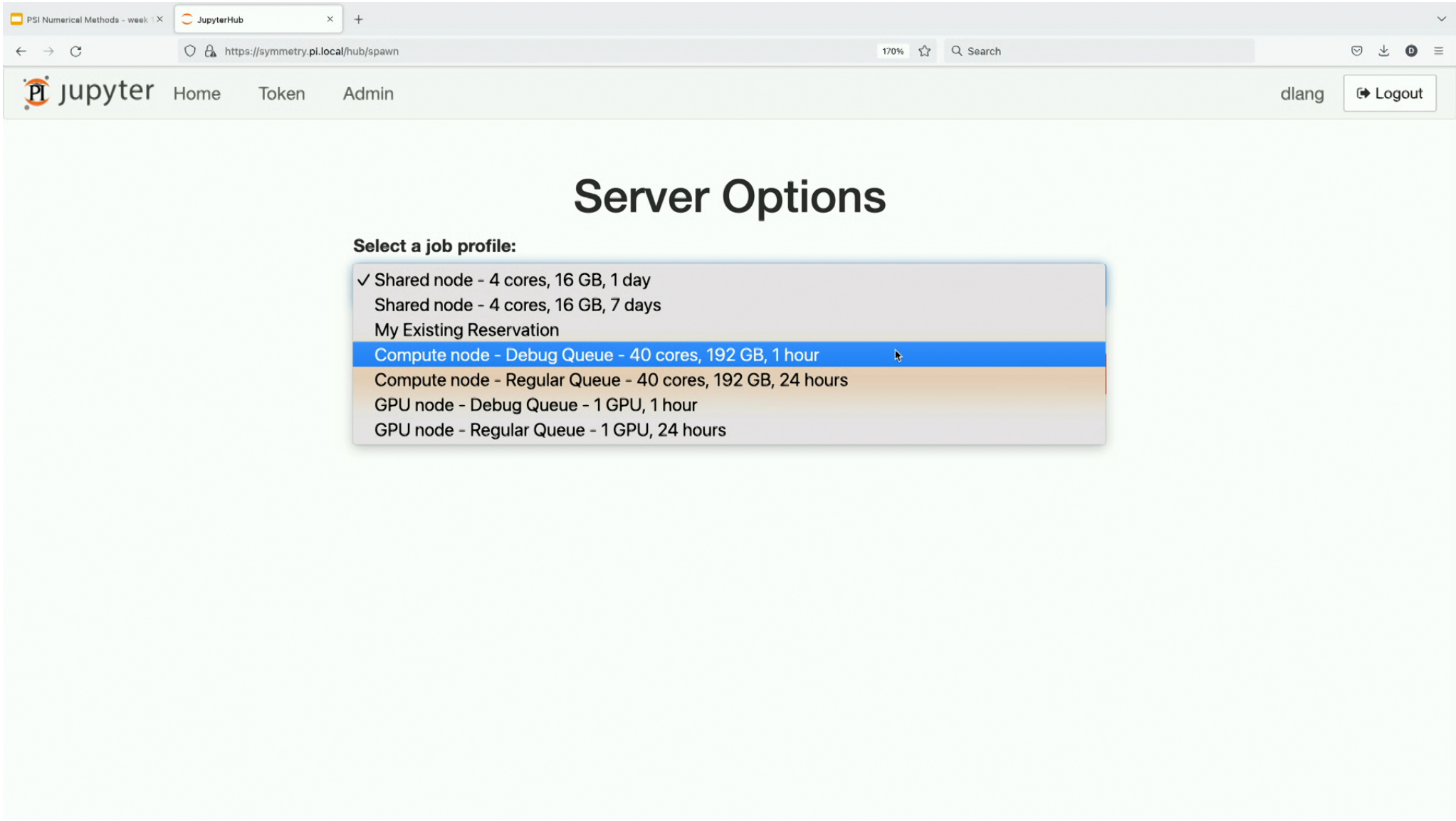
- available from inside the PI network – either PI_Resident wifi, or PI VPN
- about 100 powerful compute nodes (~ 40-64 cores, 200-256 GB of memory)
- *Slurm* queue/scheduler lets you run “batch” compute jobs
- for this course, we’ll use the Jupyterhub server at https://symmetry.pi.local
- there’s also a remote-desktop system (eg for *Mathematica*)
- more information about Symmetry is on PION

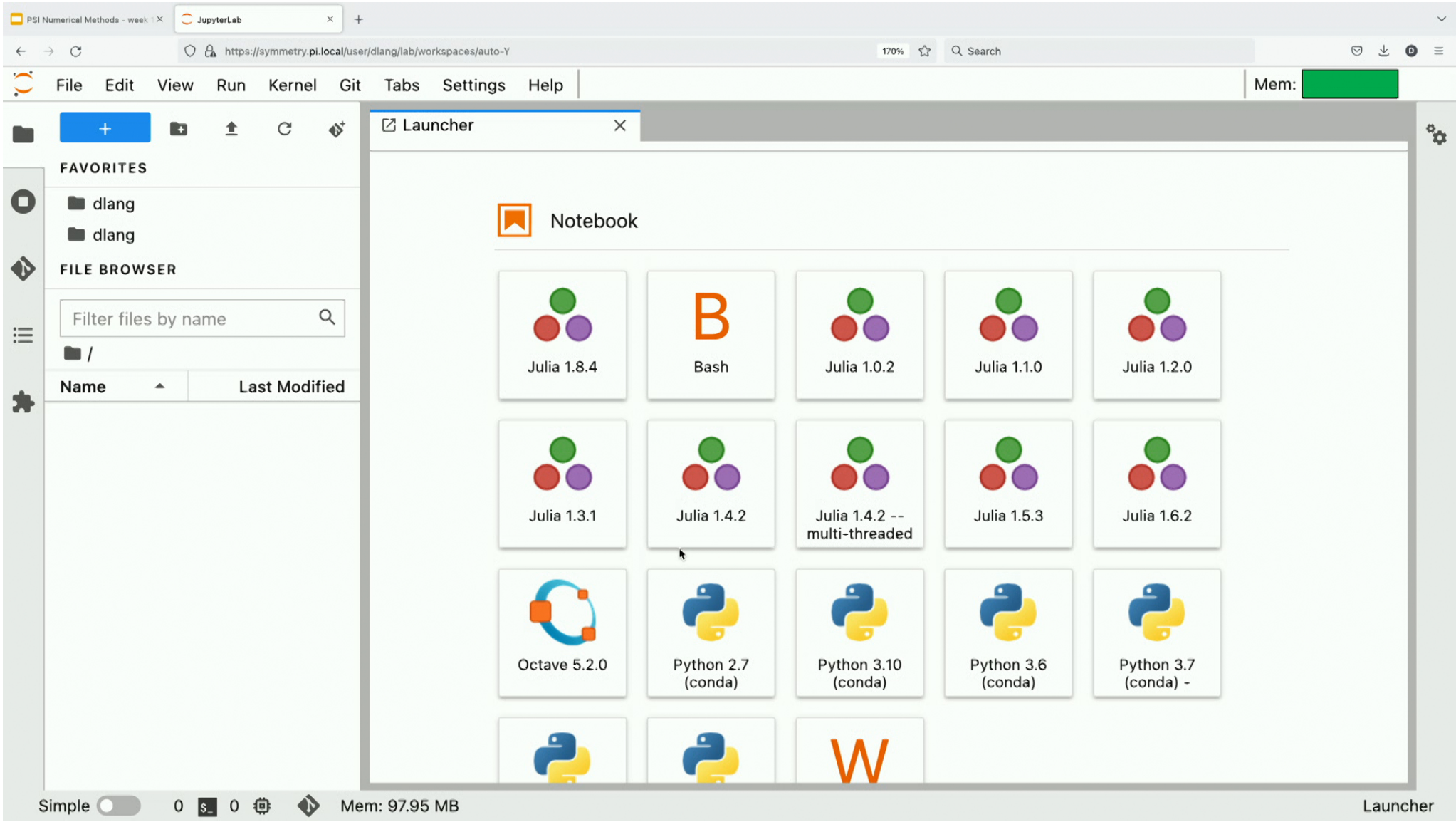



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Intel
GPU
AMD
mn003


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92
Intel
GPU
AMD
mn003
PI_resident
VPN
home


PSI Numerical Methods - week
JupyterHub
https://symmetry.pi.local/hub/spawn
170%
Search
jupyter
Home
Token
Admin
dlang
Logout
Server Options
Select a job profile:
Shared node - 4 cores, 16 GB, 1 day
Start

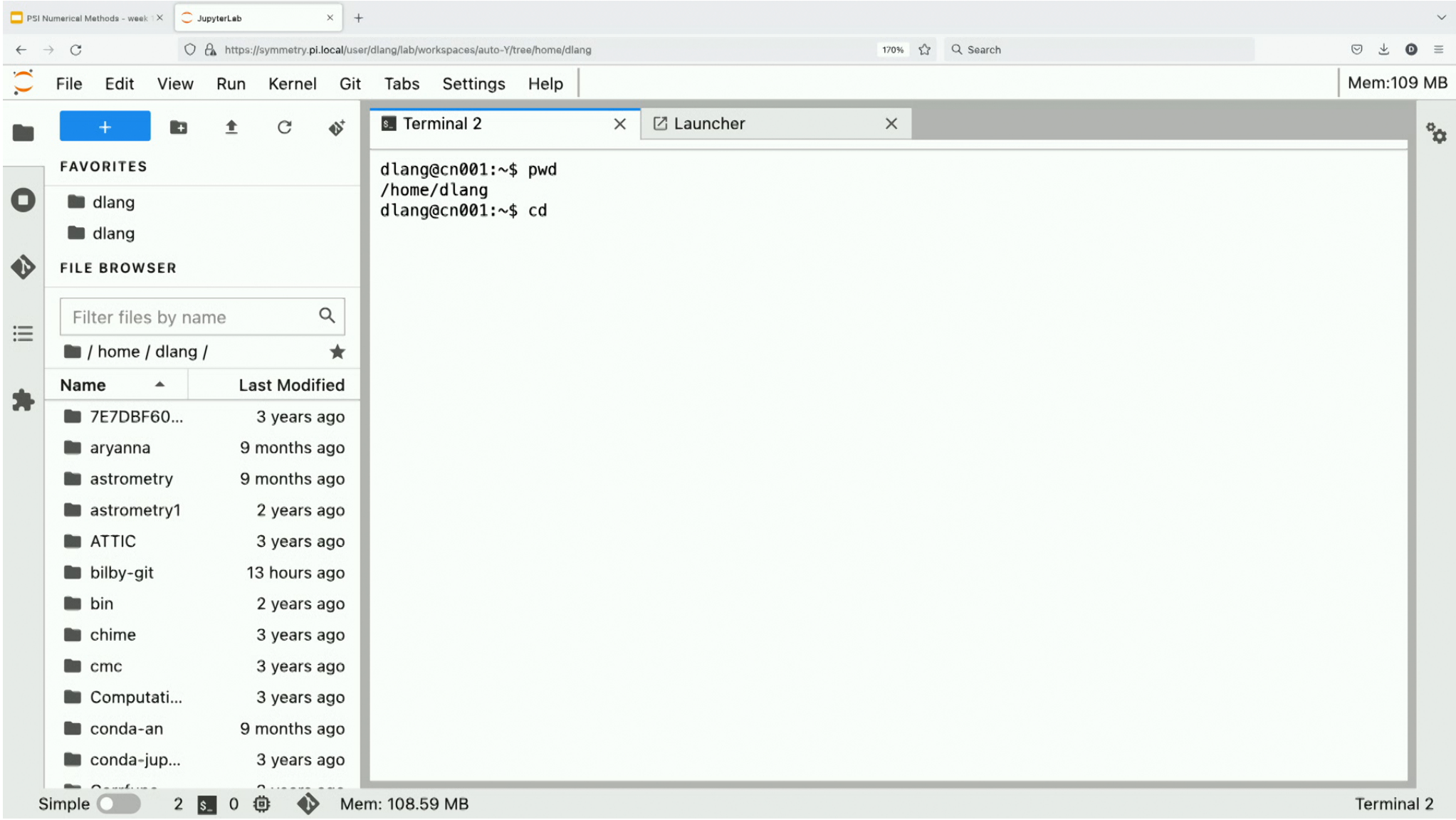

PSI Numerical Methods - week
JupyterHub
https://symmetry.pi.local/hub/spawn
170%
Search
jupyter
Home
Token
Admin
dlang
Logout
Server Options
Select a job profile:
✓ Shared node - 4 cores, 16 GB, 1 day
Shared node - 4 cores, 16 GB, 7 days
My Existing Reservation
Compute node - Debug Queue - 40 cores, 192 GB, 1 hour
Compute node - Regular Queue - 40 cores, 192 GB, 24 hours
GPU node - Debug Queue - 1 GPU, 1 hour
GPU node - Regular Queue - 1 GPU, 24 hours

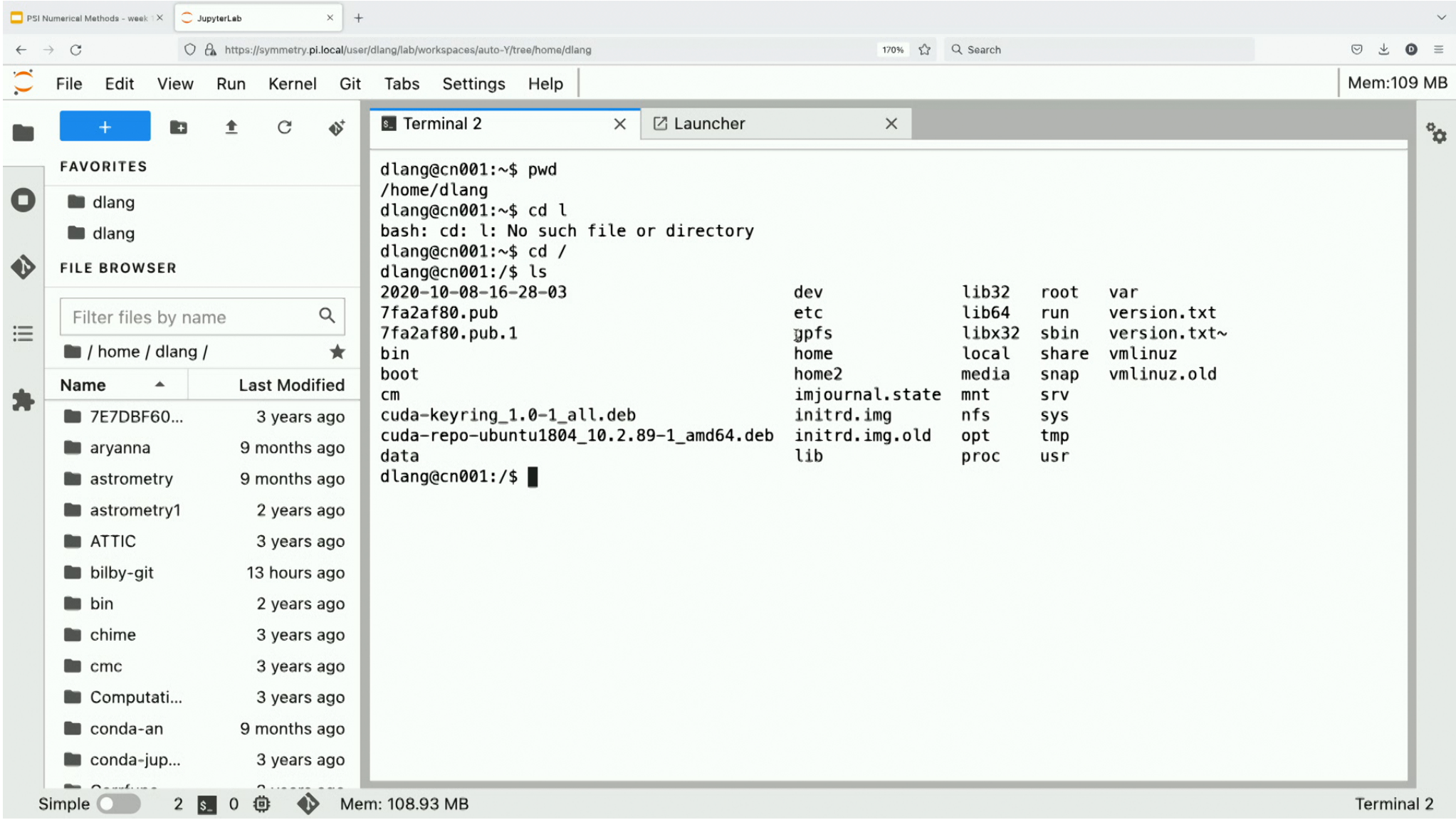

PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y
170%
Search
File
Edit
View
Run
Kernel
Git
Tabs
Settings
Help
Mem:
Launcher
FAVORITES
dlang
dlang
FILE BROWSER
Filter files by name
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Name
Last Modified
Notebook
Julia 1.8.4
Bash
Julia 1.0.2
Julia 1.1.0
Julia 1.2.0
Julia 1.3.1
Julia 1.4.2
Julia 1.4.2 -- multi-threaded
Julia 1.5.3
Julia 1.6.2
Octave 5.2.0
Python 2.7 (conda)
Python 3.10 (conda)
Python 3.6 (conda)
Python 3.7 (conda) -
Simple
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Mem: 97.95 MB
Launcher

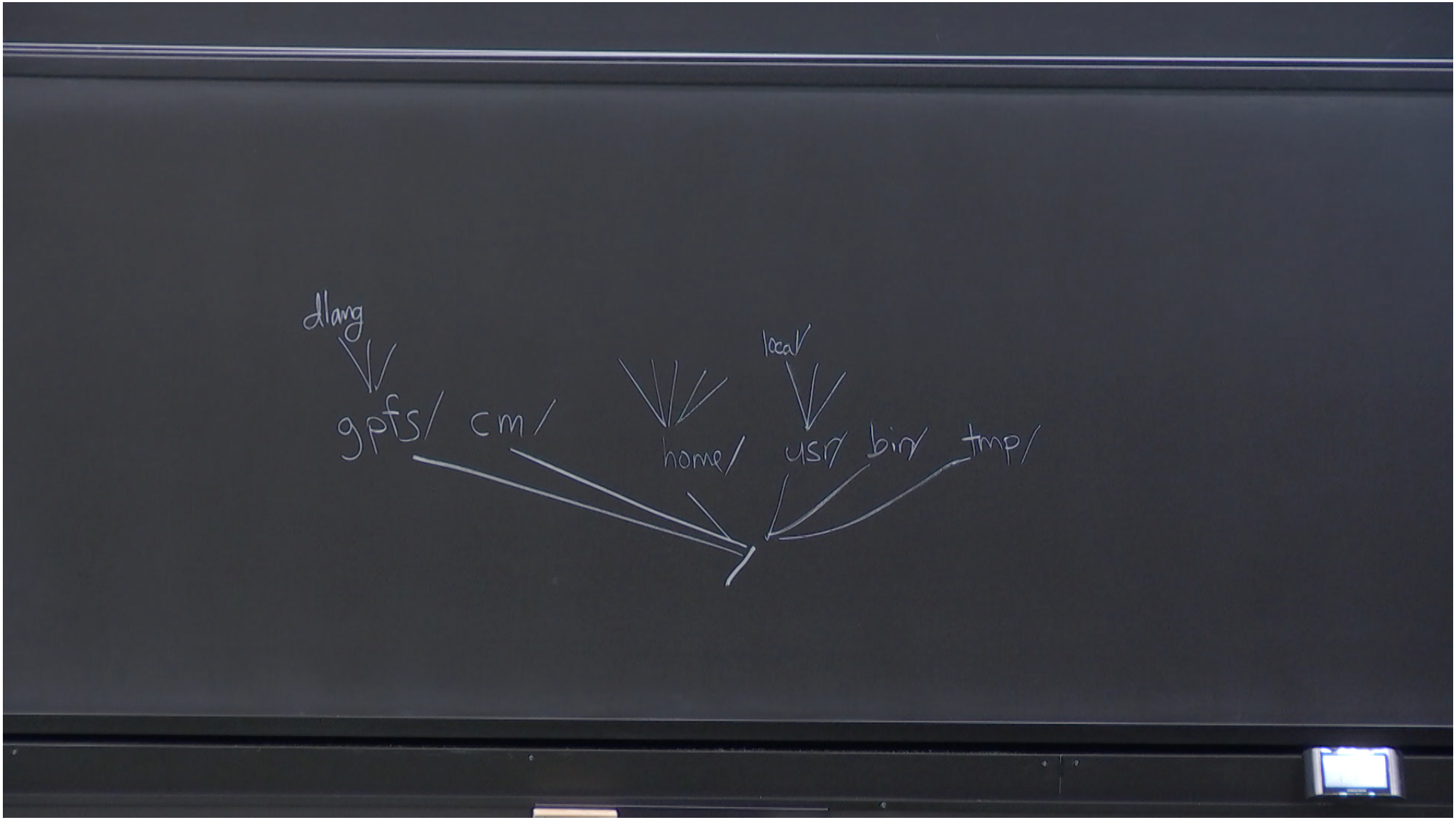
PSI Numerical Methods - week 1

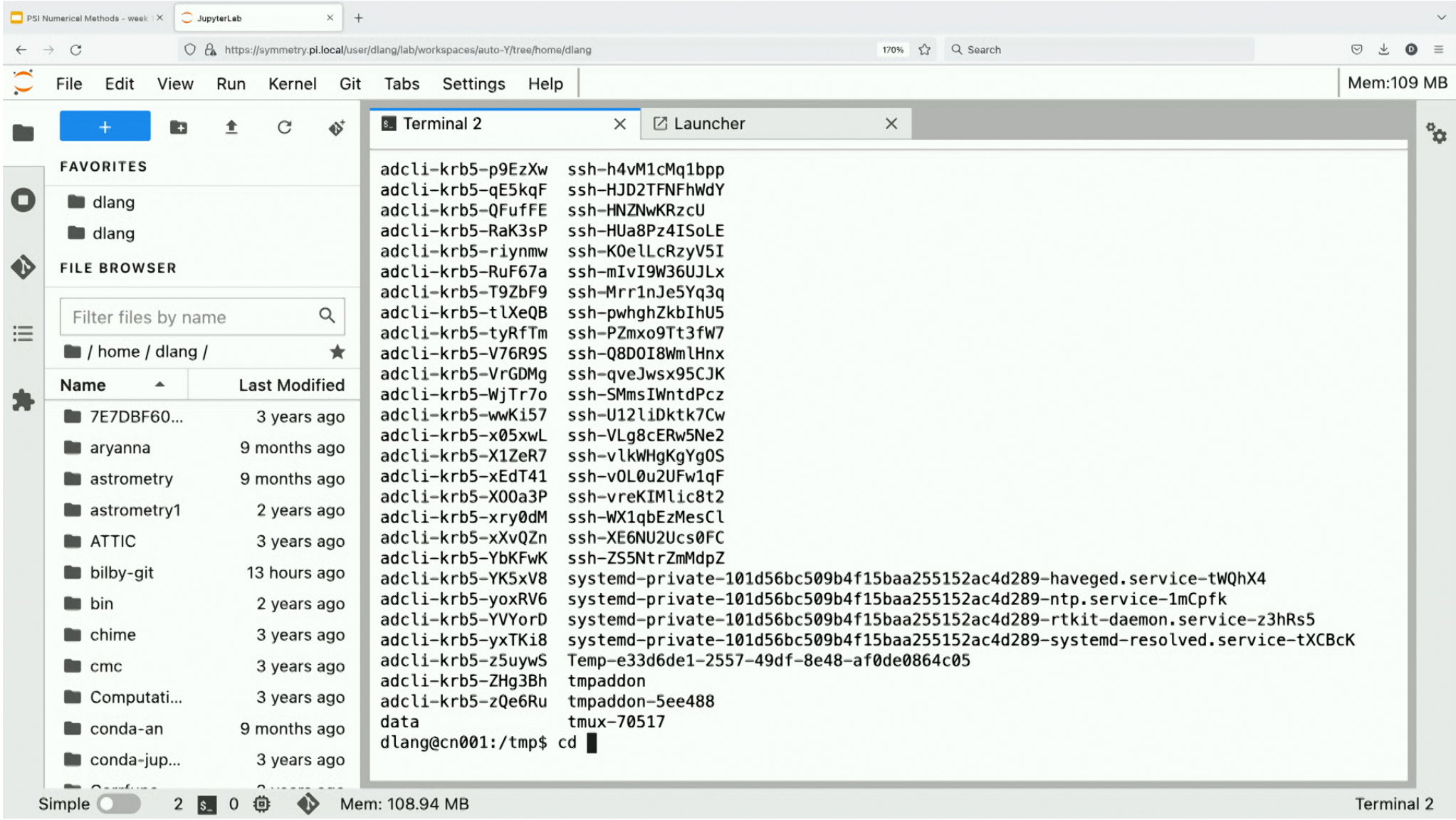
Setting up the Julia notebook kernel on Symmetry

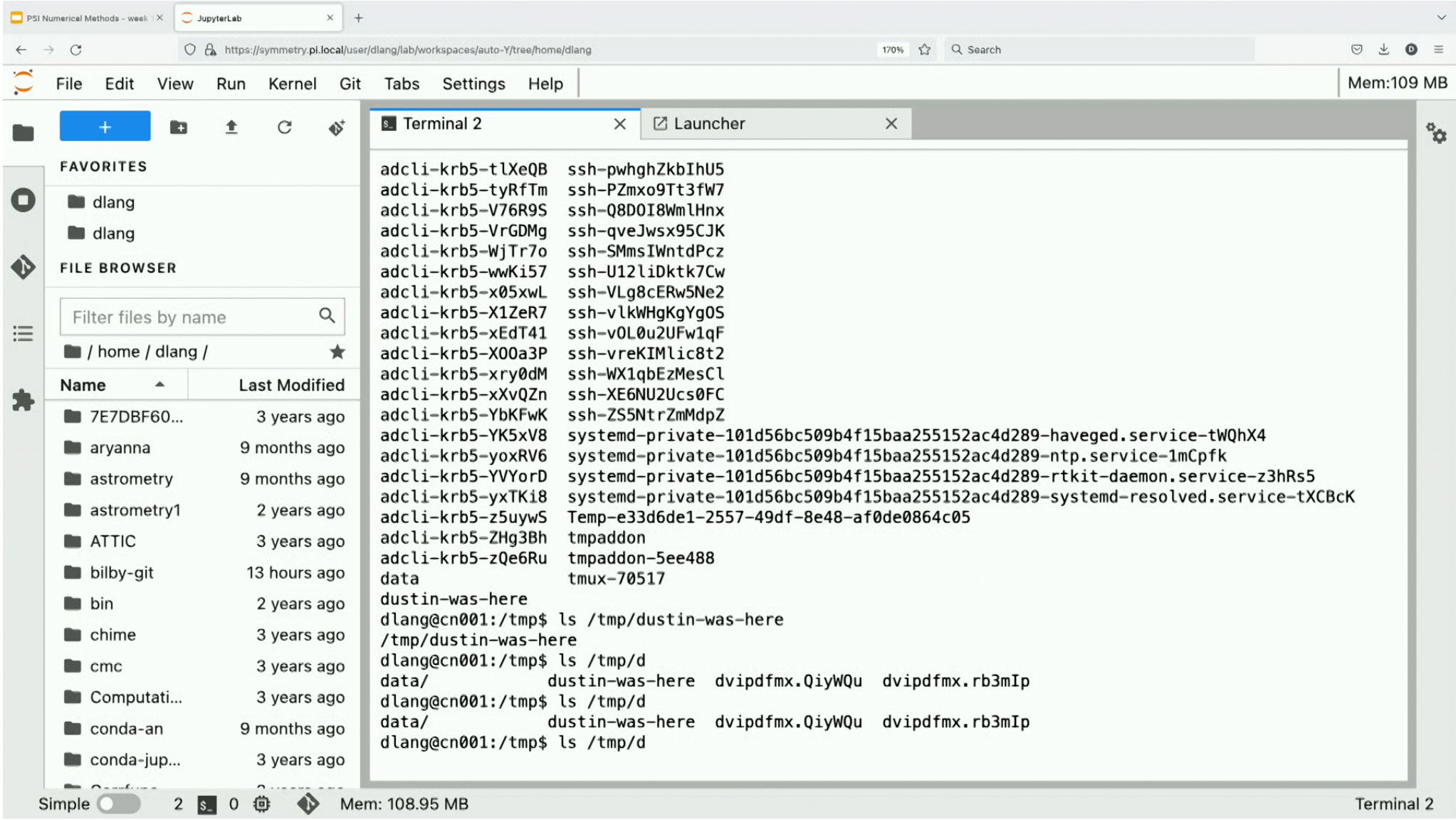
- In Jupyterhub, start a new Terminal notebook
- `> module load julia`
- `> julia`
- `using Pkg`
- `Pkg.add("IJulia")`

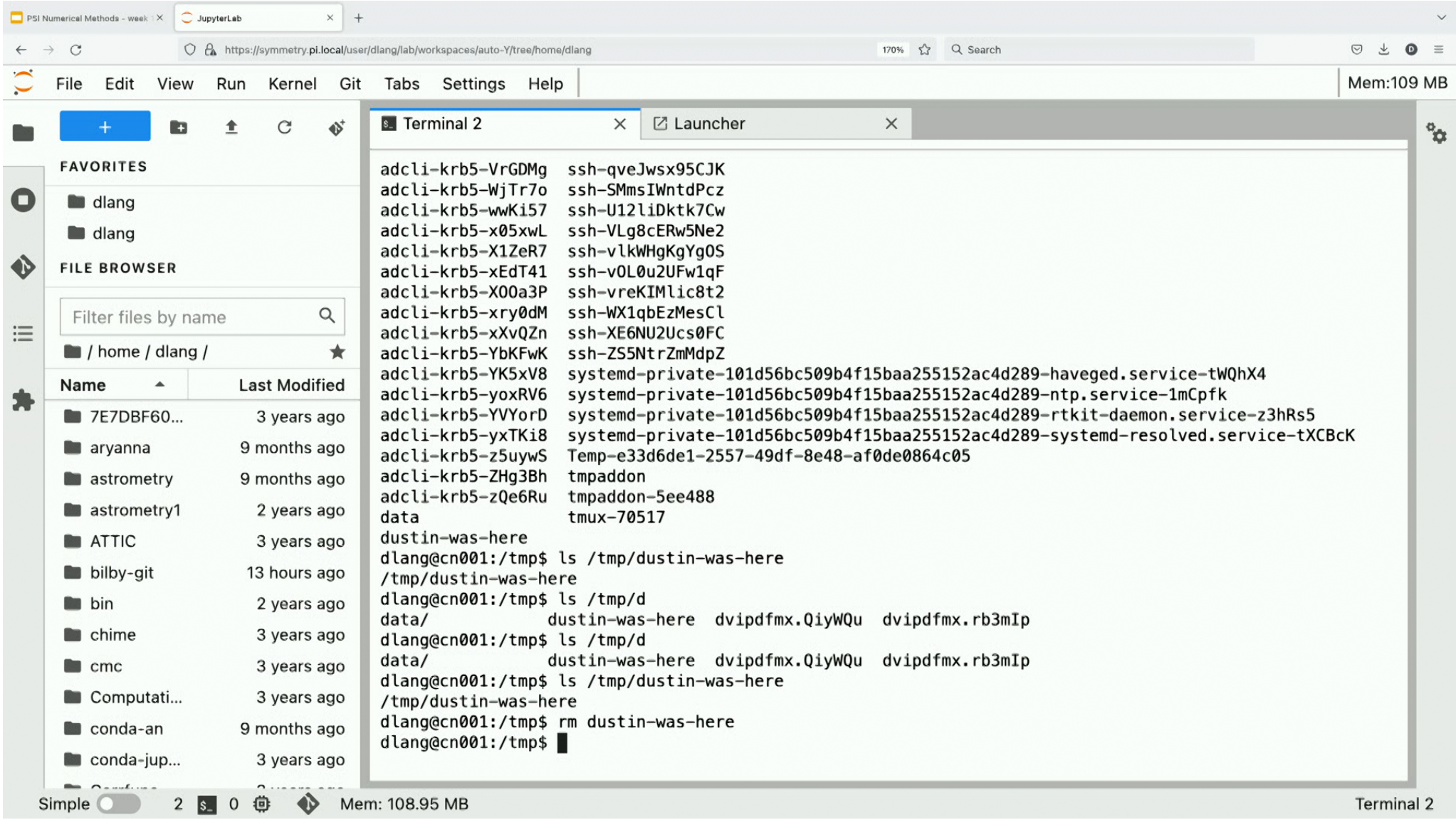

PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
dlang
dlang
FILE BROWSER
Filter files by name
/ home / dlang /
Name
Last Modified
7E7DBF60... 3 years ago
aryanna 9 months ago
astrometry 9 months ago
astrometry1 2 years ago
ATTIC 3 years ago
bilby-git 13 hours ago
bin 2 years ago
chime 3 years ago
cmc 3 years ago
Computati... 3 years ago
conda-an 9 months ago
conda-jup... 3 years ago
Terminal 2
Launcher
dlang@cn001:~$ pwd
/home/dlang
dlang@cn001:~$ cd
Simple
2
0
Mem: 108.59 MB
Terminal 2

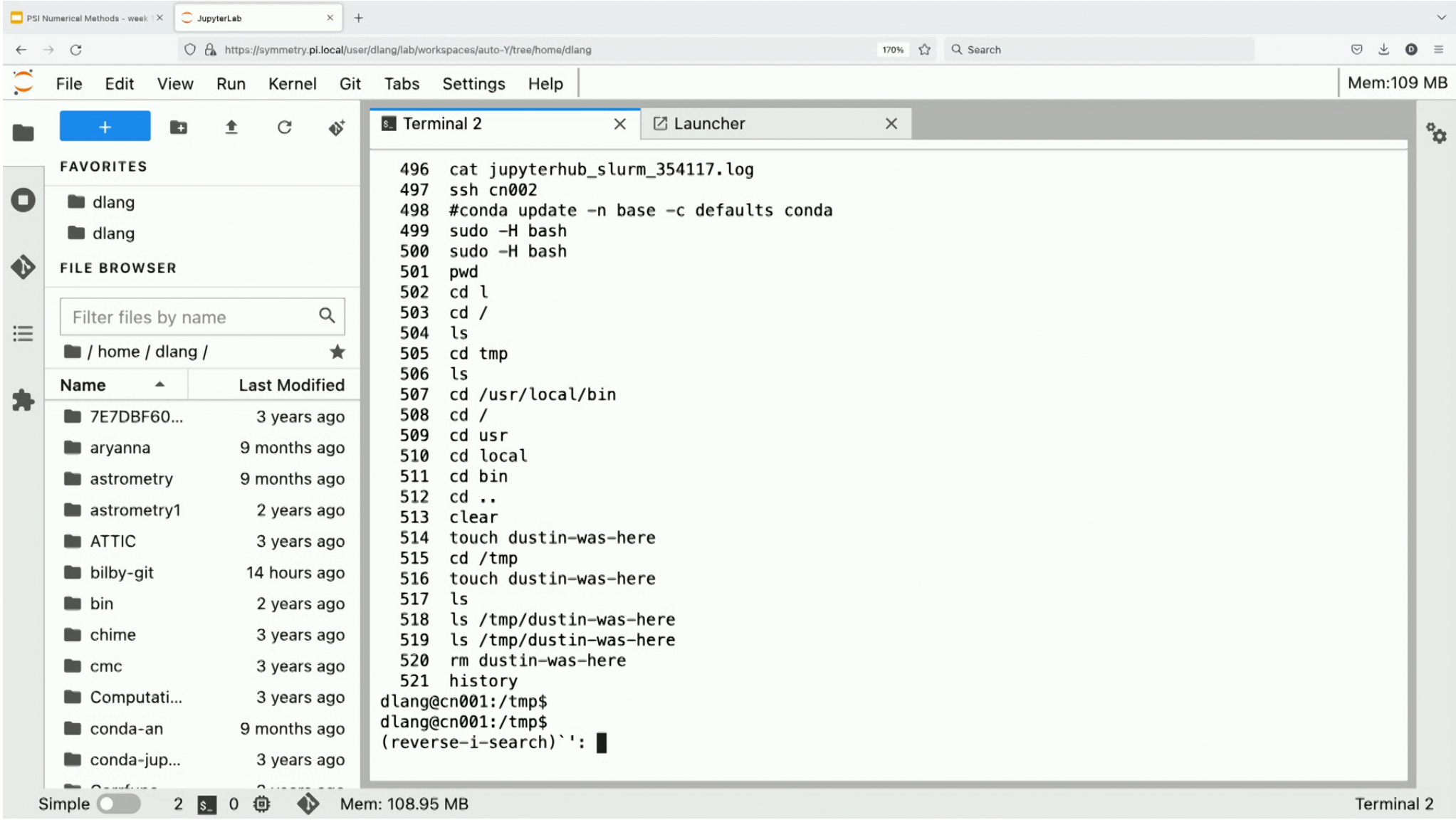

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https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
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chime 3 years ago
cmc 3 years ago
Computati... 3 years ago
conda-an 9 months ago
conda-jup... 3 years ago
Terminal 2
Launcher
dlang@cn001:~$ pwd
/home/dlang
dlang@cn001:~$ cd l
bash: cd: l: No such file or directory
dlang@cn001:~$ cd /
dlang@cn001:/$ ls
2020-10-08-16-28-03
7fa2af80.pub
7fa2af80.pub.1
bin
boot
cm
cuda-keyring_1.0-1_all.deb
cuda-repo-ubuntu1804_10.2.89-1_amd64.deb
data
dev
etc
gpfs
home
home2
imjournal.state
initrd.img
initrd.img.old
lib
lib32
lib64
libx32
local
media
mnt
nfs
opt
proc
root
run
sbin
share
snap
srv
sys
tmp
usr
var
version.txt
version.txt~
vmlinuz
vmlinuz.old
dlang@cn001:/$
Simple
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Mem: 108.93 MB
Terminal 2

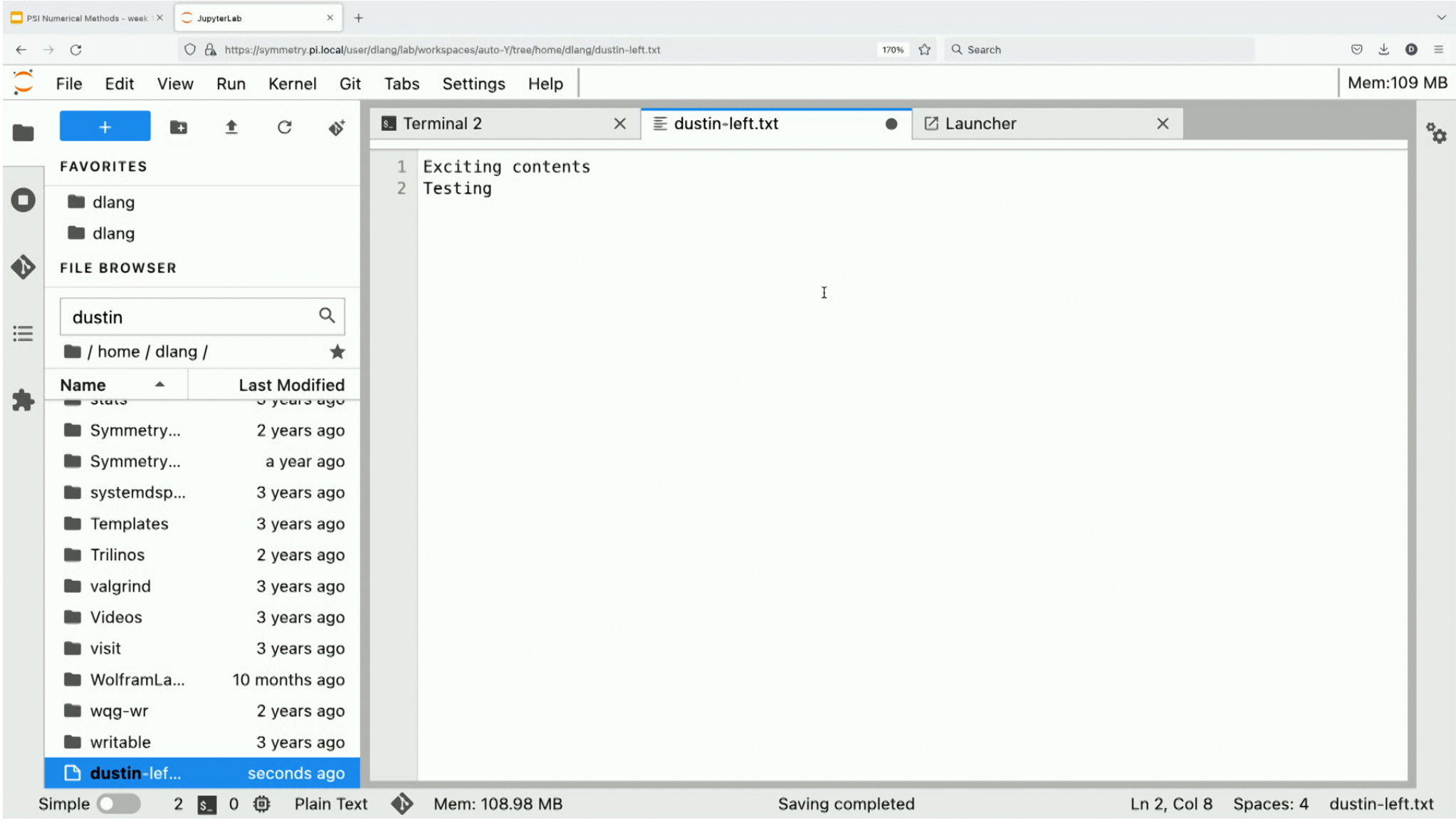

dlang
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cm/
home/
local/
usr/
bin/
tmp/

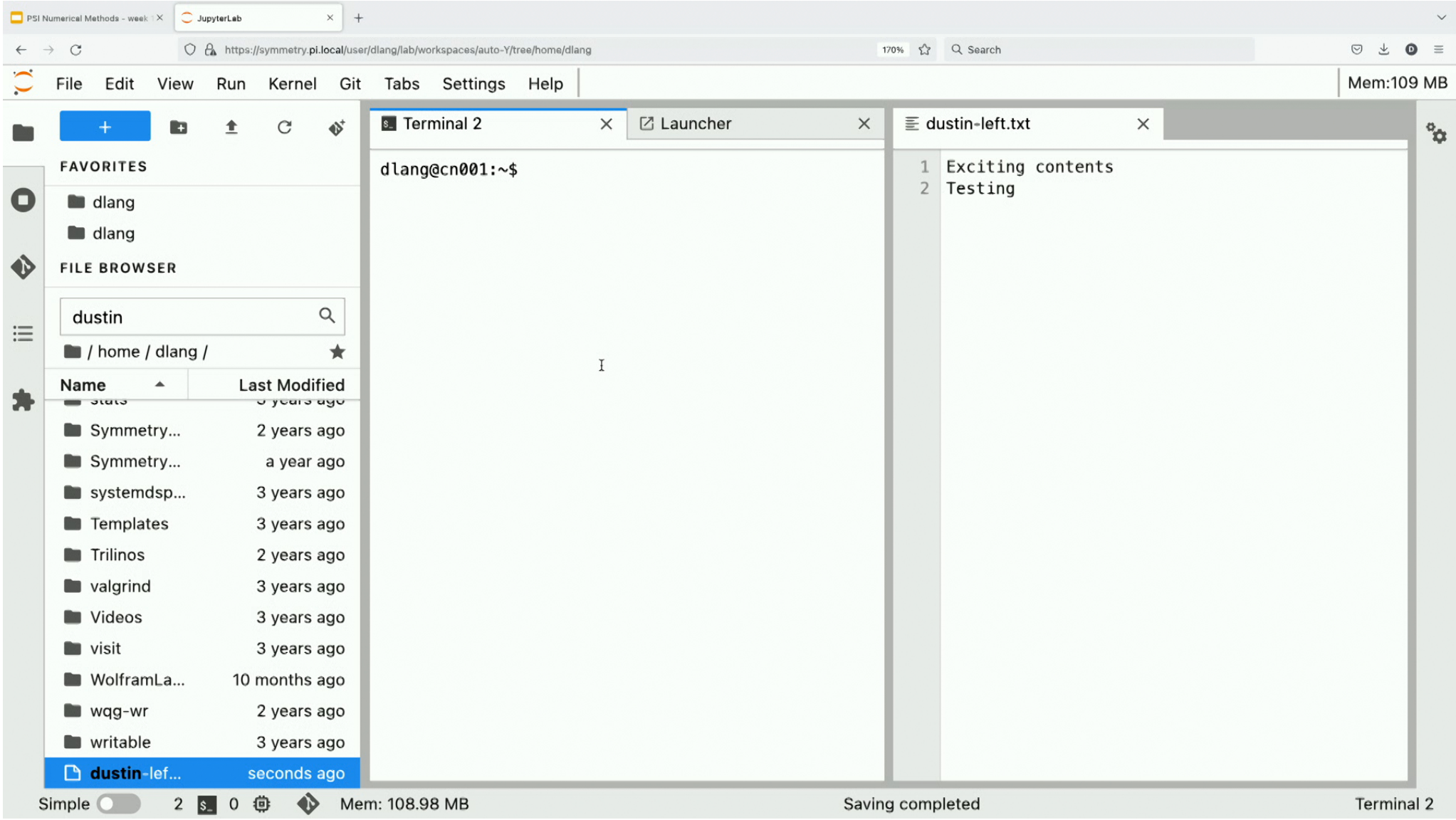

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cmc 3 years ago
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conda-an 9 months ago
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Terminal 2
Launcher
adcli-krb5-p9EzXw ssh-h4vM1cMq1bpp
adcli-krb5-qE5kqF ssh-HJD2TFNFhWdY
adcli-krb5-QFufFE ssh-HNZNwKRzcU
adcli-krb5-RaK3sP ssh-HUa8Pz4ISoLE
adcli-krb5-riynmw ssh-KOelLcRzyV5I
adcli-krb5-RuF67a ssh-mIvI9W36UJLx
adcli-krb5-T9ZbF9 ssh-Mrr1nJe5Yq3q
adcli-krb5-tlXeQB ssh-pwhghZkbIhU5
adcli-krb5-tyRfTm ssh-PZmxo9Tt3fW7
adcli-krb5-V76R9S ssh-Q8DOI8WmlHnx
adcli-krb5-VrGDMg ssh-qveJwsx95CJK
adcli-krb5-WjTr7o ssh-SMmsIWntdPcz
adcli-krb5-wwKi57 ssh-U12liDktk7Cw
adcli-krb5-x05xwL ssh-VLg8cERw5Ne2
adcli-krb5-X1ZeR7 ssh-vlkWHgKgYgOS
adcli-krb5-xEdT41 ssh-vOL0u2UFw1qF
adcli-krb5-XOOa3P ssh-vreKIMlic8t2
adcli-krb5-xry0dM ssh-WX1qbEzMesCl
adcli-krb5-xXvQZn ssh-XE6NU2Ucs0FC
adcli-krb5-YbKFwK ssh-ZS5NtrZmMdpZ
adcli-krb5-YK5xV8 systemd-private-101d56bc509b4f15baa255152ac4d289-haveged.service-tWQhX4
adcli-krb5-yoxRV6 systemd-private-101d56bc509b4f15baa255152ac4d289-ntp.service-1mCpfk
adcli-krb5-YVYorD systemd-private-101d56bc509b4f15baa255152ac4d289-rtkit-daemon.service-z3hRs5
adcli-krb5-yxTKi8 systemd-private-101d56bc509b4f15baa255152ac4d289-systemd-resolved.service-tXCBcK
adcli-krb5-z5uywS Temp-e33d6de1-2557-49df-8e48-af0de0864c05
adcli-krb5-ZHg3Bh tmpaddon
adcli-krb5-zQe6Ru tmpaddon-5ee488
data tmux-70517
dlang@cn001:/tmp$ cd
Simple
2
0
Mem: 108.94 MB
Terminal 2

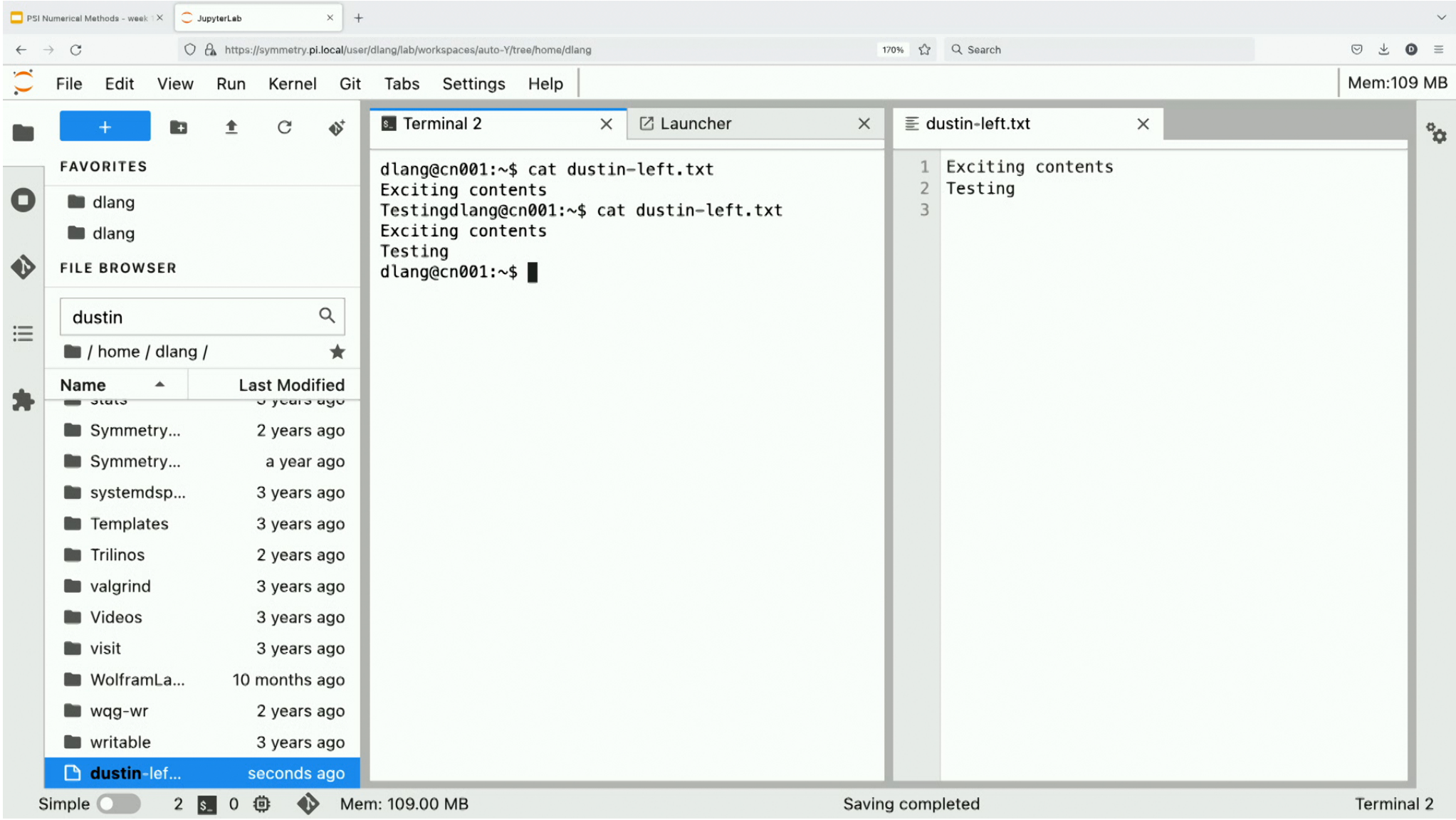

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JupyterLab
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astrometry1 2 years ago
ATTIC 3 years ago
bilby-git 13 hours ago
bin 2 years ago
chime 3 years ago
cmc 3 years ago
Computati... 3 years ago
conda-an 9 months ago
conda-jup... 3 years ago
Terminal 2
Launcher
adcli-krb5-tlXeQB ssh-pwhghZkbIhU5
adcli-krb5-tyRfTm ssh-PZmxo9Tt3fW7
adcli-krb5-V76R9S ssh-Q8DOI8WmlHnx
adcli-krb5-VrGDMg ssh-qveJwsx95CJK
adcli-krb5-WjTr7o ssh-SMmsIWntdPcz
adcli-krb5-wwKi57 ssh-U12liDktk7Cw
adcli-krb5-x05xwL ssh-VLg8cERw5Ne2
adcli-krb5-X1ZeR7 ssh-vlkWHgKgYgOS
adcli-krb5-xEdT41 ssh-vOL0u2UFw1qF
adcli-krb5-XOOa3P ssh-vreKIMlic8t2
adcli-krb5-xry0dM ssh-WX1qbEzMesCl
adcli-krb5-xXvQZn ssh-XE6NU2Ucs0FC
adcli-krb5-YbKFwK ssh-ZS5NtrZmMdpZ
adcli-krb5-YK5xV8 systemd-private-101d56bc509b4f15baa255152ac4d289-haveged.service-tWQhX4
adcli-krb5-yoxRV6 systemd-private-101d56bc509b4f15baa255152ac4d289-ntp.service-1mCpfk
adcli-krb5-YVYorD systemd-private-101d56bc509b4f15baa255152ac4d289-rtkit-daemon.service-z3hRs5
adcli-krb5-yxTKi8 systemd-private-101d56bc509b4f15baa255152ac4d289-systemd-resolved.service-tXCBcK
adcli-krb5-z5uywS Temp-e33d6de1-2557-49df-8e48-af0de0864c05
adcli-krb5-ZHg3Bh tmpaddon
adcli-krb5-zQe6Ru tmpaddon-5ee488
data tmux-70517
dustin-was-here
dlang@cn001:/tmp$ ls /tmp/dustin-was-here
/tmp/dustin-was-here
dlang@cn001:/tmp$ ls /tmp/d
data/ dustin-was-here dvipdfmx.QiyWQu dvipdfmx.rb3mIp
dlang@cn001:/tmp$ ls /tmp/d
data/ dustin-was-here dvipdfmx.QiyWQu dvipdfmx.rb3mIp
dlang@cn001:/tmp$ ls /tmp/d
Simple
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Mem: 108.95 MB
Terminal 2

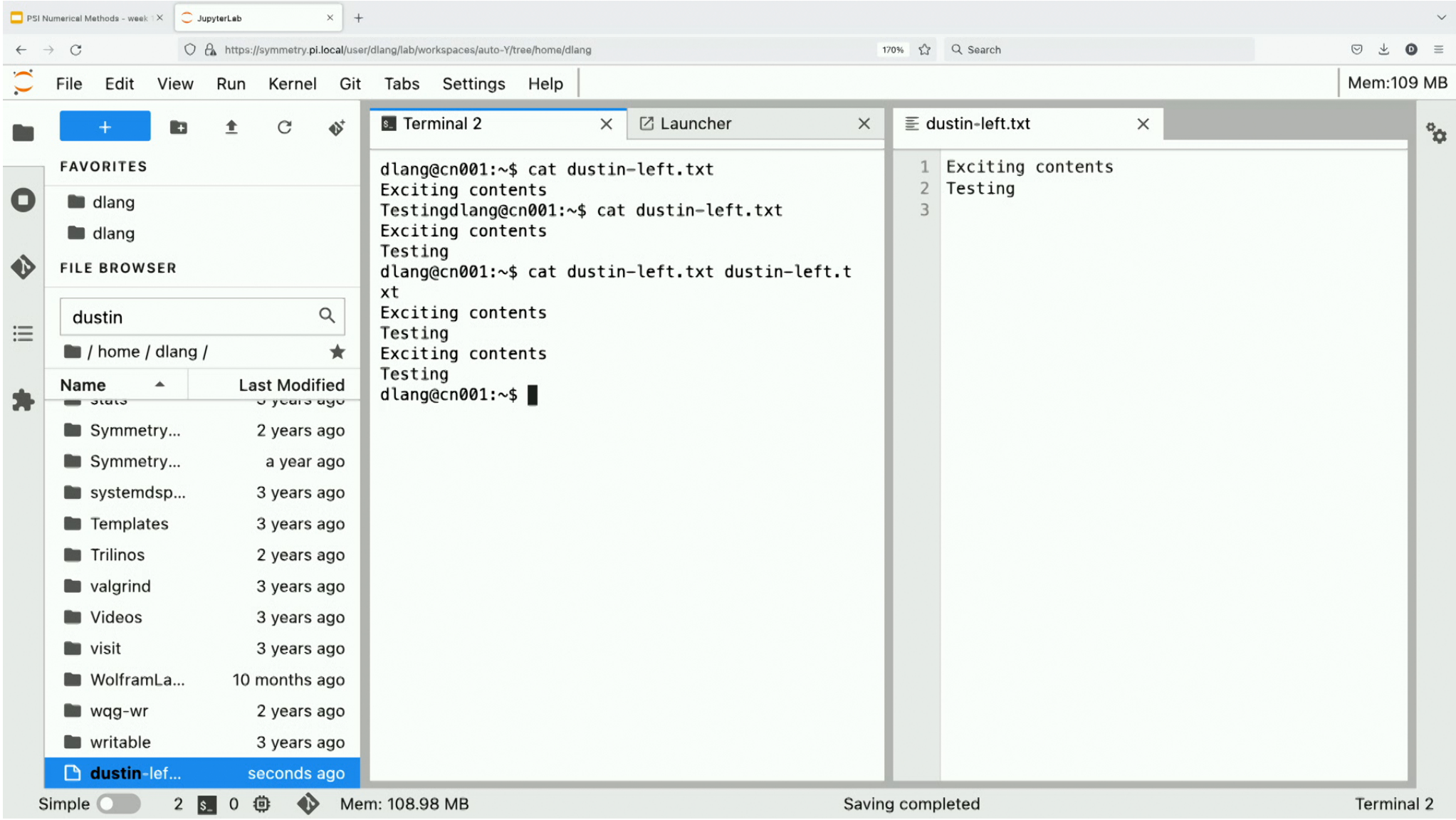

PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
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Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
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Filter files by name
/ home / dlang /
Name
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7E7DBF60... 3 years ago
aryanna 9 months ago
astrometry 9 months ago
astrometry1 2 years ago
ATTIC 3 years ago
bilby-git 13 hours ago
bin 2 years ago
chime 3 years ago
cmc 3 years ago
Computati... 3 years ago
conda-an 9 months ago
conda-jup... 3 years ago
Terminal 2
Launcher
adcli-krb5-VrGDMg ssh-qveJwsx95CJK
adcli-krb5-WjTr7o ssh-SMmsIWntdPcz
adcli-krb5-wwKi57 ssh-U12liDktk7Cw
adcli-krb5-x05xwL ssh-VLg8cERw5Ne2
adcli-krb5-X1ZeR7 ssh-vlkWHgKgYgOS
adcli-krb5-xEdT41 ssh-vOL0u2UFw1qF
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adcli-krb5-xry0dM ssh-WX1qbEzMesCl
adcli-krb5-xXvQZn ssh-XE6NU2Ucs0FC
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adcli-krb5-YK5xV8 systemd-private-101d56bc509b4f15baa255152ac4d289-haveged.service-tWQhX4
adcli-krb5-yoxRV6 systemd-private-101d56bc509b4f15baa255152ac4d289-ntp.service-1mCpfk
adcli-krb5-YVYorD systemd-private-101d56bc509b4f15baa255152ac4d289-rtkit-daemon.service-z3hRs5
adcli-krb5-yxTKi8 systemd-private-101d56bc509b4f15baa255152ac4d289-systemd-resolved.service-tXCBcK
adcli-krb5-z5uywS Temp-e33d6de1-2557-49df-8e48-af0de0864c05
adcli-krb5-ZHg3Bh tmpaddon
adcli-krb5-zQe6Ru tmpaddon-5ee488
data tmux-70517
dustin-was-here
dlang@cn001:/tmp$ ls /tmp/dustin-was-here
/tmp/dustin-was-here
dlang@cn001:/tmp$ ls /tmp/d
data/ dustin-was-here dvipdfmx.QiyWQu dvipdfmx.rb3mIp
dlang@cn001:/tmp$ ls /tmp/d
data/ dustin-was-here dvipdfmx.QiyWQu dvipdfmx.rb3mIp
dlang@cn001:/tmp$ ls /tmp/dustin-was-here
/tmp/dustin-was-here
dlang@cn001:/tmp$ rm dustin-was-here
dlang@cn001:/tmp$
Simple
2 0
Mem: 108.95 MB
Terminal 2

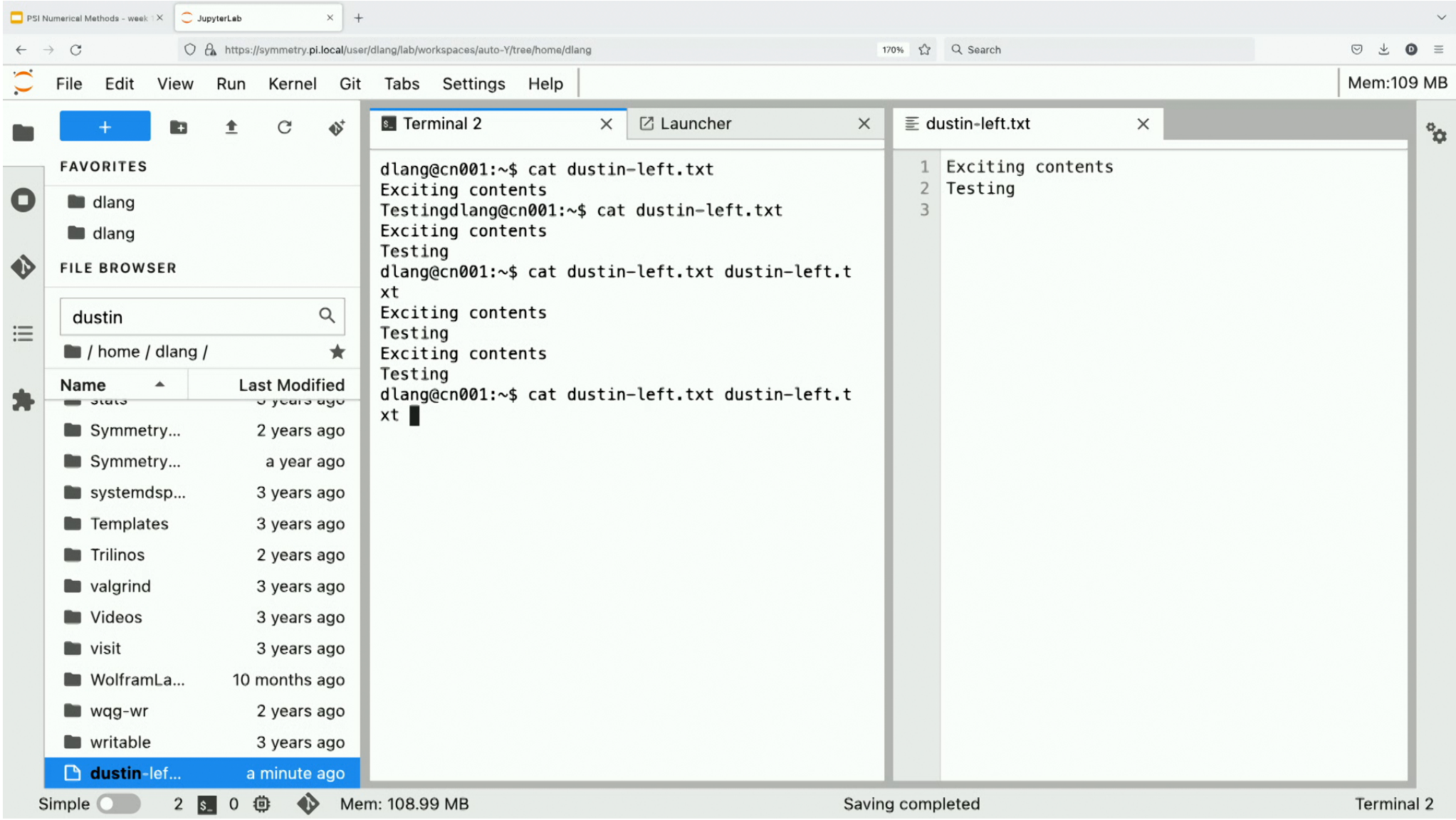

PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
dlang
dlang
FILE BROWSER
Filter files by name
/ home / dlang /
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Last Modified
7E7DBF60... 3 years ago
aryanna 9 months ago
astrometry 9 months ago
astrometry1 2 years ago
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bilby-git 14 hours ago
bin 2 years ago
chime 3 years ago
cmc 3 years ago
Computati... 3 years ago
conda-an 9 months ago
conda-jup... 3 years ago
Terminal 2
Launcher
496 cat jupyterhub_slurm_354117.log
497 ssh cn002
498 #conda update -n base -c defaults conda
499 sudo -H bash
500 sudo -H bash
501 pwd
502 cd l
503 cd /
504 ls
505 cd tmp
506 ls
507 cd /usr/local/bin
508 cd /
509 cd usr
510 cd local
511 cd bin
512 cd ..
513 clear
514 touch dustin-was-here
515 cd /tmp
516 touch dustin-was-here
517 ls
518 ls /tmp/dustin-was-here
519 ls /tmp/dustin-was-here
520 rm dustin-was-here
521 history
dlang@cn001:/tmp$
dlang@cn001:/tmp$
(reverse-i-search)`':
Simple
2
0
Mem: 108.95 MB
Terminal 2

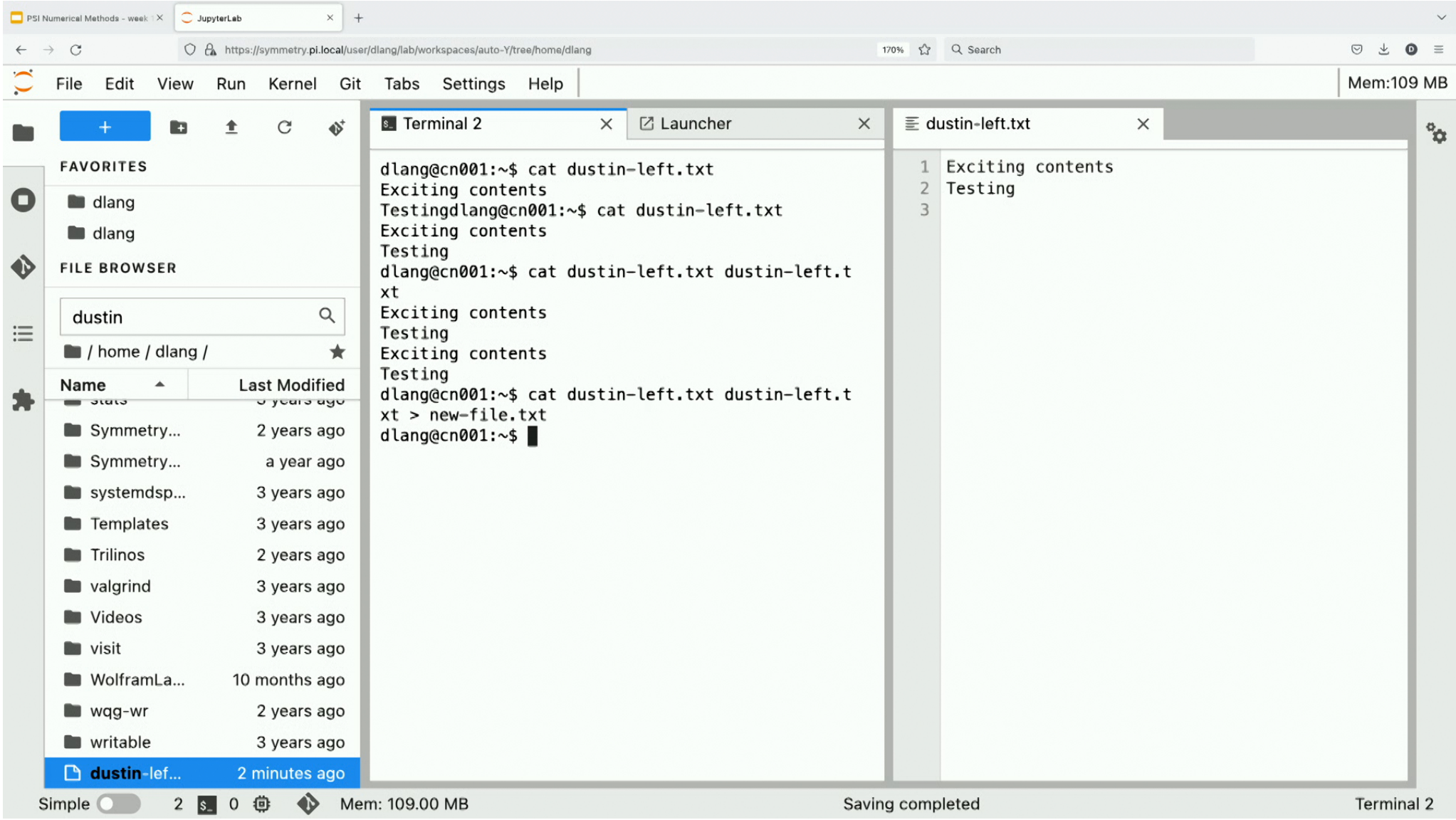

PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang/dustin-left.txt
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
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dlang
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dustin
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Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
dustin-lef... seconds ago
Terminal 2
dustin-left.txt
Launcher
1 Exciting contents
2 Testing
Simple
2
0
Plain Text
Mem: 108.98 MB
Saving completed
Ln 2, Col 8
Spaces: 4
dustin-left.txt

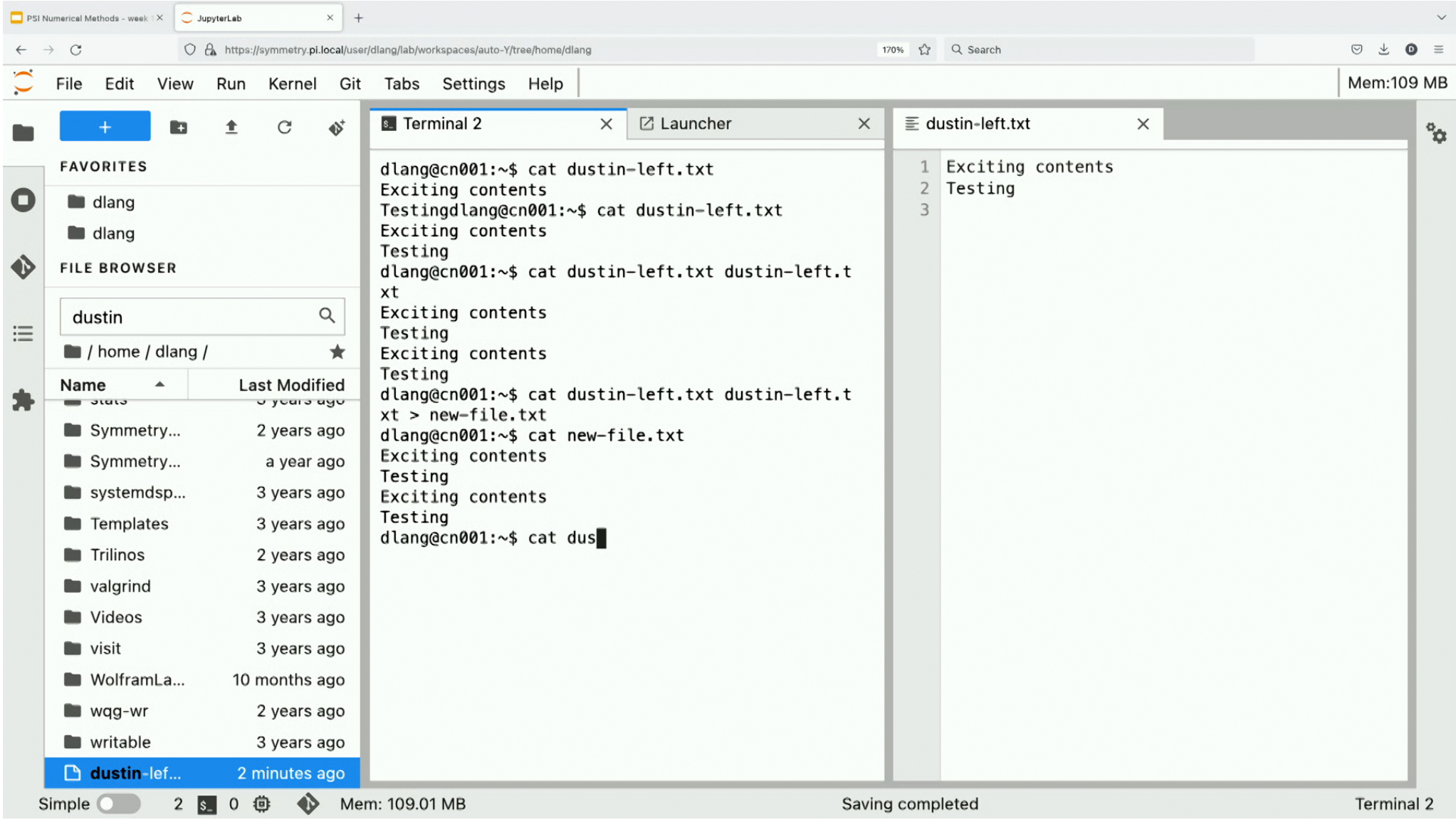

PSI Numerical Methods - week 1
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
dlang
dlang
FILE BROWSER
dustin
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
dustin-lef... seconds ago
Terminal 2
Launcher
dlang@cn001:~$
dustin-left.txt
1 Exciting contents
2 Testing
Simple
2
0
Mem: 108.98 MB
Saving completed
Terminal 2

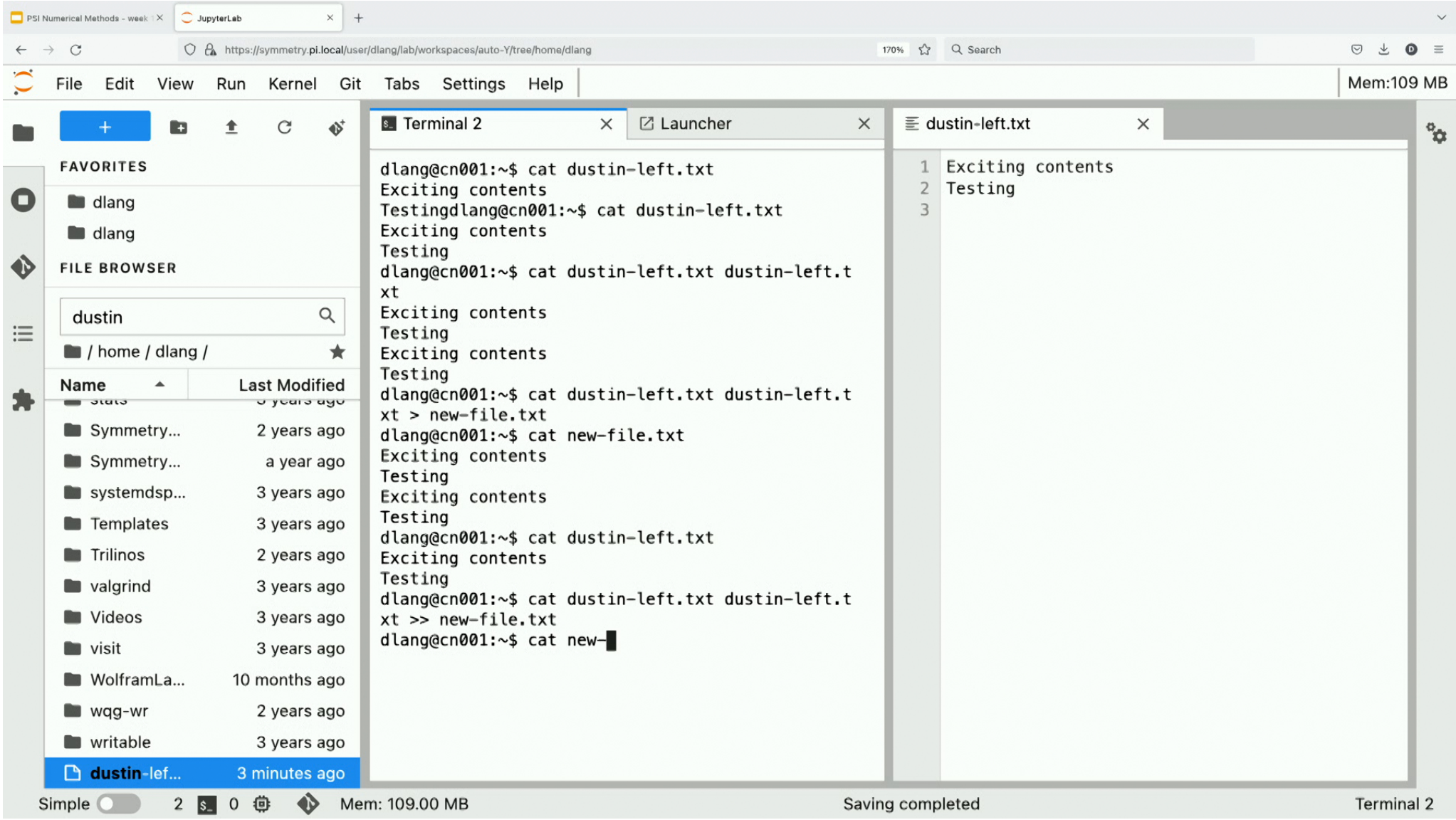

PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
dlang
dlang
FILE BROWSER
dustin
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
dustin-lef... seconds ago
Terminal 2
Launcher
dlang@cn001:~$ cat dustin-left.txt
Exciting contents
Testingdlang@cn001:~$ cat dustin-left.txt
Exciting contents
Testing
dlang@cn001:~$
dustin-left.txt
1 Exciting contents
2 Testing
3
Simple
2
0
Mem: 109.00 MB
Saving completed
Terminal 2

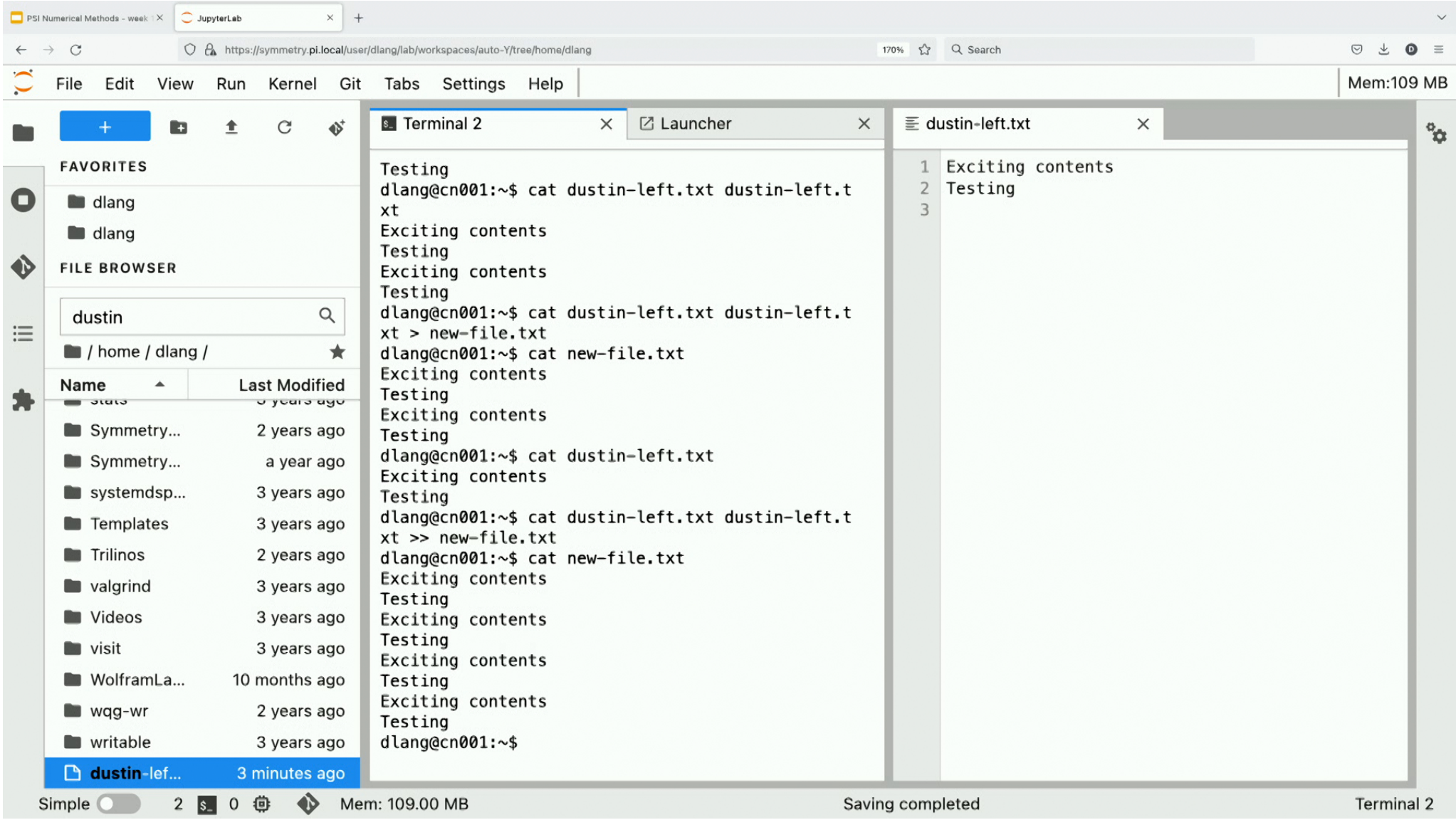

PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
dlang
dlang
FILE BROWSER
dustin
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
dustin-lef... seconds ago
Terminal 2
Launcher
dlang@cn001:~$ cat dustin-left.txt
Exciting contents
Testingdlang@cn001:~$ cat dustin-left.txt
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt dustin-left.t
xt
Exciting contents
Testing
Exciting contents
Testing
dlang@cn001:~$
dustin-left.txt
1 Exciting contents
2 Testing
3
Simple
2
0
Mem: 108.98 MB
Saving completed
Terminal 2

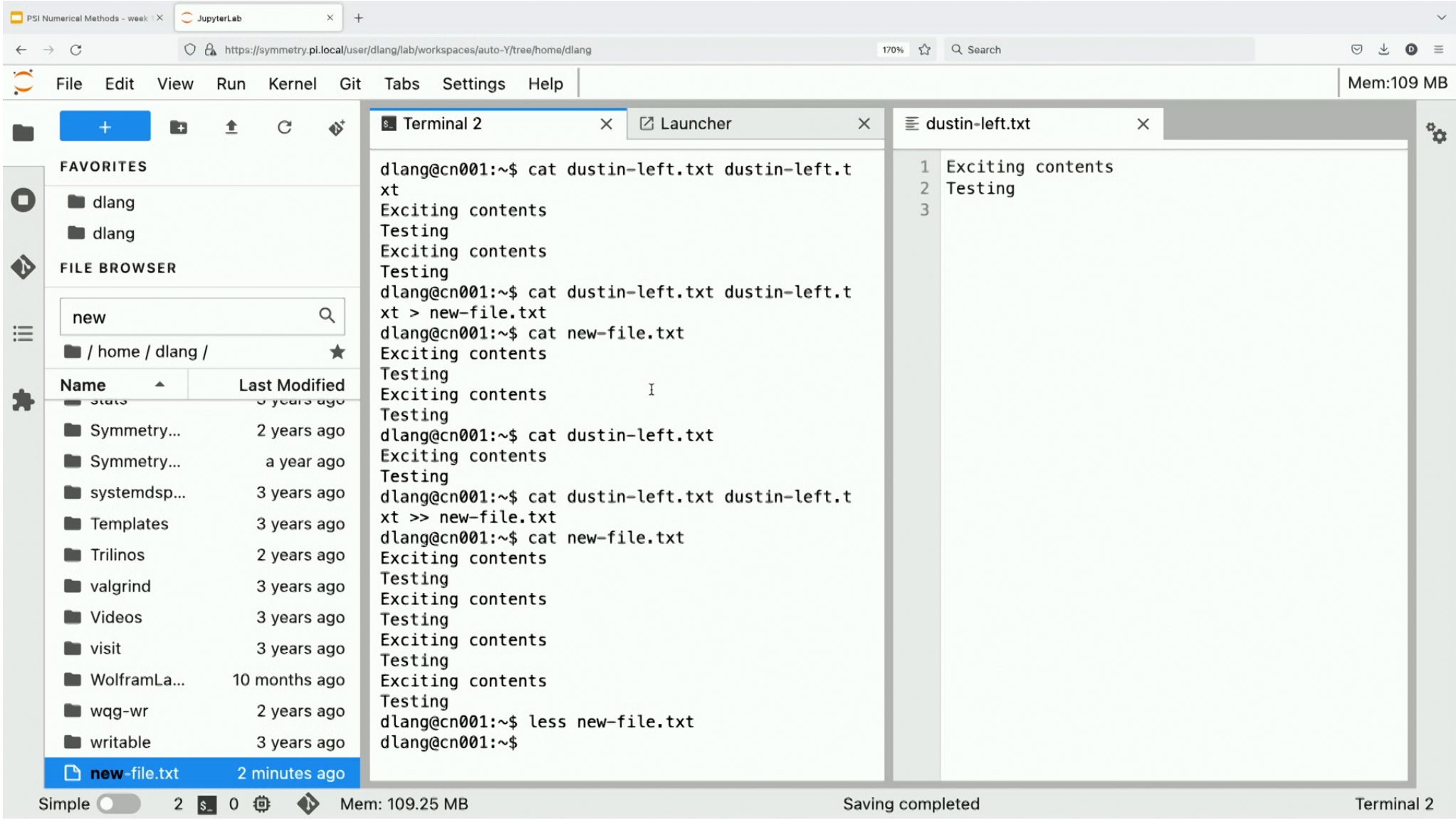

PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
dlang
dlang
FILE BROWSER
dustin
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
dustin-lef... a minute ago
Terminal 2
Launcher
dlang@cn001:~$ cat dustin-left.txt
Exciting contents
Testingdlang@cn001:~$ cat dustin-left.txt
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt dustin-left.t
xt
Exciting contents
Testing
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt dustin-left.t
xt
dustin-left.txt
1 Exciting contents
2 Testing
3
Simple
2
0
Mem: 108.99 MB
Saving completed
Terminal 2

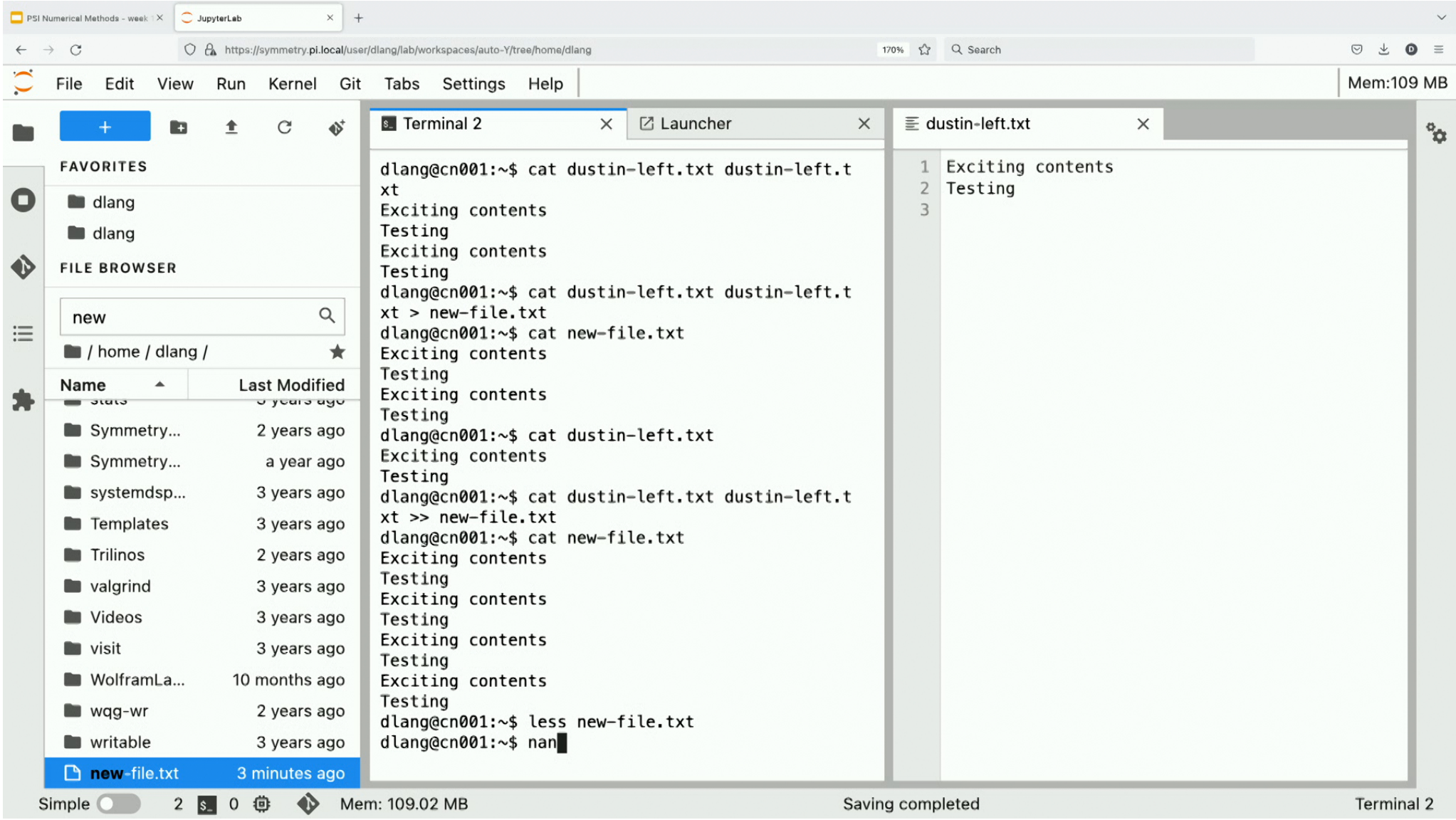

PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
dlang
dlang
FILE BROWSER
dustin
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
dustin-lef... 2 minutes ago
Terminal 2
Launcher
dlang@cn001:~$ cat dustin-left.txt
Exciting contents
Testingdlang@cn001:~$ cat dustin-left.txt
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt dustin-left.t
xt
Exciting contents
Testing
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt dustin-left.t
xt > new-file.txt
dlang@cn001:~$
dustin-left.txt
1 Exciting contents
2 Testing
3
Simple
2
0
Mem: 109.00 MB
Saving completed
Terminal 2

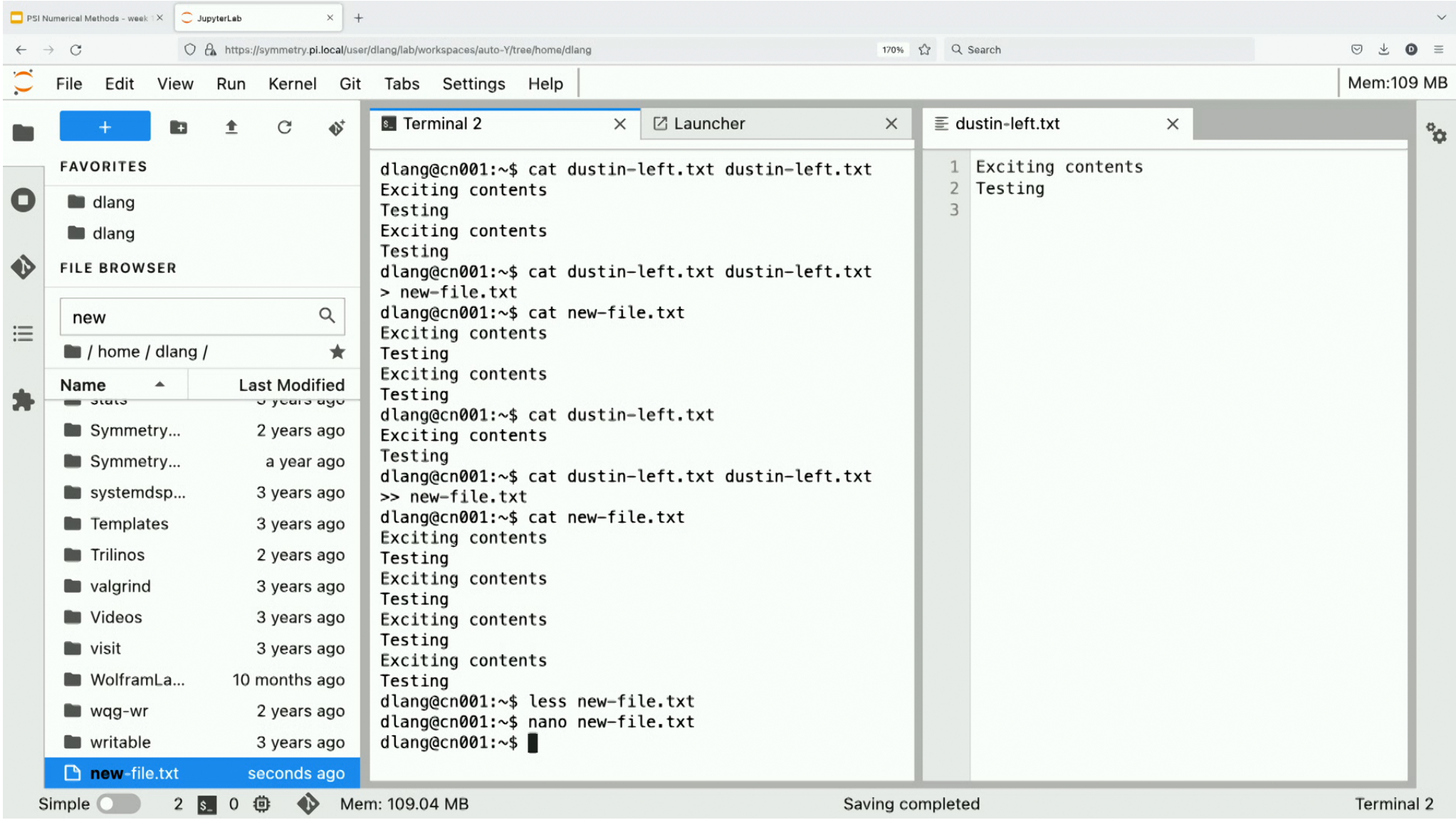

PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
dlang
dlang
FILE BROWSER
dustin
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
dustin-lef... 2 minutes ago
Terminal 2
Launcher
dlang@cn001:~$ cat dustin-left.txt
Exciting contents
Testingdlang@cn001:~$ cat dustin-left.txt
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt dustin-left.t
xt
Exciting contents
Testing
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt dustin-left.t
xt > new-file.txt
dlang@cn001:~$ cat new-file.txt
Exciting contents
Testing
Exciting contents
Testing
dlang@cn001:~$ cat dus
dustin-left.txt
1 Exciting contents
2 Testing
3
Simple
2
0
Mem: 109.01 MB
Saving completed
Terminal 2


PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
dlang
dlang
FILE BROWSER
dustin
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
dustin-lef... 3 minutes ago
Terminal 2
Launcher
dlang@cn001:~$ cat dustin-left.txt
Exciting contents
Testingdlang@cn001:~$ cat dustin-left.txt
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt dustin-left.t
xt
Exciting contents
Testing
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt dustin-left.t
xt > new-file.txt
dlang@cn001:~$ cat new-file.txt
Exciting contents
Testing
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt dustin-left.t
xt >> new-file.txt
dlang@cn001:~$ cat new-
dustin-left.txt
1 Exciting contents
2 Testing
3
Simple
2 0
Mem: 109.00 MB
Saving completed
Terminal 2


PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
dlang
dlang
FILE BROWSER
dustin
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
dustin-lef... 3 minutes ago
Terminal 2
Launcher
Testing
dlang@cn001:~$ cat dustin-left.txt dustin-left.t
xt
Exciting contents
Testing
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt dustin-left.t
xt > new-file.txt
dlang@cn001:~$ cat new-file.txt
Exciting contents
Testing
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt dustin-left.t
xt >> new-file.txt
dlang@cn001:~$ cat new-file.txt
Exciting contents
Testing
Exciting contents
Testing
Exciting contents
Testing
Exciting contents
Testing
dlang@cn001:~$
dustin-left.txt
1 Exciting contents
2 Testing
3
Simple
2 0
Mem: 109.00 MB
Saving completed
Terminal 2


PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 2 minutes ago
Terminal 2
Launcher
dlang@cn001:~$ cat dustin-left.txt dustin-left.t
xt
Exciting contents
Testing
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt dustin-left.t
xt > new-file.txt
dlang@cn001:~$ cat new-file.txt
Exciting contents
Testing
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt dustin-left.t
xt >> new-file.txt
dlang@cn001:~$ cat new-file.txt
Exciting contents
Testing
Exciting contents
Testing
Exciting contents
Testing
Exciting contents
Testing
dlang@cn001:~$ less new-file.txt
dlang@cn001:~$
dustin-left.txt
1 Exciting contents
2 Testing
3
Simple
2
0
Mem: 109.25 MB
Saving completed
Terminal 2

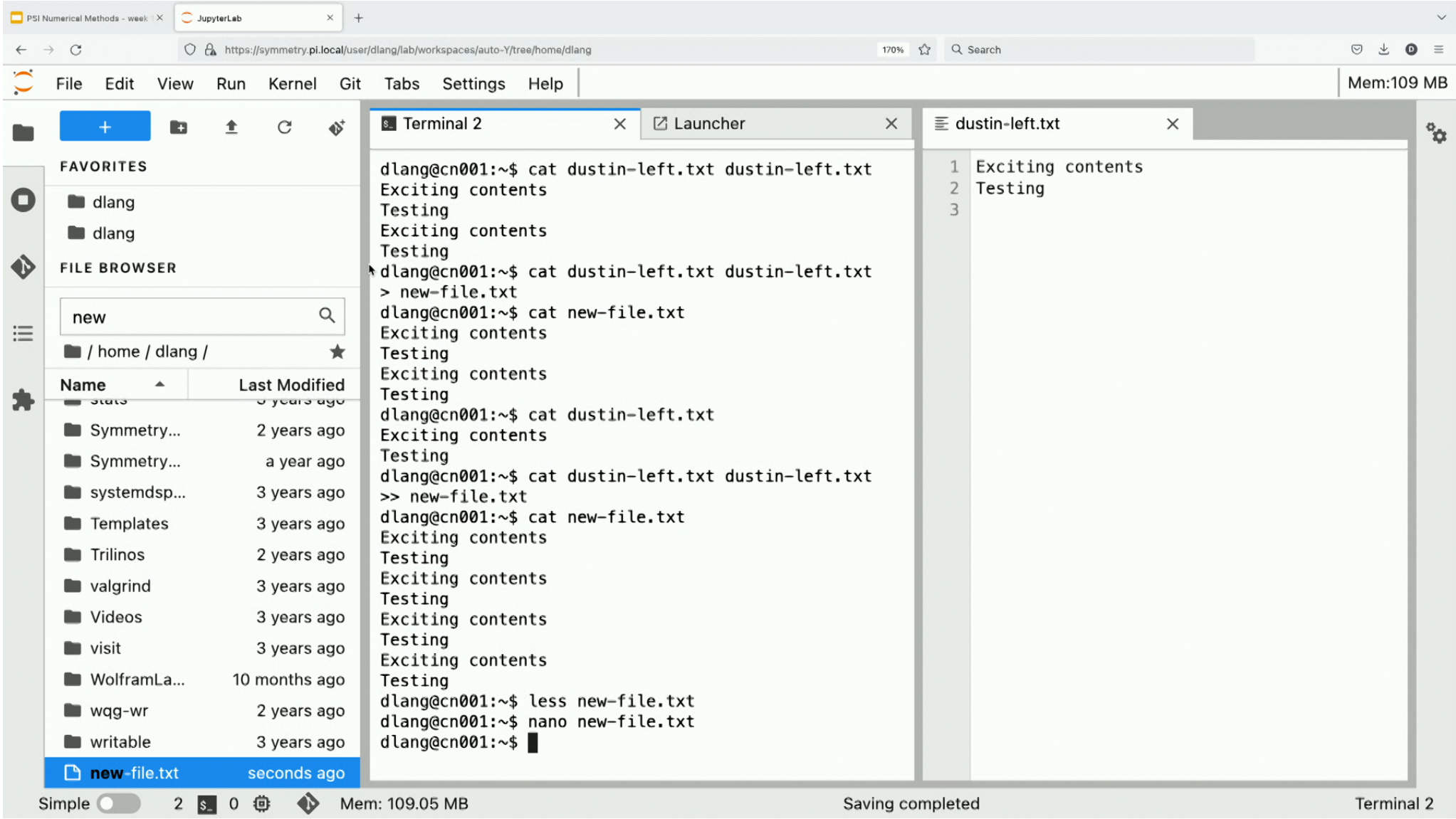

PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 3 minutes ago
Terminal 2
Launcher
dlang@cn001:~$ cat dustin-left.txt dustin-left.t
xt
Exciting contents
Testing
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt dustin-left.t
xt > new-file.txt
dlang@cn001:~$ cat new-file.txt
Exciting contents
Testing
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt dustin-left.t
xt >> new-file.txt
dlang@cn001:~$ cat new-file.txt
Exciting contents
Testing
Exciting contents
Testing
Exciting contents
Testing
Exciting contents
Testing
dlang@cn001:~$ less new-file.txt
dlang@cn001:~$ nan
dustin-left.txt
1 Exciting contents
2 Testing
3
Simple
2 0
Mem: 109.02 MB
Saving completed
Terminal 2

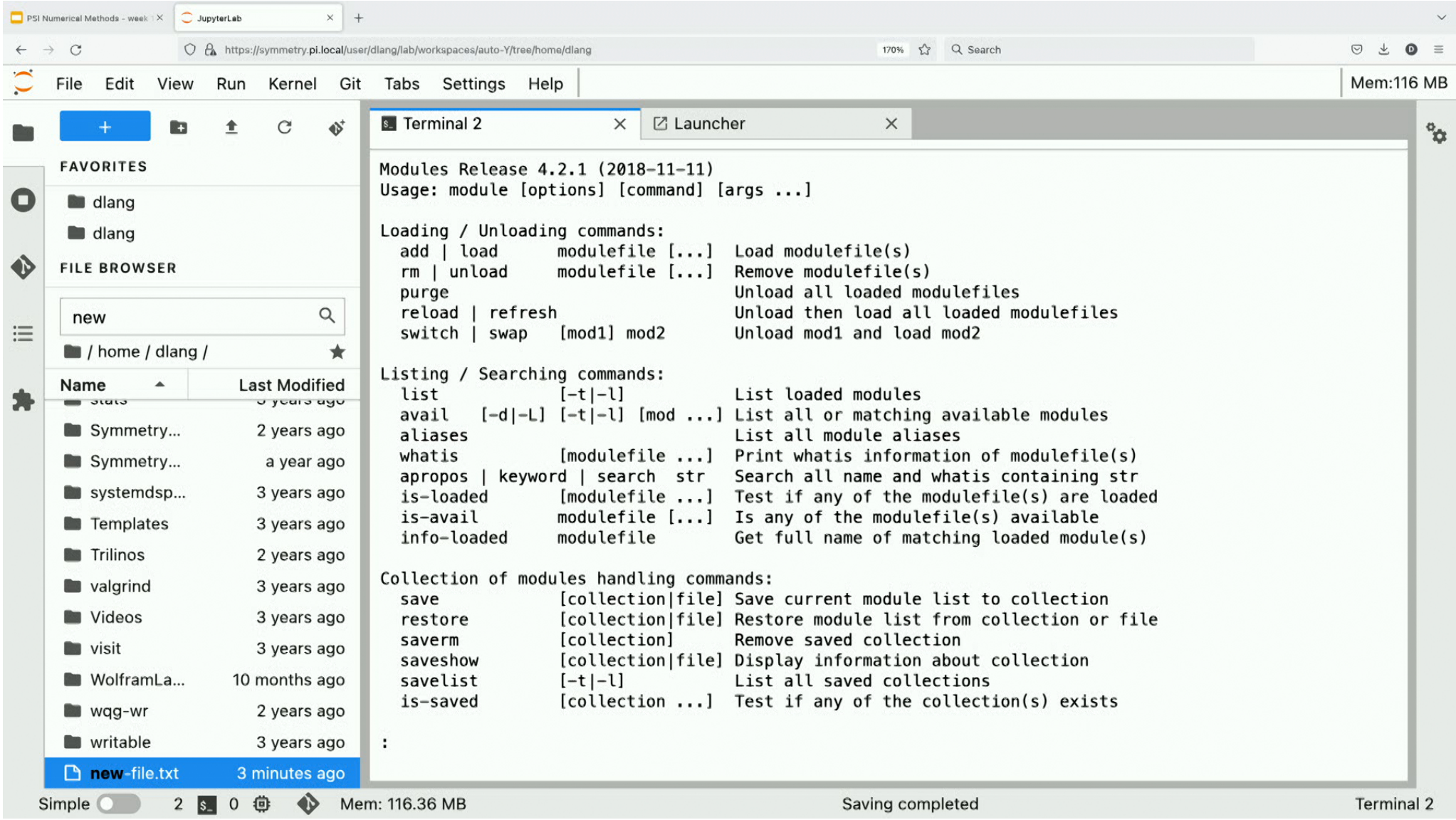

PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt seconds ago
Terminal 2
Launcher
dlang@cn001:~$ cat dustin-left.txt dustin-left.txt
Exciting contents
Testing
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt dustin-left.txt
> new-file.txt
dlang@cn001:~$ cat new-file.txt
Exciting contents
Testing
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt dustin-left.txt
>> new-file.txt
dlang@cn001:~$ cat new-file.txt
Exciting contents
Testing
Exciting contents
Testing
Exciting contents
Testing
Exciting contents
Testing
dlang@cn001:~$ less new-file.txt
dlang@cn001:~$ nano new-file.txt
dlang@cn001:~$
dustin-left.txt
1 Exciting contents
2 Testing
3
Simple
2
0
Mem: 109.04 MB
Saving completed
Terminal 2

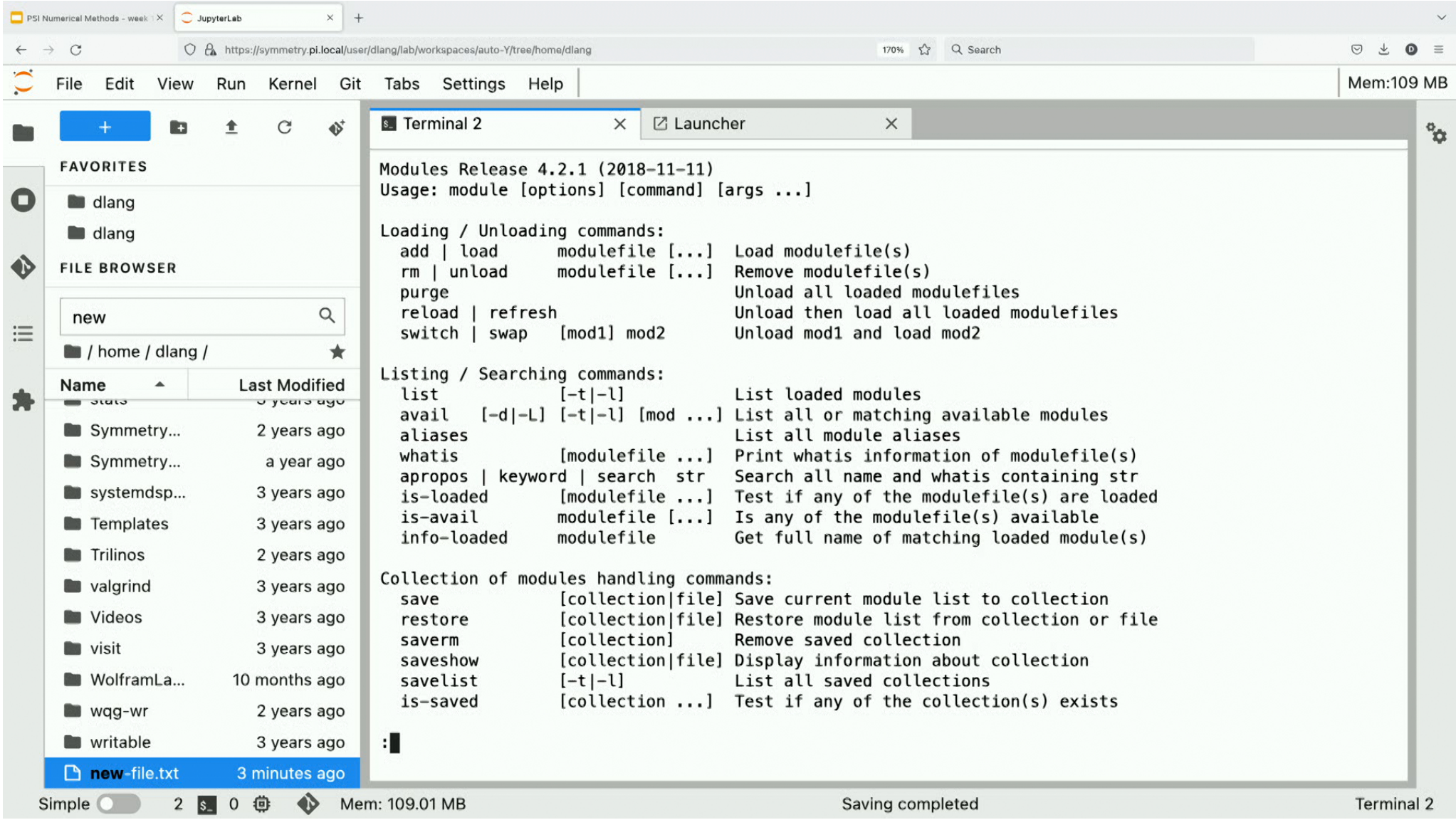
PSI Numerical Methods - week 1

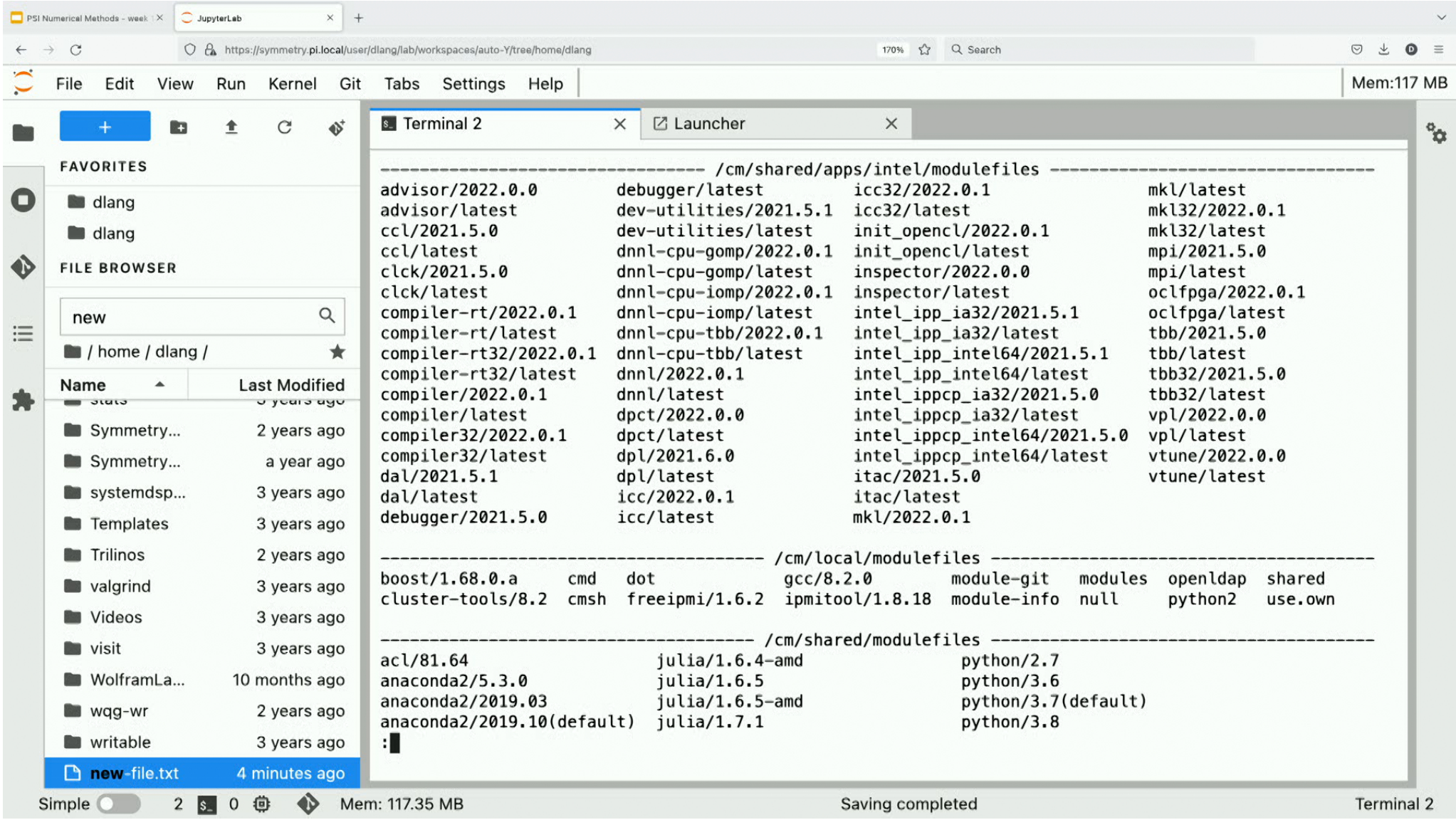
Setting up the Julia notebook kernel on Symmetry

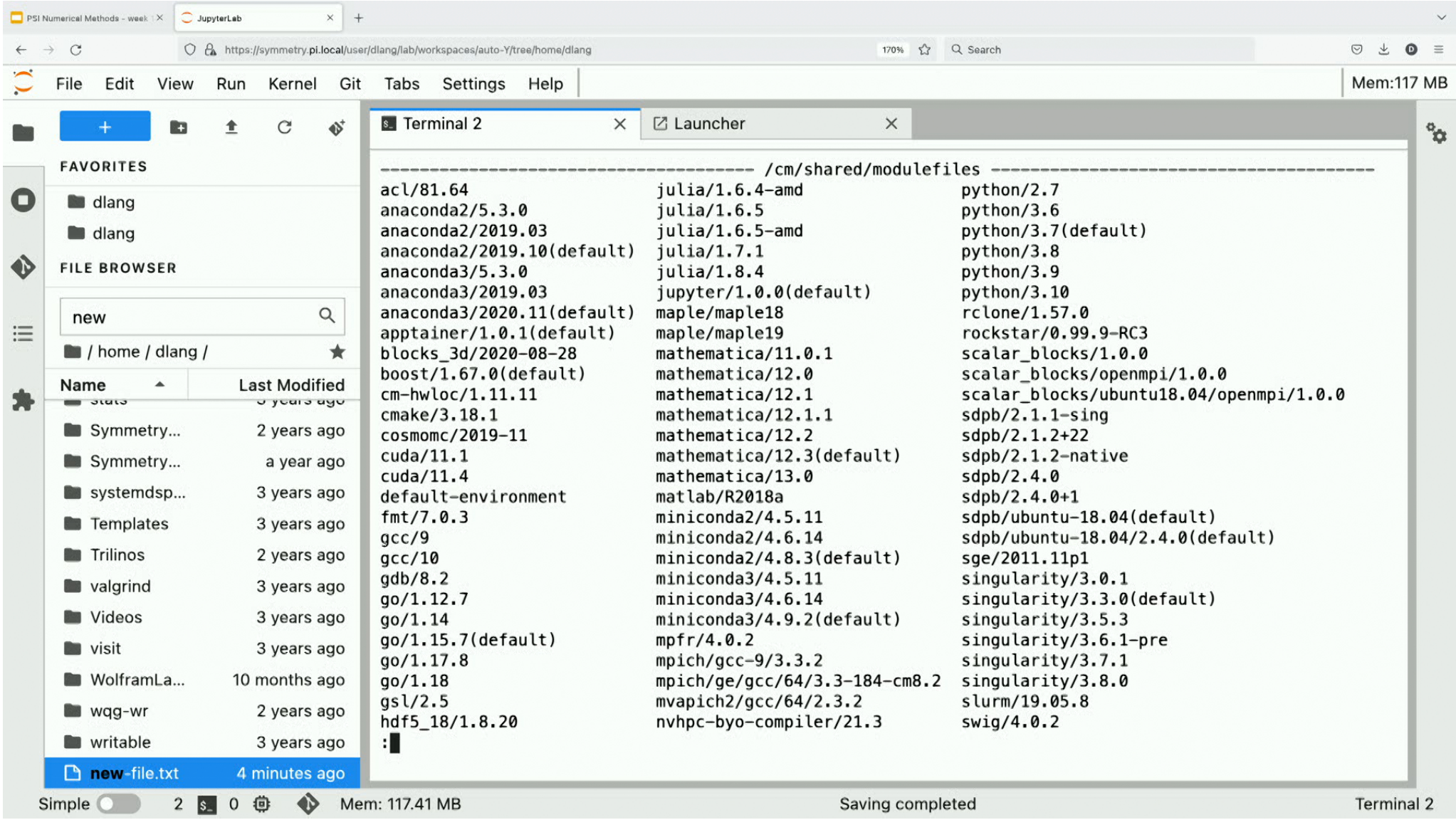
- In Jupyterhub, start a new Terminal notebook
- `> module load julia`
- `> julia`
- `using Pkg`
- `Pkg.add("IJulia")`

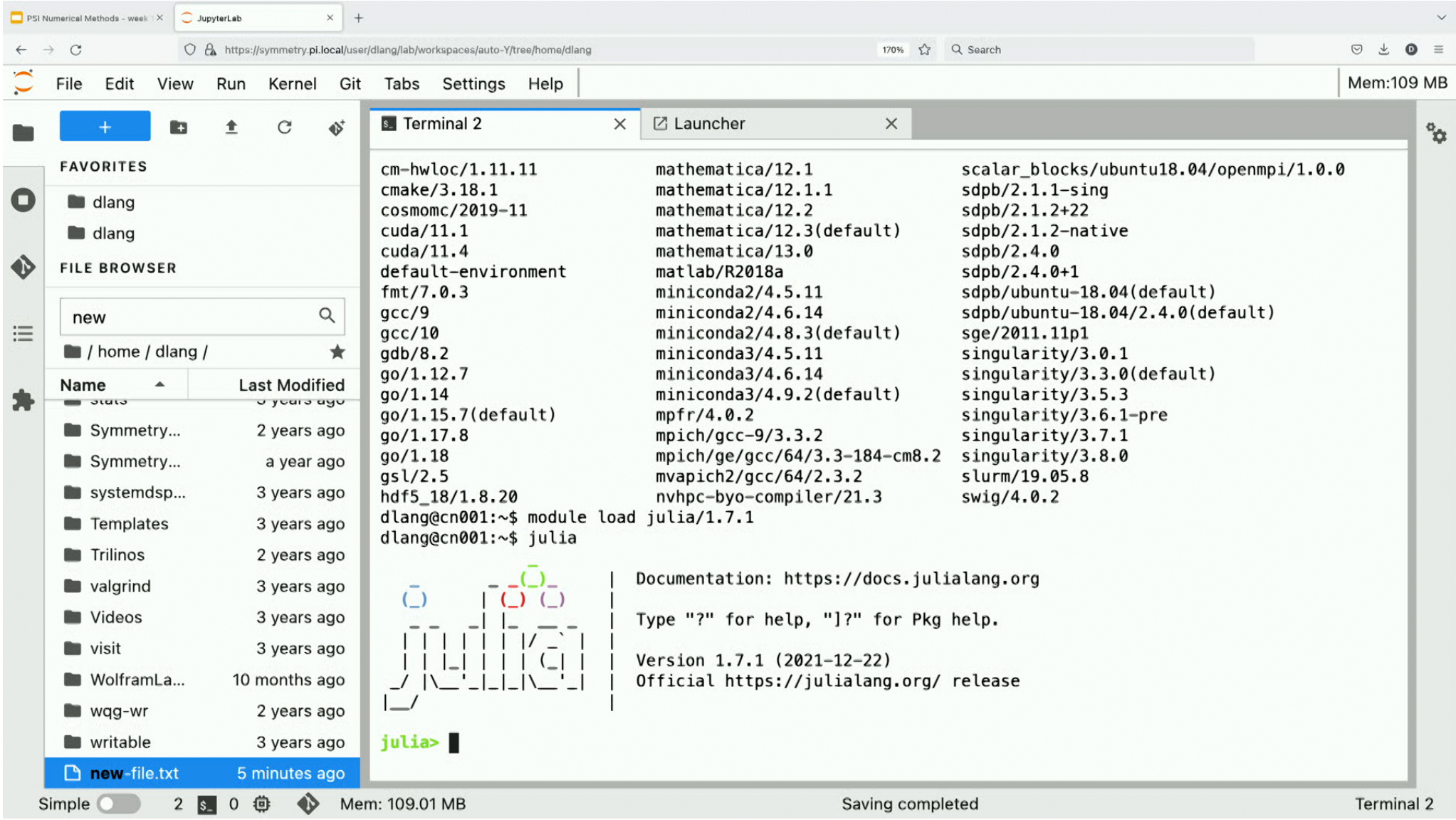

PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt seconds ago
Terminal 2
Launcher
dlang@cn001:~$ cat dustin-left.txt dustin-left.txt
Exciting contents
Testing
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt dustin-left.txt
> new-file.txt
dlang@cn001:~$ cat new-file.txt
Exciting contents
Testing
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt
Exciting contents
Testing
dlang@cn001:~$ cat dustin-left.txt dustin-left.txt
>> new-file.txt
dlang@cn001:~$ cat new-file.txt
Exciting contents
Testing
Exciting contents
Testing
Exciting contents
Testing
Exciting contents
Testing
dlang@cn001:~$ less new-file.txt
dlang@cn001:~$ nano new-file.txt
dlang@cn001:~$
dustin-left.txt
1 Exciting contents
2 Testing
3
Simple
2
0
Mem: 109.05 MB
Saving completed
Terminal 2

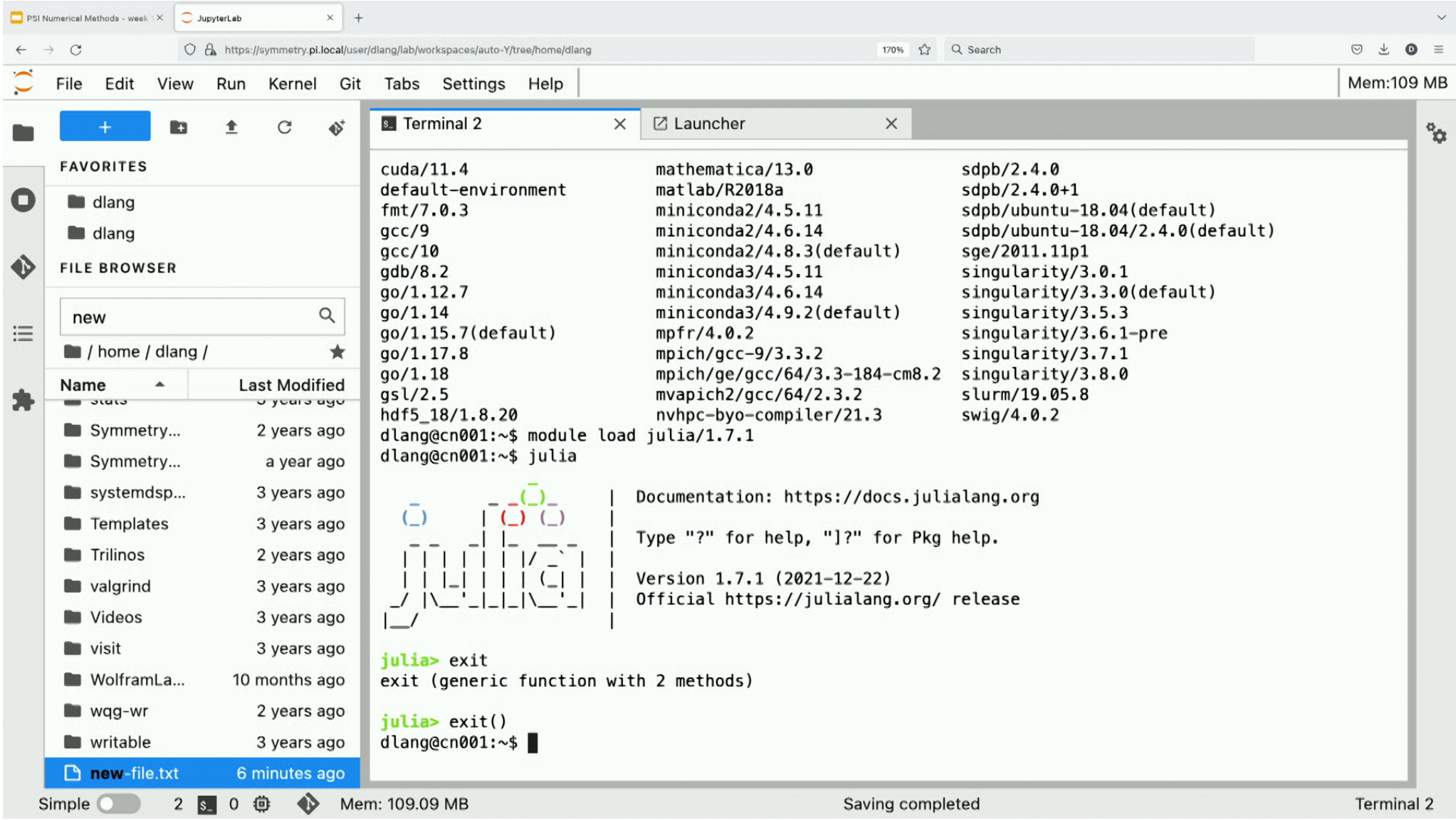

PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:116 MB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 3 minutes ago
Terminal 2
Launcher
Modules Release 4.2.1 (2018-11-11)
Usage: module [options] [command] [args ...]
Loading / Unloading commands:
add | load modulefile [...] Load modulefile(s)
rm | unload modulefile [...] Remove modulefile(s)
purge Unload all loaded modulefiles
reload | refresh Unload then load all loaded modulefiles
switch | swap [mod1] mod2 Unload mod1 and load mod2
Listing / Searching commands:
list [-t|-l] List loaded modules
avail [-d|-L] [-t|-l] [mod ...] List all or matching available modules
aliases List all module aliases
whatis [modulefile ...] Print whatis information of modulefile(s)
apropos | keyword | search str Search all name and whatis containing str
is-loaded [modulefile ...] Test if any of the modulefile(s) are loaded
is-avail modulefile [...] Is any of the modulefile(s) available
info-loaded modulefile Get full name of matching loaded module(s)
Collection of modules handling commands:
save [collection|file] Save current module list to collection
restore [collection|file] Restore module list from collection or file
saverm [collection] Remove saved collection
saveshow [collection|file] Display information about collection
savelist [-t|-l] List all saved collections
is-saved [collection ...] Test if any of the collection(s) exists
:
Simple
2
0
Mem: 116.36 MB
Saving completed
Terminal 2

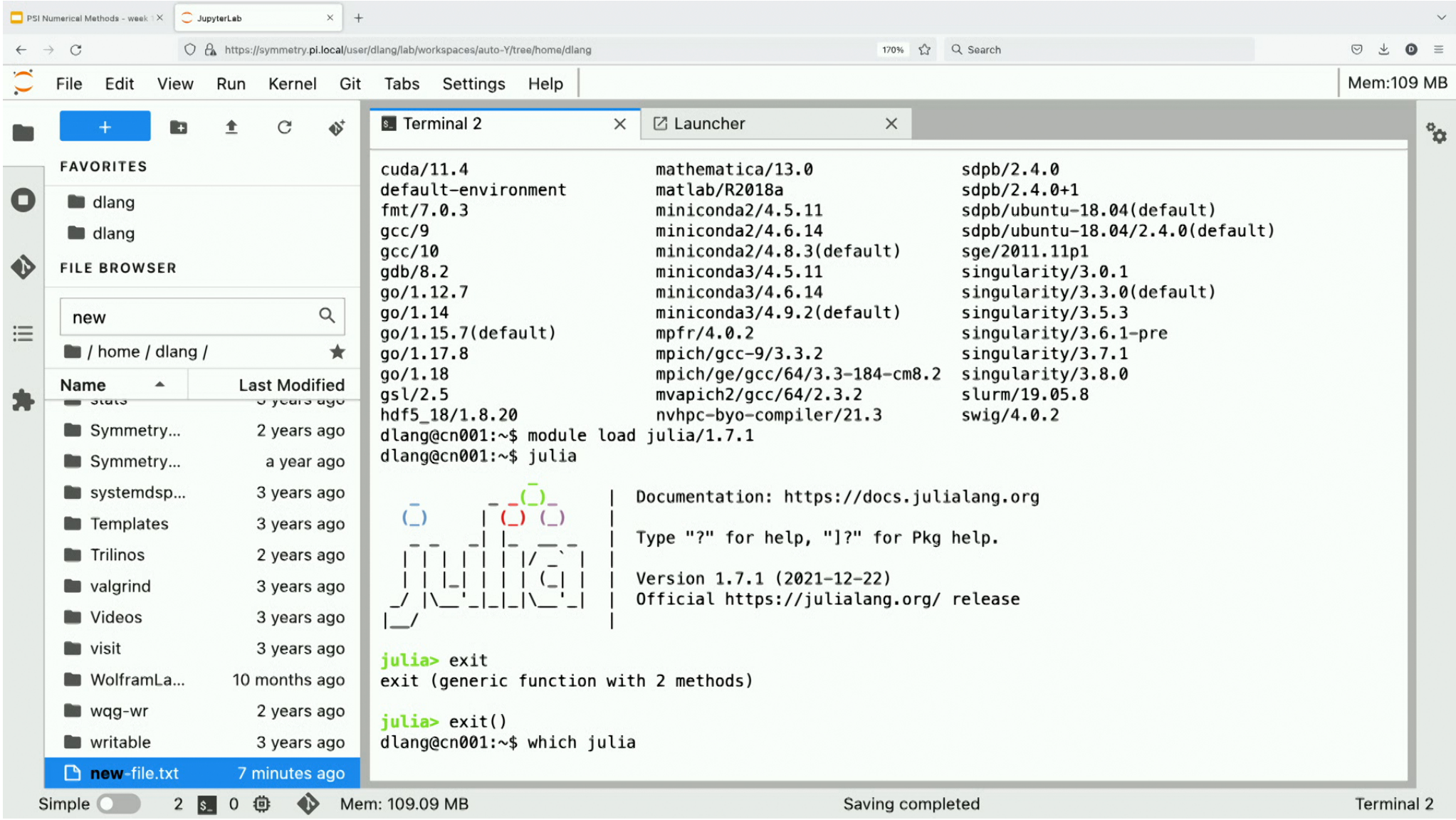

PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 3 minutes ago
Terminal 2
Launcher
Modules Release 4.2.1 (2018-11-11)
Usage: module [options] [command] [args ...]
Loading / Unloading commands:
add | load modulefile [...] Load modulefile(s)
rm | unload modulefile [...] Remove modulefile(s)
purge Unload all loaded modulefiles
reload | refresh Unload then load all loaded modulefiles
switch | swap [mod1] mod2 Unload mod1 and load mod2
Listing / Searching commands:
list [-t|-l] List loaded modules
avail [-d|-L] [-t|-l] [mod ...] List all or matching available modules
aliases List all module aliases
whatis [modulefile ...] Print whatis information of modulefile(s)
apropos | keyword | search str Search all name and whatis containing str
is-loaded [modulefile ...] Test if any of the modulefile(s) are loaded
is-avail modulefile [...] Is any of the modulefile(s) available
info-loaded modulefile Get full name of matching loaded module(s)
Collection of modules handling commands:
save [collection|file] Save current module list to collection
restore [collection|file] Restore module list from collection or file
saverm [collection] Remove saved collection
saveshow [collection|file] Display information about collection
savelist [-t|-l] List all saved collections
is-saved [collection ...] Test if any of the collection(s) exists
:
Simple
2
0
Mem: 109.01 MB
Saving completed
Terminal 2

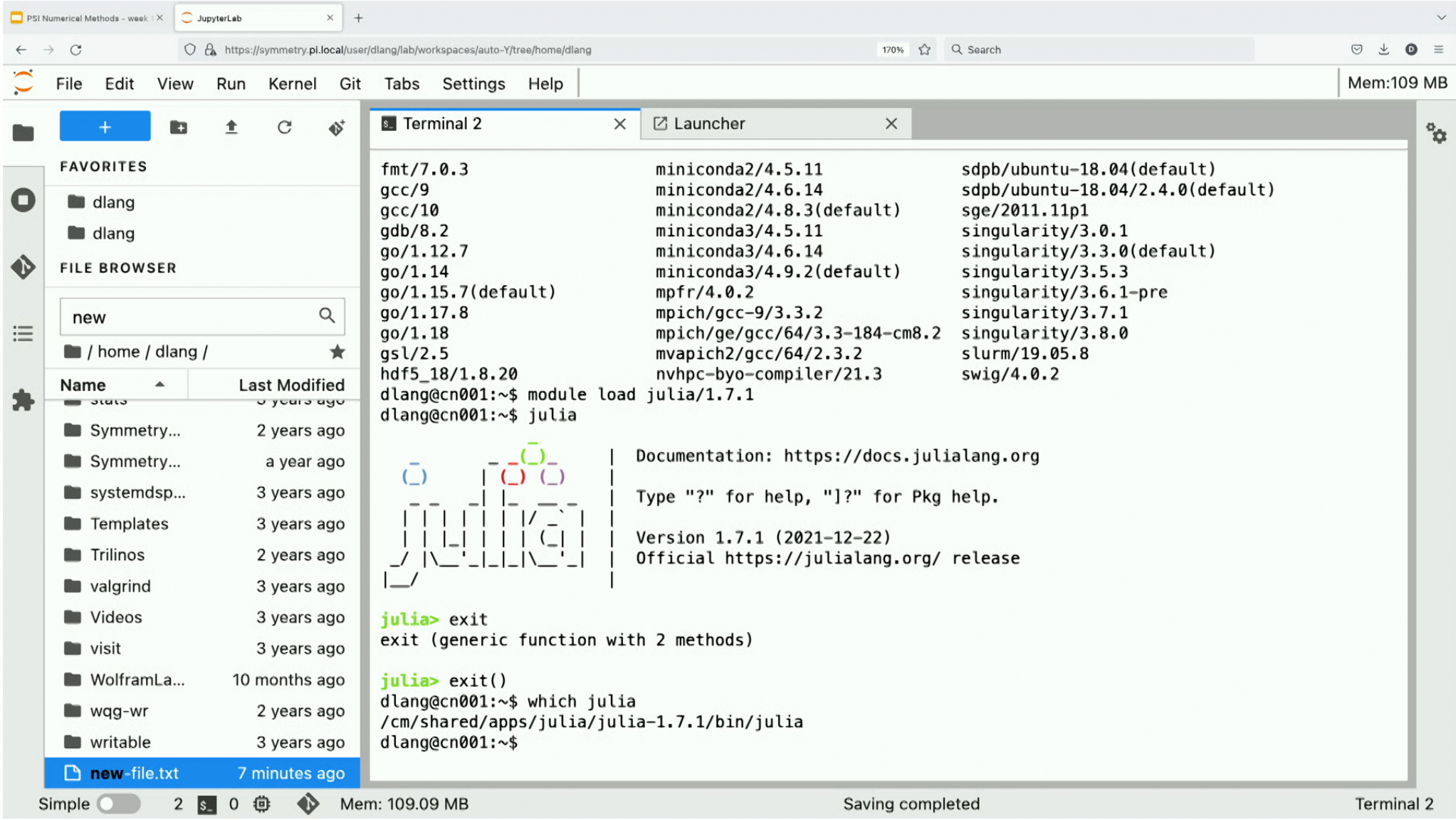

PSI Numerical Methods - week 1
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:117 MB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 4 minutes ago
Terminal 2
Launcher
---------- /cm/shared/apps/intel/modulefiles ----------
advisor/2022.0.0 debugger/latest icc32/2022.0.1 mkl/latest
advisor/latest dev-utilities/2021.5.1 icc32/latest mkl32/2022.0.1
ccl/2021.5.0 dev-utilities/latest init_opencl/2022.0.1 mkl32/latest
ccl/latest dnnl-cpu-gomp/2022.0.1 init_opencl/latest mpi/2021.5.0
clck/2021.5.0 dnnl-cpu-gomp/latest inspector/2022.0.0 mpi/latest
clck/latest dnnl-cpu-iomp/2022.0.1 inspector/latest oclfpga/2022.0.1
compiler-rt/2022.0.1 dnnl-cpu-iomp/latest intel_ipp_ia32/2021.5.1 oclfpga/latest
compiler-rt/latest dnnl-cpu-tbb/2022.0.1 intel_ipp_ia32/latest tbb/2021.5.0
compiler-rt32/2022.0.1 dnnl-cpu-tbb/latest intel_ipp_intel64/2021.5.1 tbb/latest
compiler-rt32/latest dnnl/2022.0.1 intel_ipp_intel64/latest tbb32/2021.5.0
compiler/2022.0.1 dnnl/latest intel_ippcp_ia32/2021.5.0 tbb32/latest
compiler/latest dpct/2022.0.0 intel_ippcp_ia32/latest vpl/2022.0.0
compiler32/2022.0.1 dpct/latest intel_ippcp_intel64/2021.5.0 vpl/latest
compiler32/latest dpl/2021.6.0 intel_ippcp_intel64/latest vtune/2022.0.0
dal/2021.5.1 dpl/latest itac/2021.5.0 vtune/latest
dal/latest icc/2022.0.1 itac/latest
debugger/2021.5.0 icc/latest mkl/2022.0.1
---------- /cm/local/modulefiles ----------
boost/1.68.0.a cmd dot gcc/8.2.0 module-git modules openldap shared
cluster-tools/8.2 cmsh freeipmi/1.6.2 ipmitool/1.8.18 module-info null python2 use.own
---------- /cm/shared/modulefiles ----------
acl/81.64 julia/1.6.4-amd python/2.7
anaconda2/5.3.0 julia/1.6.5 python/3.6
anaconda2/2019.03 julia/1.6.5-amd python/3.7(default)
anaconda2/2019.10(default) julia/1.7.1 python/3.8
:
Simple
2
0
Mem: 117.35 MB
Saving completed
Terminal 2

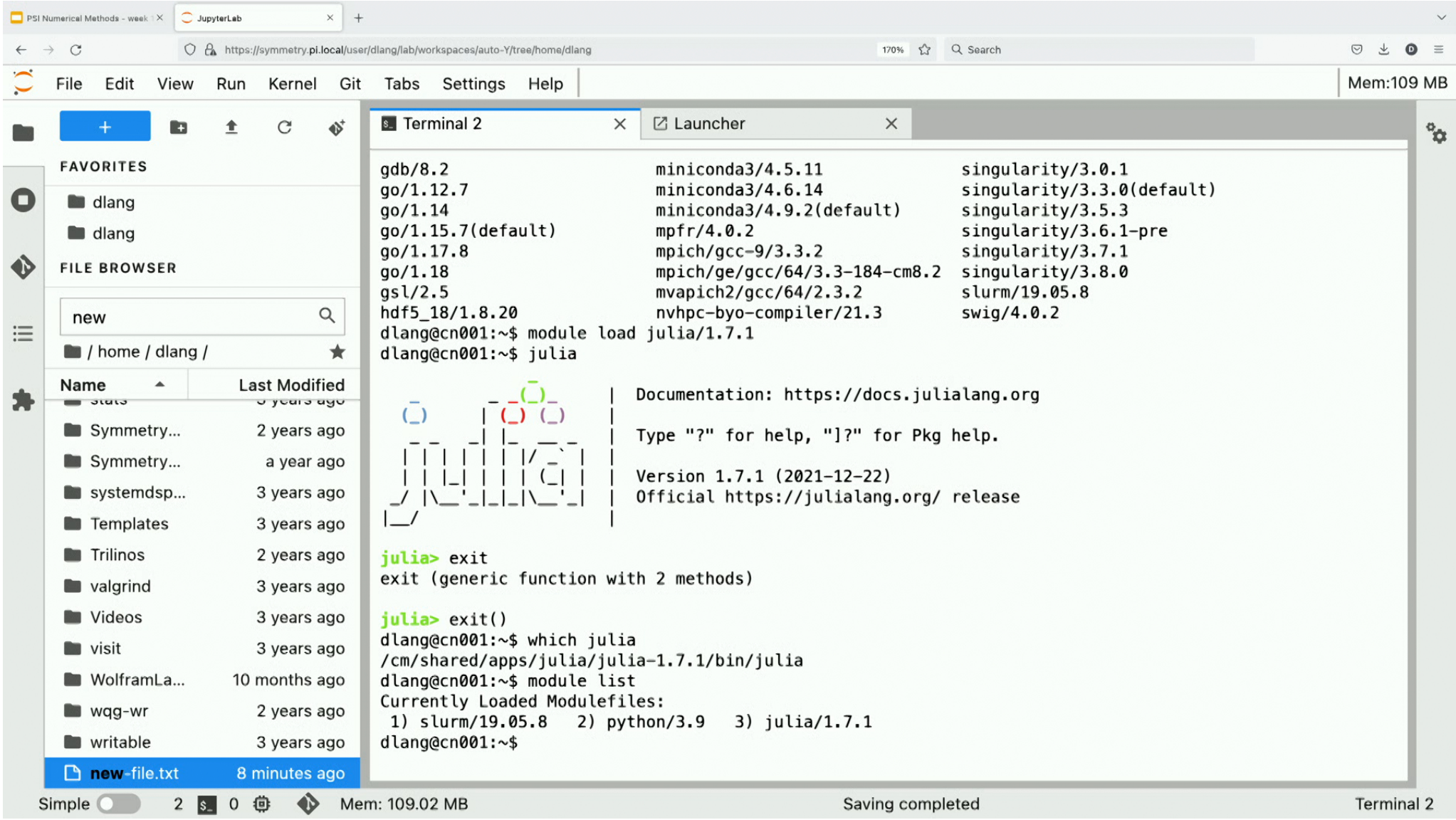

PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:117 MB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 4 minutes ago
Terminal 2
Launcher
---------- /cm/shared/modulefiles ----------
acl/81.64
anaconda2/5.3.0
anaconda2/2019.03
anaconda2/2019.10(default)
anaconda3/5.3.0
anaconda3/2019.03
anaconda3/2020.11(default)
apptainer/1.0.1(default)
blocks_3d/2020-08-28
boost/1.67.0(default)
cm-hwloc/1.11.11
cmake/3.18.1
cosmomc/2019-11
cuda/11.1
cuda/11.4
default-environment
fmt/7.0.3
gcc/9
gcc/10
gdb/8.2
go/1.12.7
go/1.14
go/1.15.7(default)
go/1.17.8
go/1.18
gsl/2.5
hdf5_18/1.8.20
julia/1.6.4-amd
julia/1.6.5
julia/1.6.5-amd
julia/1.7.1
julia/1.8.4
jupyter/1.0.0(default)
maple/maple18
maple/maple19
mathematica/11.0.1
mathematica/12.0
mathematica/12.1
mathematica/12.1.1
mathematica/12.2
mathematica/12.3(default)
mathematica/13.0
matlab/R2018a
miniconda2/4.5.11
miniconda2/4.6.14
miniconda2/4.8.3(default)
miniconda3/4.5.11
miniconda3/4.6.14
miniconda3/4.9.2(default)
mpfr/4.0.2
mpich/gcc-9/3.3.2
mpich/ge/gcc/64/3.3-184-cm8.2
mvapich2/gcc/64/2.3.2
nvhpc-byo-compiler/21.3
python/2.7
python/3.6
python/3.7(default)
python/3.8
python/3.9
python/3.10
rclone/1.57.0
rockstar/0.99.9-RC3
scalar_blocks/1.0.0
scalar_blocks/openmpi/1.0.0
scalar_blocks/ubuntu18.04/openmpi/1.0.0
sdpb/2.1.1-sing
sdpb/2.1.2+22
sdpb/2.1.2-native
sdpb/2.4.0
sdpb/2.4.0+1
sdpb/ubuntu-18.04(default)
sdpb/ubuntu-18.04/2.4.0(default)
sge/2011.11p1
singularity/3.0.1
singularity/3.3.0(default)
singularity/3.5.3
singularity/3.6.1-pre
singularity/3.7.1
singularity/3.8.0
slurm/19.05.8
swig/4.0.2
:
Simple
2 0
Mem: 117.41 MB
Saving completed
Terminal 2

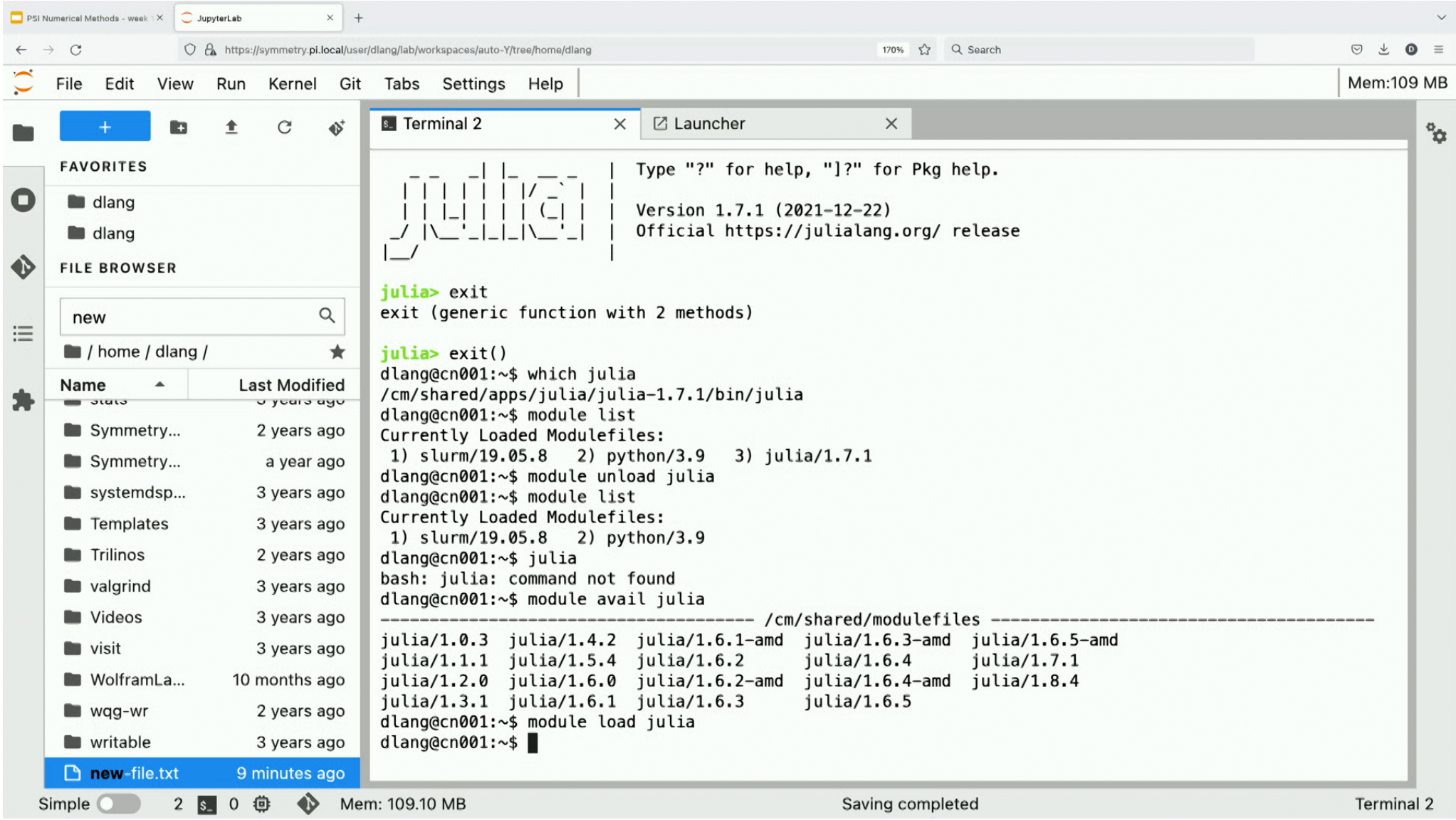

PSI Numerical Methods - week 1
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 5 minutes ago
Terminal 2
Launcher
cm-hwloc/1.11.11 mathematica/12.1 scalar_blocks/ubuntu18.04/openmpi/1.0.0
cmake/3.18.1 mathematica/12.1.1 sdpb/2.1.1-sing
cosmomc/2019-11 mathematica/12.2 sdpb/2.1.2+22
cuda/11.1 mathematica/12.3(default) sdpb/2.1.2-native
cuda/11.4 mathematica/13.0 sdpb/2.4.0
default-environment matlab/R2018a sdpb/2.4.0+1
fmt/7.0.3 miniconda2/4.5.11 sdpb/ubuntu-18.04(default)
gcc/9 miniconda2/4.6.14 sdpb/ubuntu-18.04/2.4.0(default)
gcc/10 miniconda2/4.8.3(default) sge/2011.11p1
gdb/8.2 miniconda3/4.5.11 singularity/3.0.1
go/1.12.7 miniconda3/4.6.14 singularity/3.3.0(default)
go/1.14 miniconda3/4.9.2(default) singularity/3.5.3
go/1.15.7(default) mpfr/4.0.2 singularity/3.6.1-pre
go/1.17.8 mpich/gcc-9/3.3.2 singularity/3.7.1
go/1.18 mpich/ge/gcc/64/3.3-184-cm8.2 singularity/3.8.0
gsl/2.5 mvapich2/gcc/64/2.3.2 slurm/19.05.8
hdf5_18/1.8.20 nvhpc-byo-compiler/21.3 swig/4.0.2
dlang@cn001:~$ module load julia/1.7.1
dlang@cn001:~$ julia
Documentation: https://docs.julialang.org
Type "?" for help, "]?" for Pkg help.
Version 1.7.1 (2021-12-22)
Official https://julialang.org/ release
julia>
Simple
2 0
Mem: 109.01 MB
Saving completed
Terminal 2

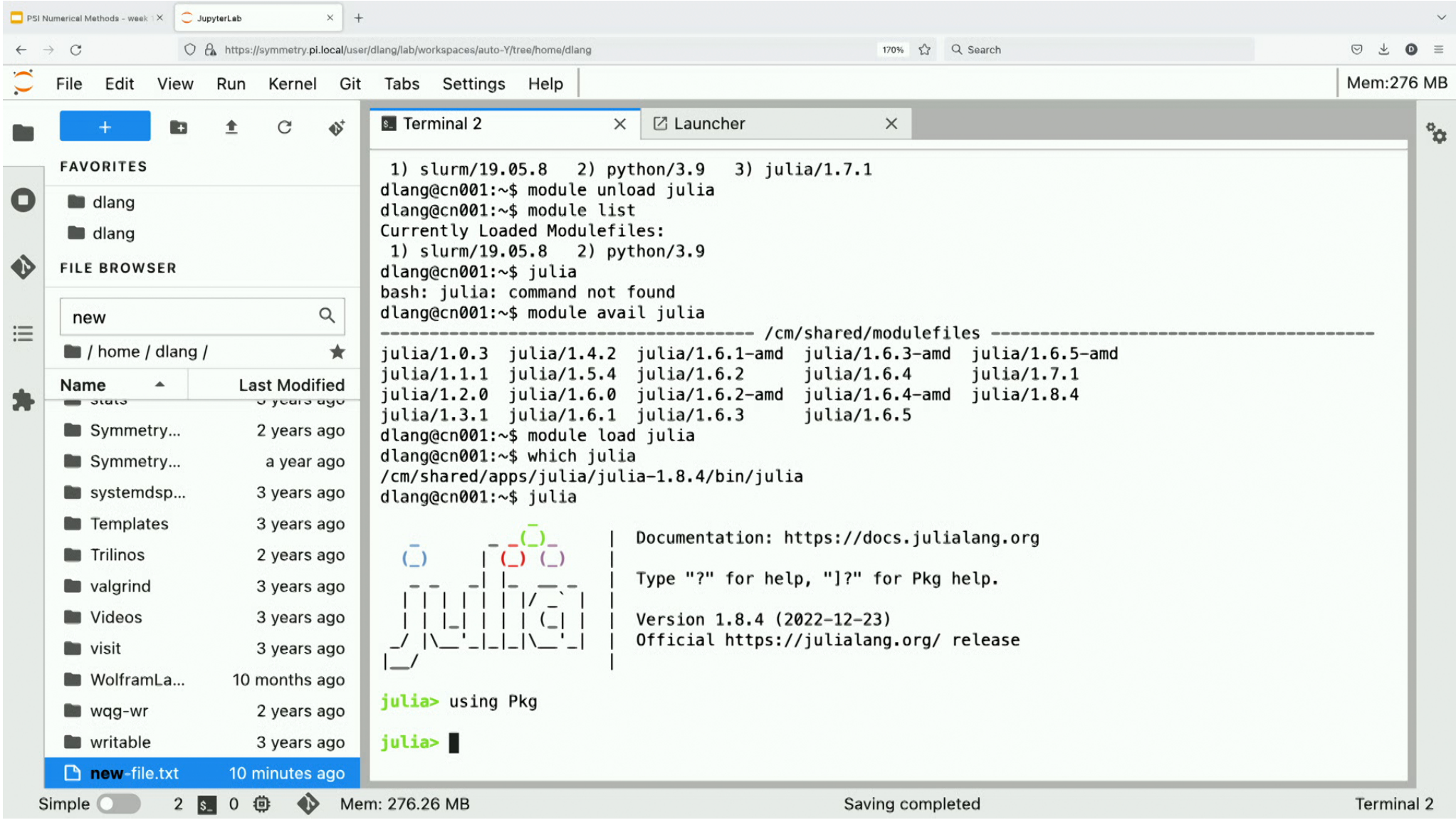

PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 6 minutes ago
Terminal 2
Launcher
cuda/11.4 mathematica/13.0 sdpb/2.4.0
default-environment matlab/R2018a sdpb/2.4.0+1
fmt/7.0.3 miniconda2/4.5.11 sdpb/ubuntu-18.04(default)
gcc/9 miniconda2/4.6.14 sdpb/ubuntu-18.04/2.4.0(default)
gcc/10 miniconda2/4.8.3(default) sge/2011.11p1
gdb/8.2 miniconda3/4.5.11 singularity/3.0.1
go/1.12.7 miniconda3/4.6.14 singularity/3.3.0(default)
go/1.14 miniconda3/4.9.2(default) singularity/3.5.3
go/1.15.7(default) mpfr/4.0.2 singularity/3.6.1-pre
go/1.17.8 mpich/gcc-9/3.3.2 singularity/3.7.1
go/1.18 mpich/ge/gcc/64/3.3-184-cm8.2 singularity/3.8.0
gsl/2.5 mvapich2/gcc/64/2.3.2 slurm/19.05.8
hdf5_18/1.8.20 nvhpc-byo-compiler/21.3 swig/4.0.2
dlang@cn001:~$ module load julia/1.7.1
dlang@cn001:~$ julia
Documentation: https://docs.julialang.org
Type "?" for help, "]?" for Pkg help.
Version 1.7.1 (2021-12-22)
Official https://julialang.org/ release
julia> exit
exit (generic function with 2 methods)
julia> exit()
dlang@cn001:~$
Simple
2 0
Mem: 109.09 MB
Saving completed
Terminal 2

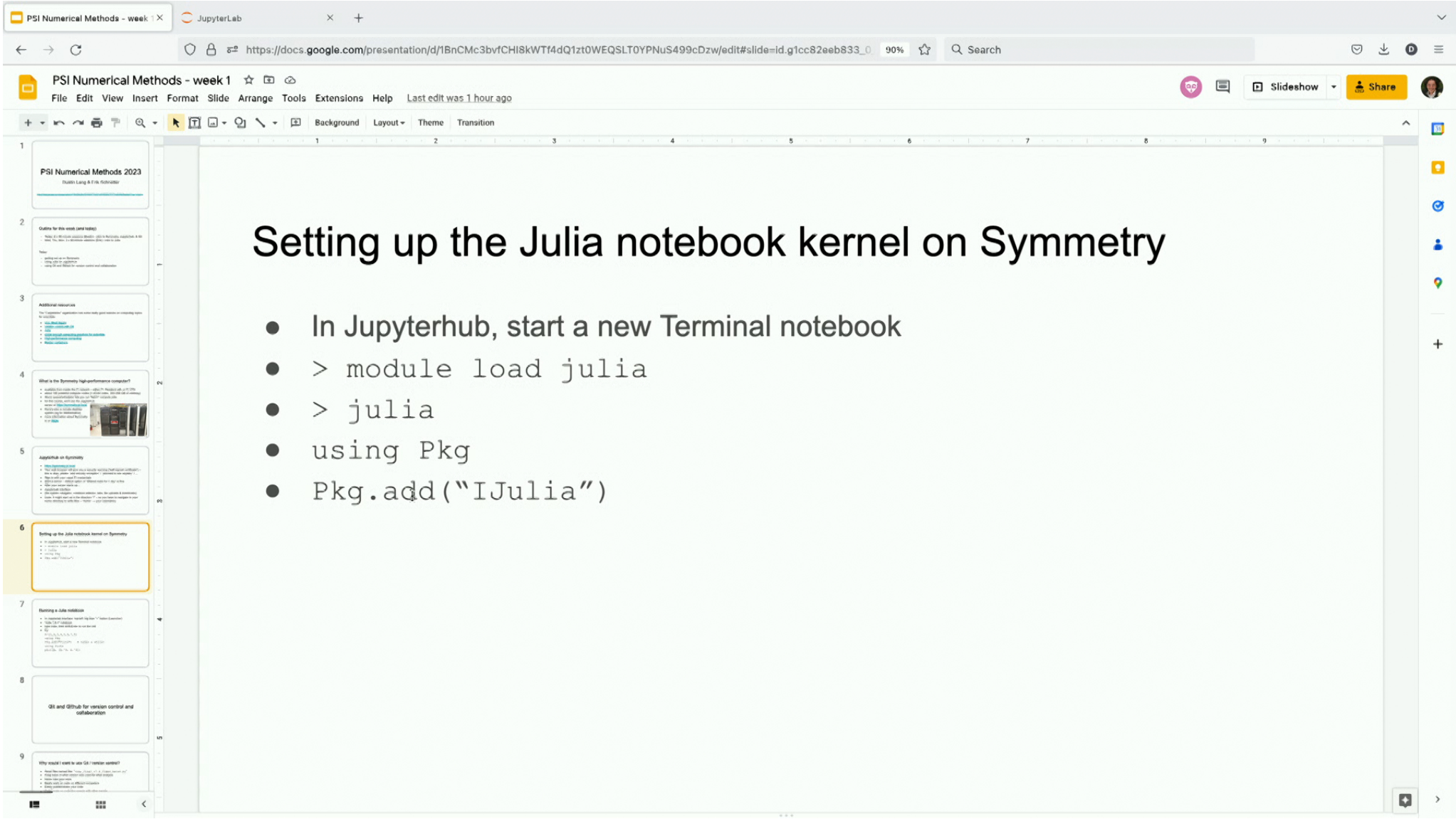

PSI Numerical Methods - week 1
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 7 minutes ago
Terminal 2
Launcher
cuda/11.4 mathematica/13.0 sdpb/2.4.0
default-environment matlab/R2018a sdpb/2.4.0+1
fmt/7.0.3 miniconda2/4.5.11 sdpb/ubuntu-18.04(default)
gcc/9 miniconda2/4.6.14 sdpb/ubuntu-18.04/2.4.0(default)
gcc/10 miniconda2/4.8.3(default) sge/2011.11p1
gdb/8.2 miniconda3/4.5.11 singularity/3.0.1
go/1.12.7 miniconda3/4.6.14 singularity/3.3.0(default)
go/1.14 miniconda3/4.9.2(default) singularity/3.5.3
go/1.15.7(default) mpfr/4.0.2 singularity/3.6.1-pre
go/1.17.8 mpich/gcc-9/3.3.2 singularity/3.7.1
go/1.18 mpich/ge/gcc/64/3.3-184-cm8.2 singularity/3.8.0
gsl/2.5 mvapich2/gcc/64/2.3.2 slurm/19.05.8
hdf5_18/1.8.20 nvhpc-byo-compiler/21.3 swig/4.0.2
dlang@cn001:~$ module load julia/1.7.1
dlang@cn001:~$ julia
Documentation: https://docs.julialang.org
Type "?" for help, "]?" for Pkg help.
Version 1.7.1 (2021-12-22)
Official https://julialang.org/ release
julia> exit
exit (generic function with 2 methods)
julia> exit()
dlang@cn001:~$ which julia
Simple
2
0
Mem: 109.09 MB
Saving completed
Terminal 2

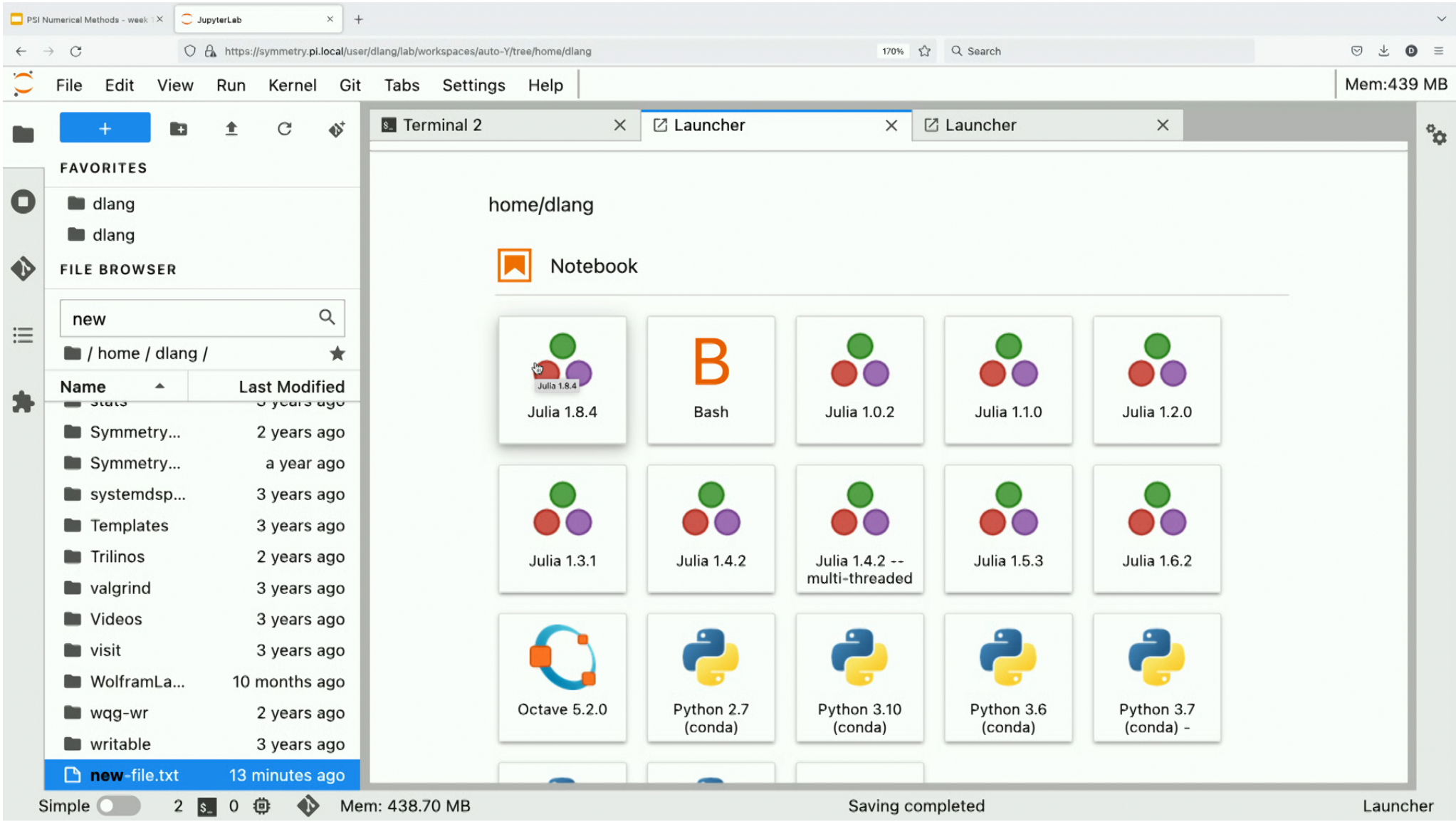

PSI Numerical Methods - week 1
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 7 minutes ago
Terminal 2
Launcher
fmt/7.0.3 miniconda2/4.5.11 sdpb/ubuntu-18.04(default)
gcc/9 miniconda2/4.6.14 sdpb/ubuntu-18.04/2.4.0(default)
gcc/10 miniconda2/4.8.3(default) sge/2011.11p1
gdb/8.2 miniconda3/4.5.11 singularity/3.0.1
go/1.12.7 miniconda3/4.6.14 singularity/3.3.0(default)
go/1.14 miniconda3/4.9.2(default) singularity/3.5.3
go/1.15.7(default) mpfr/4.0.2 singularity/3.6.1-pre
go/1.17.8 mpich/gcc-9/3.3.2 singularity/3.7.1
go/1.18 mpich/ge/gcc/64/3.3-184-cm8.2 singularity/3.8.0
gsl/2.5 mvapich2/gcc/64/2.3.2 slurm/19.05.8
hdf5_18/1.8.20 nvhpc-byo-compiler/21.3 swig/4.0.2
dlang@cn001:~$ module load julia/1.7.1
dlang@cn001:~$ julia
Documentation: https://docs.julialang.org
Type "?" for help, "]?" for Pkg help.
Version 1.7.1 (2021-12-22)
Official https://julialang.org/ release
julia> exit
exit (generic function with 2 methods)
julia> exit()
dlang@cn001:~$ which julia
/cm/shared/apps/julia/julia-1.7.1/bin/julia
dlang@cn001:~$
Simple
2
0
Mem: 109.09 MB
Saving completed
Terminal 2

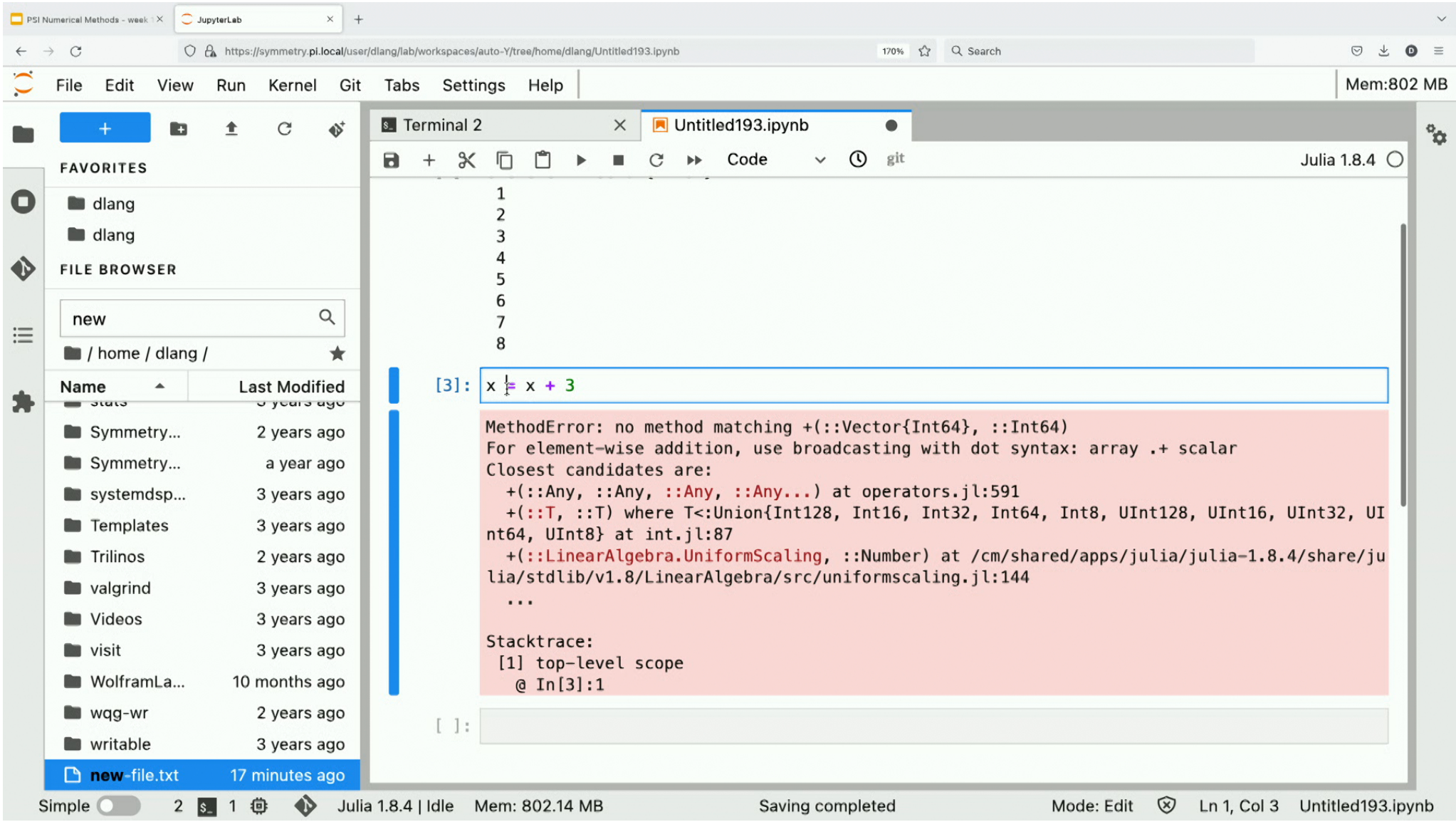

PSI Numerical Methods - week 1
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 8 minutes ago
Terminal 2
Launcher
gdb/8.2 miniconda3/4.5.11 singularity/3.0.1
go/1.12.7 miniconda3/4.6.14 singularity/3.3.0(default)
go/1.14 miniconda3/4.9.2(default) singularity/3.5.3
go/1.15.7(default) mpfr/4.0.2 singularity/3.6.1-pre
go/1.17.8 mpich/gcc-9/3.3.2 singularity/3.7.1
go/1.18 mpich/ge/gcc/64/3.3-184-cm8.2 singularity/3.8.0
gsl/2.5 mvapich2/gcc/64/2.3.2 slurm/19.05.8
hdf5_18/1.8.20 nvhpc-byo-compiler/21.3 swig/4.0.2
dlang@cn001:~$ module load julia/1.7.1
dlang@cn001:~$ julia
Documentation: https://docs.julialang.org
Type "?" for help, "]?" for Pkg help.
Version 1.7.1 (2021-12-22)
Official https://julialang.org/ release
julia> exit
exit (generic function with 2 methods)
julia> exit()
dlang@cn001:~$ which julia
/cm/shared/apps/julia/julia-1.7.1/bin/julia
dlang@cn001:~$ module list
Currently Loaded Modulefiles:
1) slurm/19.05.8 2) python/3.9 3) julia/1.7.1
dlang@cn001:~$
Simple
2 0
Mem: 109.02 MB
Saving completed
Terminal 2

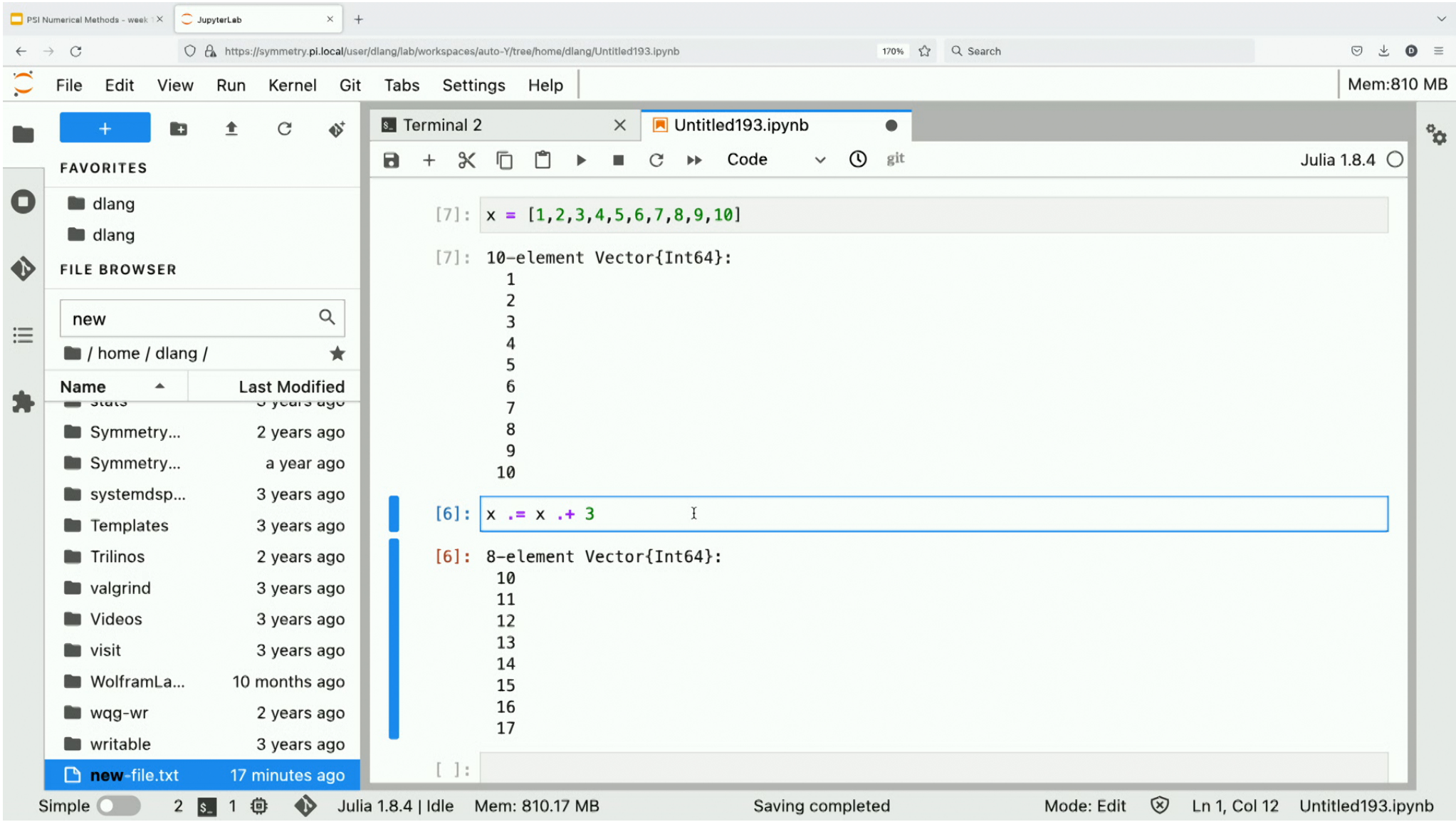

PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:109 MB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 9 minutes ago
Terminal 2
Launcher
Type "?" for help, "]?" for Pkg help.
Version 1.7.1 (2021-12-22)
Official https://julialang.org/ release
julia> exit
exit (generic function with 2 methods)
julia> exit()
dlang@cn001:~$ which julia
/cm/shared/apps/julia/julia-1.7.1/bin/julia
dlang@cn001:~$ module list
Currently Loaded Modulefiles:
1) slurm/19.05.8 2) python/3.9 3) julia/1.7.1
dlang@cn001:~$ module unload julia
dlang@cn001:~$ module list
Currently Loaded Modulefiles:
1) slurm/19.05.8 2) python/3.9
dlang@cn001:~$ julia
bash: julia: command not found
dlang@cn001:~$ module avail julia
/cm/shared/modulefiles
julia/1.0.3 julia/1.4.2 julia/1.6.1-amd julia/1.6.3-amd julia/1.6.5-amd
julia/1.1.1 julia/1.5.4 julia/1.6.2 julia/1.6.4 julia/1.7.1
julia/1.2.0 julia/1.6.0 julia/1.6.2-amd julia/1.6.4-amd julia/1.8.4
julia/1.3.1 julia/1.6.1 julia/1.6.3 julia/1.6.5
dlang@cn001:~$ module load julia
dlang@cn001:~$
Simple
2 0
Mem: 109.10 MB
Saving completed
Terminal 2

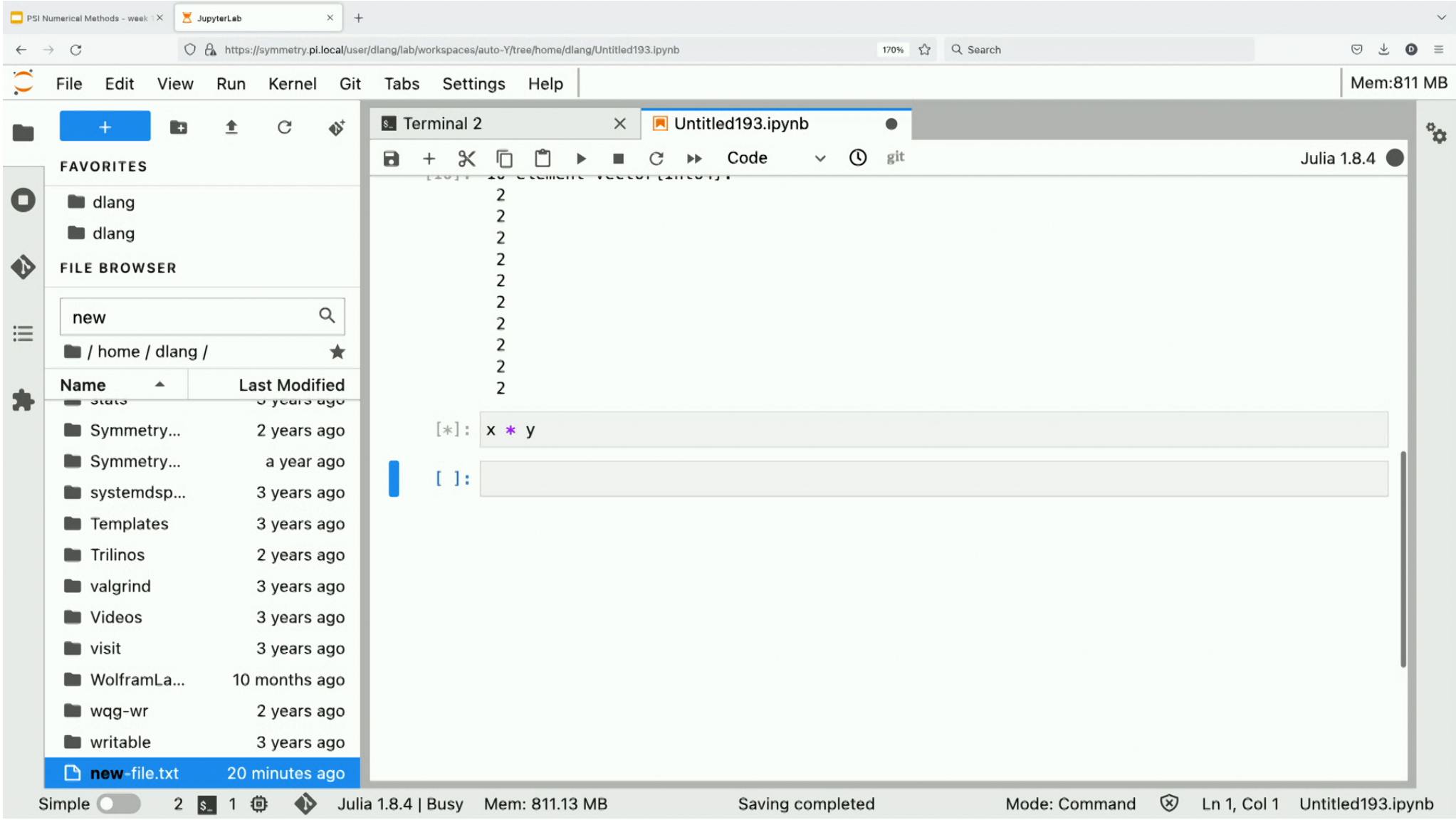

PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:276 MB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 10 minutes ago
Terminal 2
Launcher
1) slurm/19.05.8 2) python/3.9 3) julia/1.7.1
dlang@cn001:~$ module unload julia
dlang@cn001:~$ module list
Currently Loaded Modulefiles:
1) slurm/19.05.8 2) python/3.9
dlang@cn001:~$ julia
bash: julia: command not found
dlang@cn001:~$ module avail julia
/cm/shared/modulefiles
julia/1.0.3 julia/1.4.2 julia/1.6.1-amd julia/1.6.3-amd julia/1.6.5-amd
julia/1.1.1 julia/1.5.4 julia/1.6.2 julia/1.6.4 julia/1.7.1
julia/1.2.0 julia/1.6.0 julia/1.6.2-amd julia/1.6.4-amd julia/1.8.4
julia/1.3.1 julia/1.6.1 julia/1.6.3 julia/1.6.5
dlang@cn001:~$ module load julia
dlang@cn001:~$ which julia
/cm/shared/apps/julia/julia-1.8.4/bin/julia
dlang@cn001:~$ julia
Documentation: https://docs.julialang.org
Type "?" for help, "]?" for Pkg help.
Version 1.8.4 (2022-12-23)
Official https://julialang.org/ release
julia> using Pkg
julia>
Simple
2 0
Mem: 276.26 MB
Saving completed
Terminal 2

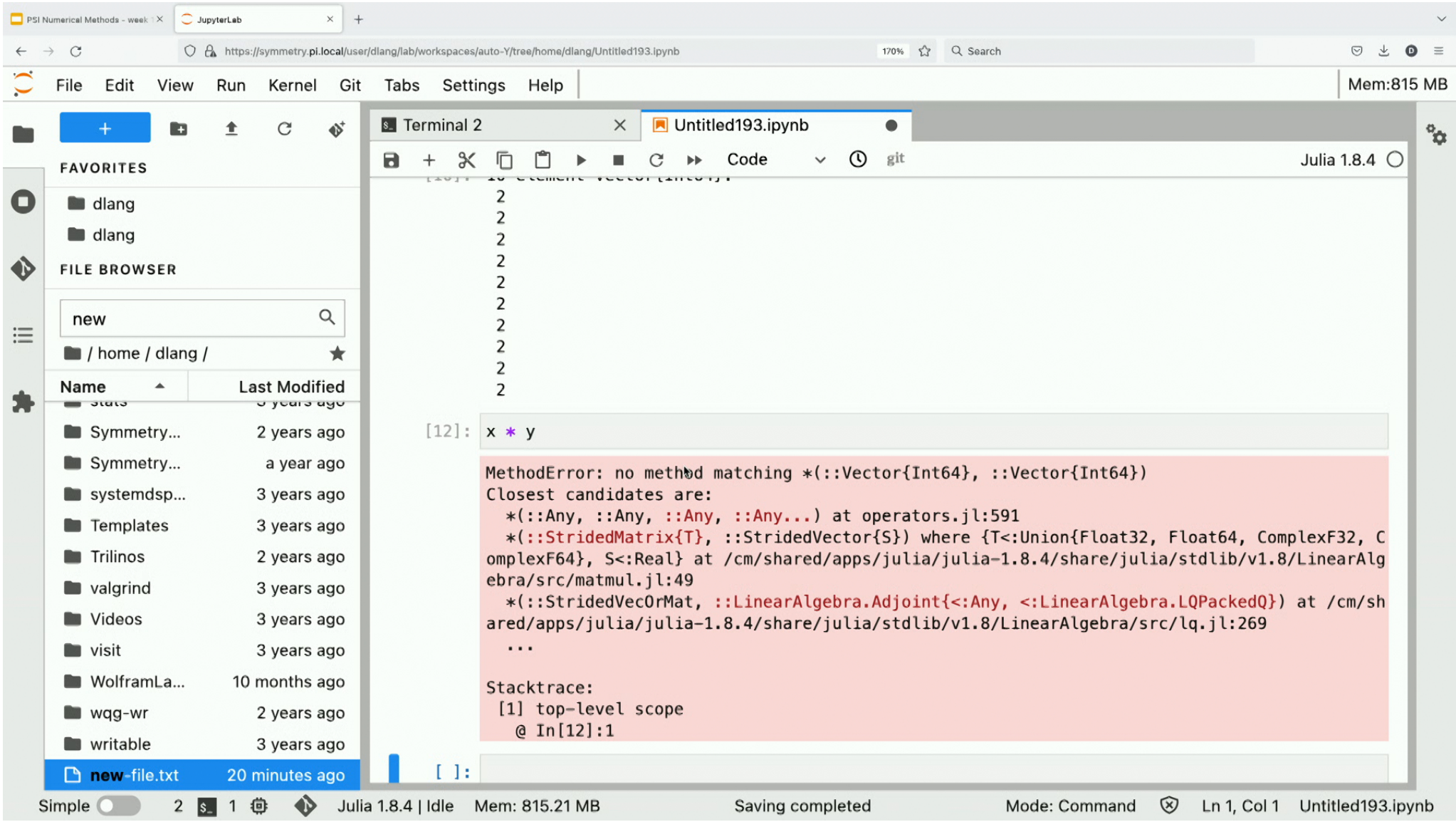

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https://docs.google.com/presentation/d/1BnCMc3bvfCHI8kWTf4dQ1zt0WEQSLT0YPNuS499cDzw/edit#slide=id.g1cc82eeb833_0
90%
Search
PSI Numerical Methods - week 1
File Edit View Insert Format Slide Arrange Tools Extensions Help
Last edit was 1 hour ago
Slideshow
Share
Background
Layout
Theme
Transition
Setting up the Julia notebook kernel on Symmetry
In Jupyterhub, start a new Terminal notebook
> module load julia
> julia
using Pkg
Pkg.add("IJulia")

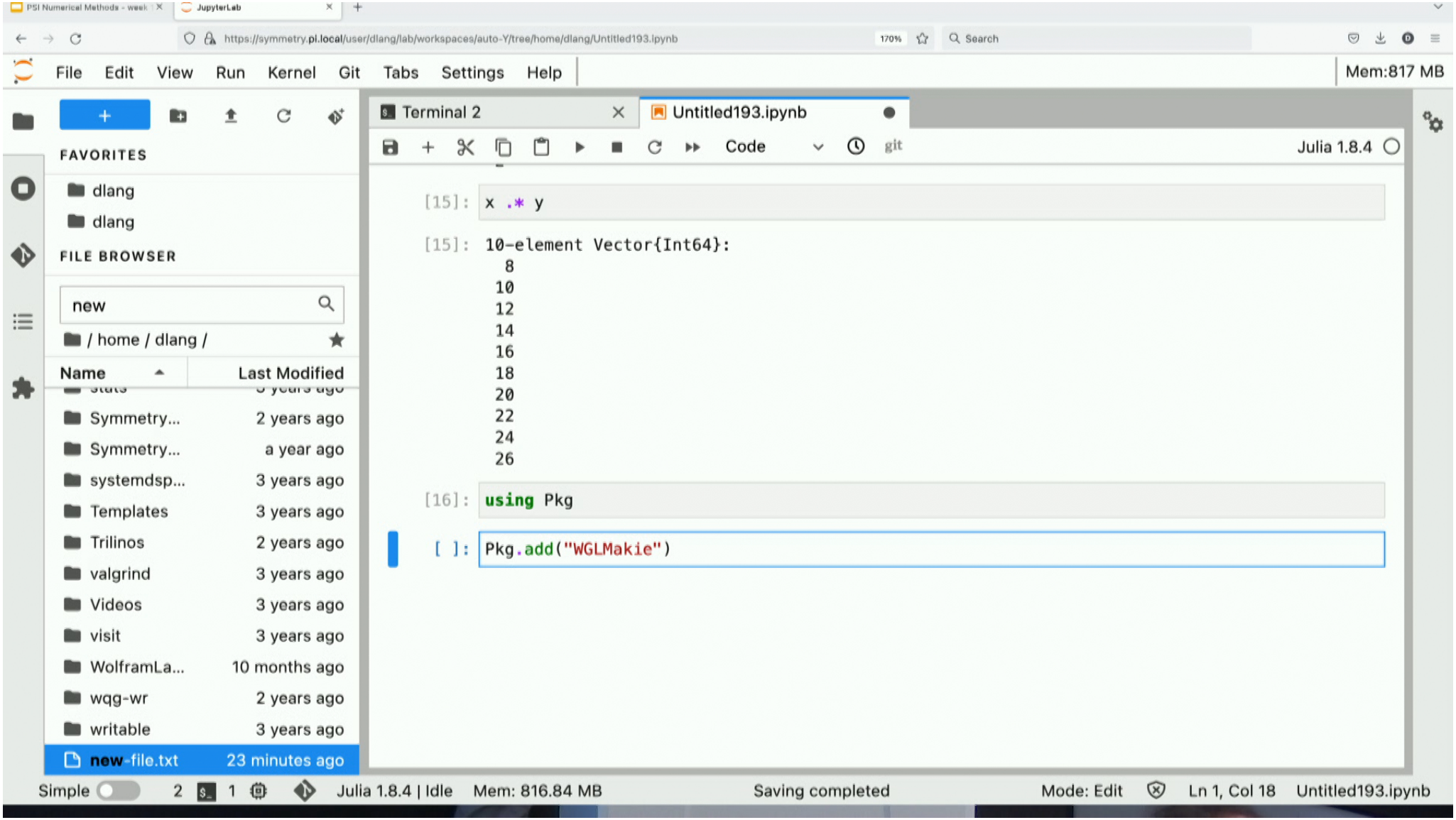

PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:439 MB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 13 minutes ago
Terminal 2
Launcher
Launcher
home/dlang
Notebook
Julia 1.8.4
Bash
Julia 1.0.2
Julia 1.1.0
Julia 1.2.0
Julia 1.3.1
Julia 1.4.2
Julia 1.4.2 -- multi-threaded
Julia 1.5.3
Julia 1.6.2
Octave 5.2.0
Python 2.7 (conda)
Python 3.10 (conda)
Python 3.6 (conda)
Python 3.7 (conda) -
Simple
2
0
Mem: 438.70 MB
Saving completed
Launcher

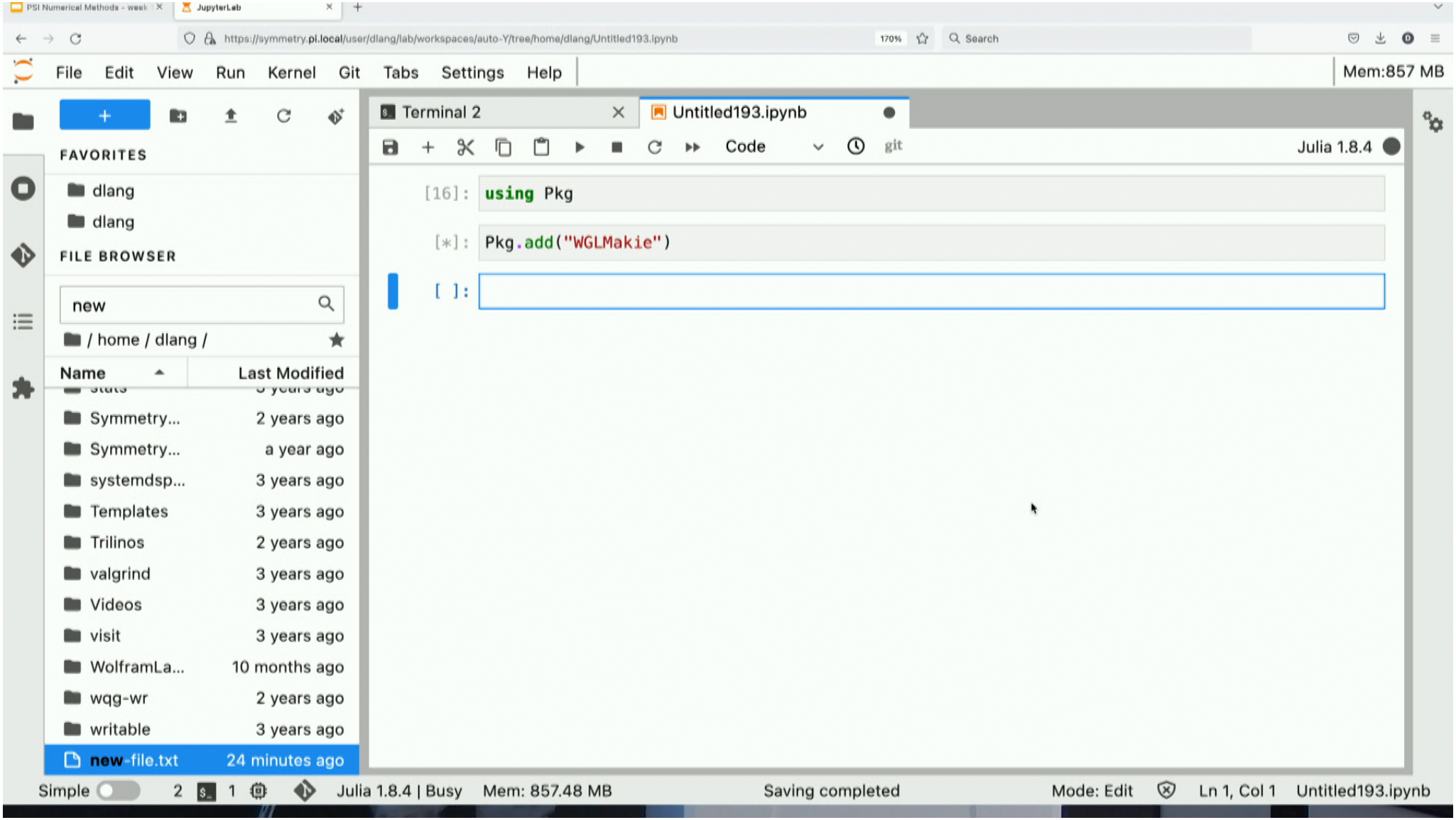

PSI Numerical Methods - week 1
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang/Untitled193.ipynb
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:802 MB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 17 minutes ago
Terminal 2
Untitled193.ipynb
Code
git
Julia 1.8.4
1
2
3
4
5
6
7
8
[3]: x += x + 3
MethodError: no method matching +(::Vector{Int64}, ::Int64)
For element-wise addition, use broadcasting with dot syntax: array .+ scalar
Closest candidates are:
+(::Any, ::Any, ::Any, ::Any...) at operators.jl:591
+(::T, ::T) where T<:Union{Int128, Int16, Int32, Int64, Int8, UInt128, UInt16, UInt32, UInt64, UInt8} at int.jl:87
+(::LinearAlgebra.UniformScaling, ::Number) at /cm/shared/apps/julia/julia-1.8.4/share/julia/stdlib/v1.8/LinearAlgebra/src/uniformscaling.jl:144
...
Stacktrace:
[1] top-level scope
@ In[3]:1
[ ]:
Simple
2
1
Julia 1.8.4 | Idle
Mem: 802.14 MB
Saving completed
Mode: Edit
Ln 1, Col 3
Untitled193.ipynb

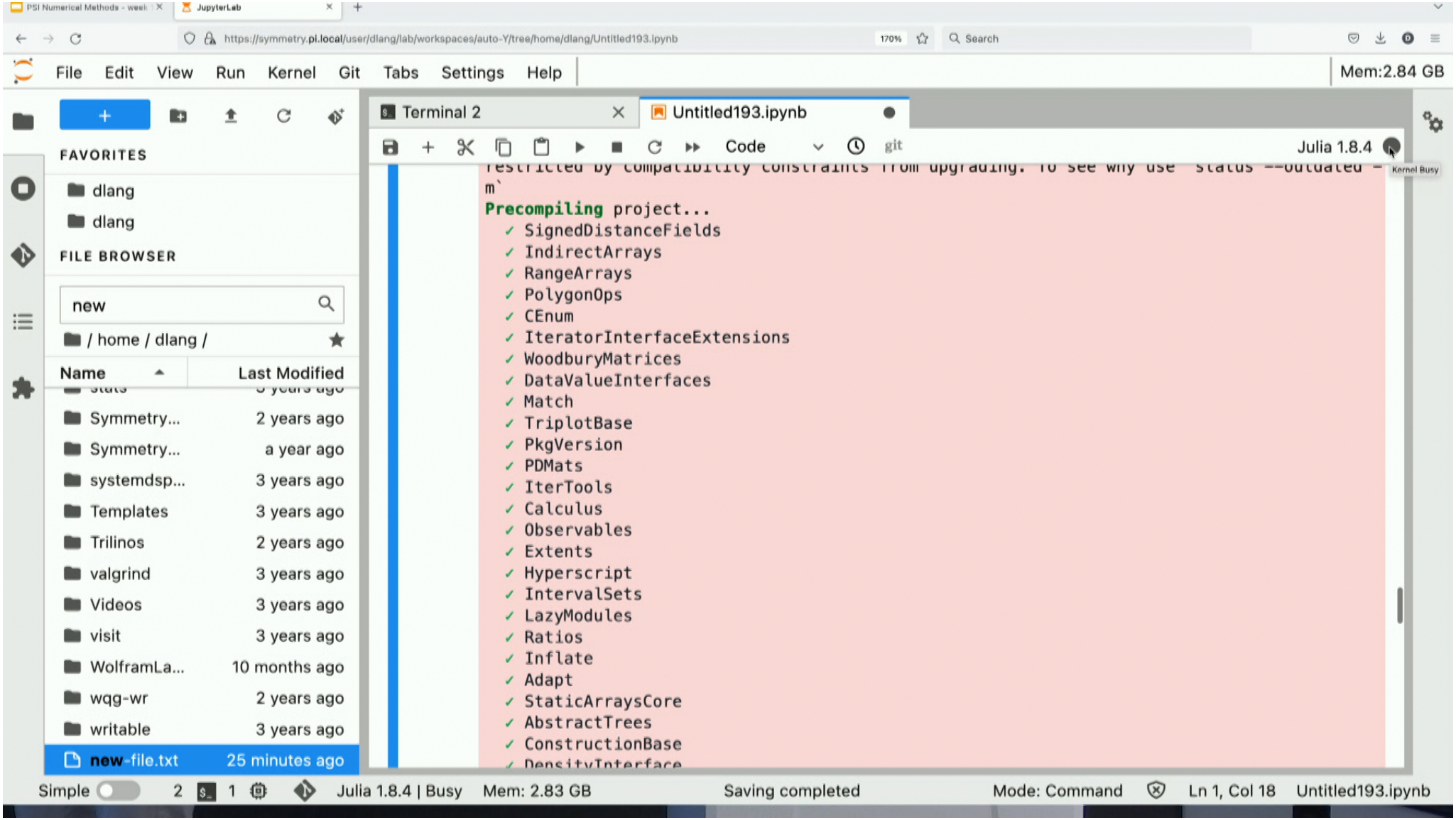

PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang/Untitled193.ipynb
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:810 MB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 17 minutes ago
Terminal 2
Untitled193.ipynb
Code
git
Julia 1.8.4
[7]: x = [1,2,3,4,5,6,7,8,9,10]
[7]: 10-element Vector{Int64}:
1
2
3
4
5
6
7
8
9
10
[6]: x .= x .+ 3
[6]: 8-element Vector{Int64}:
10
11
12
13
14
15
16
17
[ ]:
Simple
2
1
Julia 1.8.4 | Idle
Mem: 810.17 MB
Saving completed
Mode: Edit
Ln 1, Col 12
Untitled193.ipynb

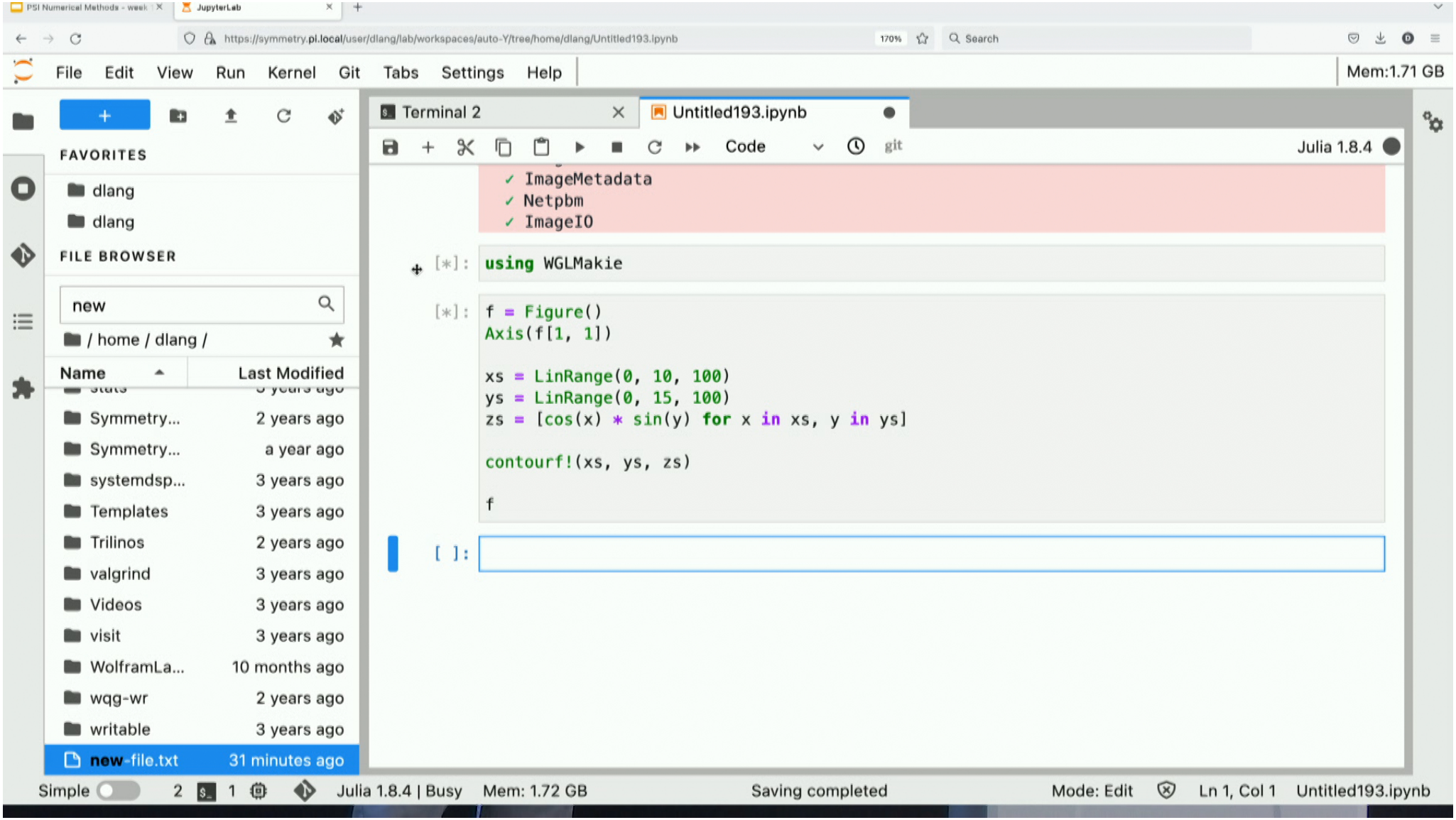

PSI Numerical Methods - week
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang/Untitled193.ipynb
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:811 MB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 20 minutes ago
Terminal 2
Untitled193.ipynb
Code
git
Julia 1.8.4
2
2
2
2
2
2
2
2
2
2
[*]: x * y
[ ]:
Simple
2
1
Julia 1.8.4 | Busy
Mem: 811.13 MB
Saving completed
Mode: Command
Ln 1, Col 1
Untitled193.ipynb

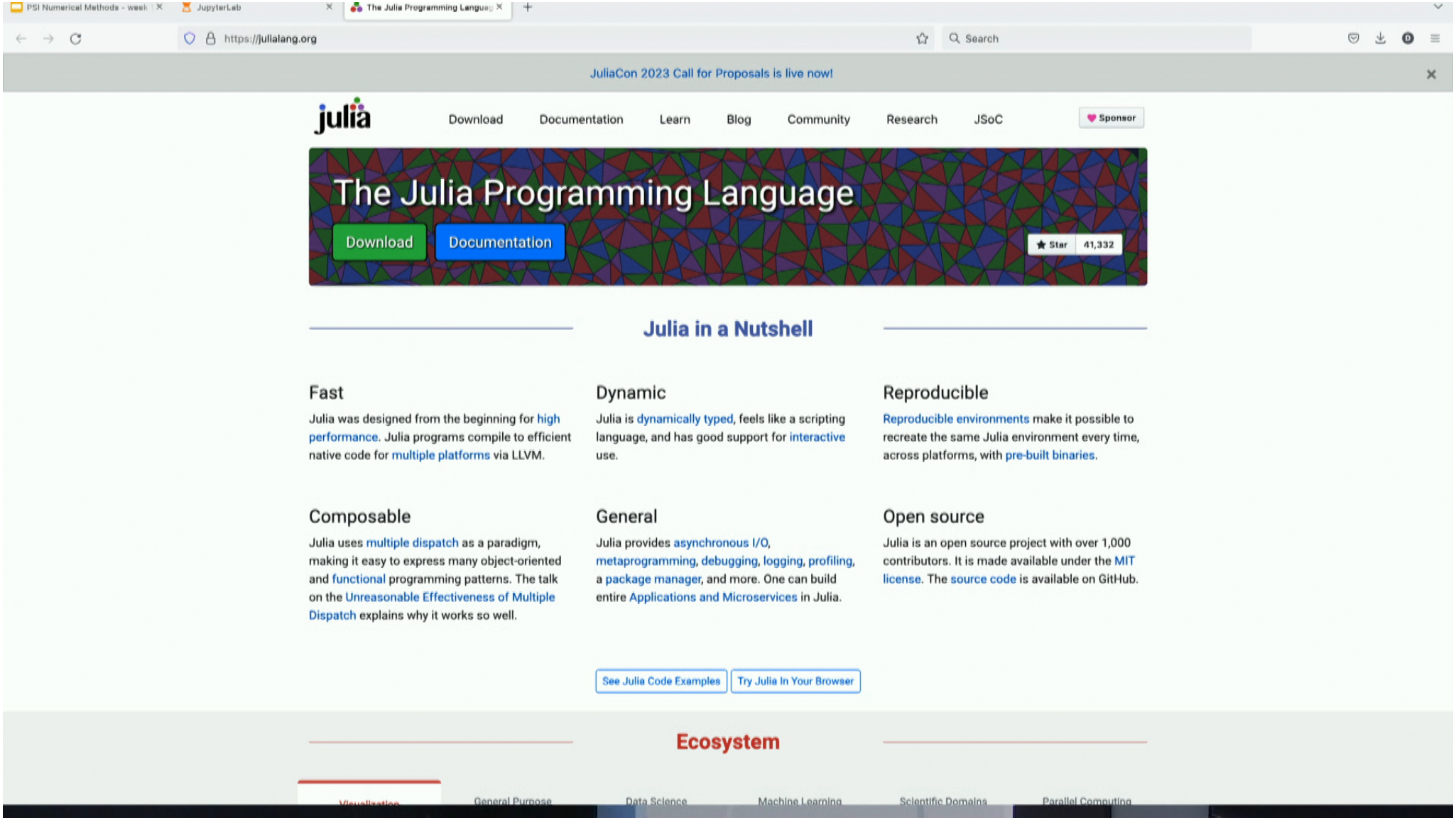

PSI Numerical Methods - week 1
JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang/Untitled193.ipynb
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:815 MB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 20 minutes ago
Terminal 2
Untitled193.ipynb
Code
git
Julia 1.8.4
2
2
2
2
2
2
2
2
2
2
[12]: x * y
MethodError: no method matching *(::Vector{Int64}, ::Vector{Int64})
Closest candidates are:
*(::Any, ::Any, ::Any, ::Any...) at operators.jl:591
*(::StridedMatrix{T}, ::StridedVector{S}) where {T<:Union{Float32, Float64, ComplexF32, ComplexF64}, S<:Real} at /cm/shared/apps/julia/julia-1.8.4/share/julia/stdlib/v1.8/LinearAlgebra/src/matmul.jl:49
*(::StridedVecOrMat, ::LinearAlgebra.Adjoint{<:Any, <:LinearAlgebra.LQPackedQ}) at /cm/shared/apps/julia/julia-1.8.4/share/julia/stdlib/v1.8/LinearAlgebra/src/lq.jl:269
...
Stacktrace:
[1] top-level scope
@ In[12]:1
[ ]:
Simple
2
1
Julia 1.8.4 | Idle
Mem: 815.21 MB
Saving completed
Mode: Command
Ln 1, Col 1
Untitled193.ipynb

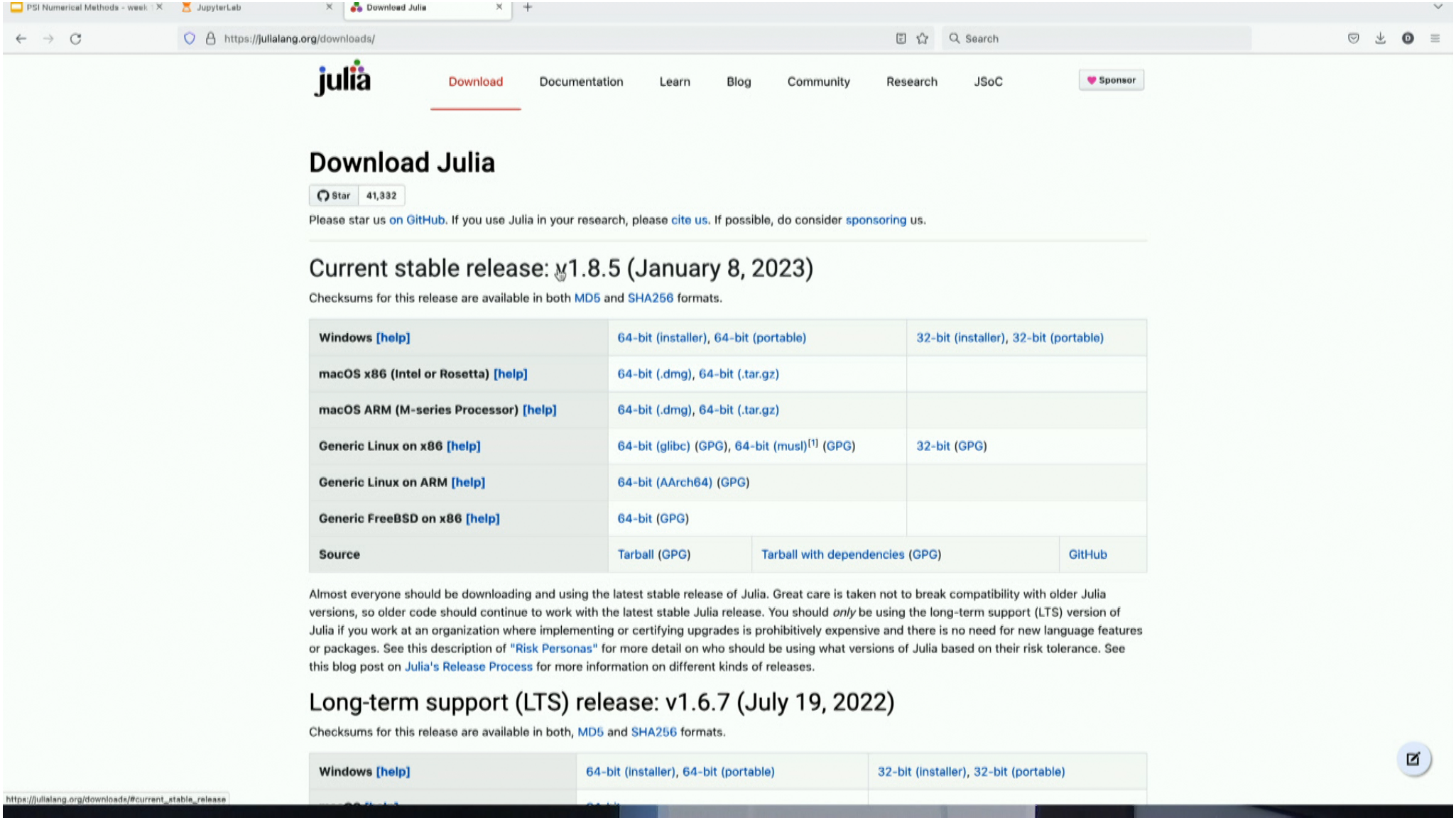

JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang/Untitled193.ipynb
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:817 MB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 23 minutes ago
Terminal 2
Untitled193.ipynb
Code
git
Julia 1.8.4
[15]: x .* y
[15]: 10-element Vector{Int64}:
8
10
12
14
16
18
20
22
24
26
[16]: using Pkg
[ ]: Pkg.add("WGLMakie")
Simple
Julia 1.8.4 | Idle
Mem: 816.84 MB
Saving completed
Mode: Edit
Ln 1, Col 18
Untitled193.ipynb

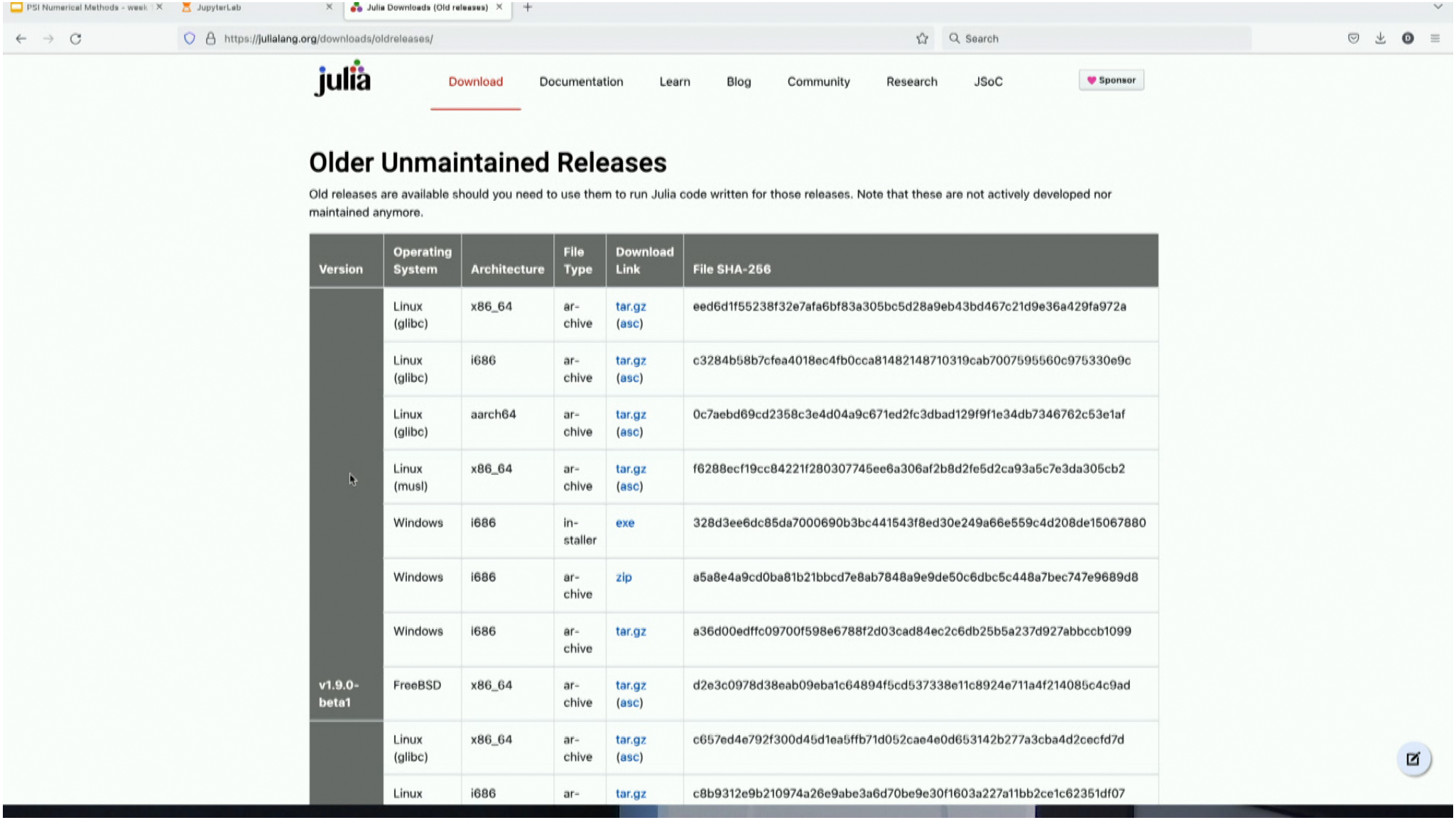

JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang/Untitled193.ipynb
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:857 MB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 24 minutes ago
Terminal 2
Untitled193.ipynb
Code
git
Julia 1.8.4
[16]: using Pkg
[*]: Pkg.add("WGLMakie")
[ ]:
Simple
Julia 1.8.4 | Busy
Mem: 857.48 MB
Saving completed
Mode: Edit
Ln 1, Col 1
Untitled193.ipynb

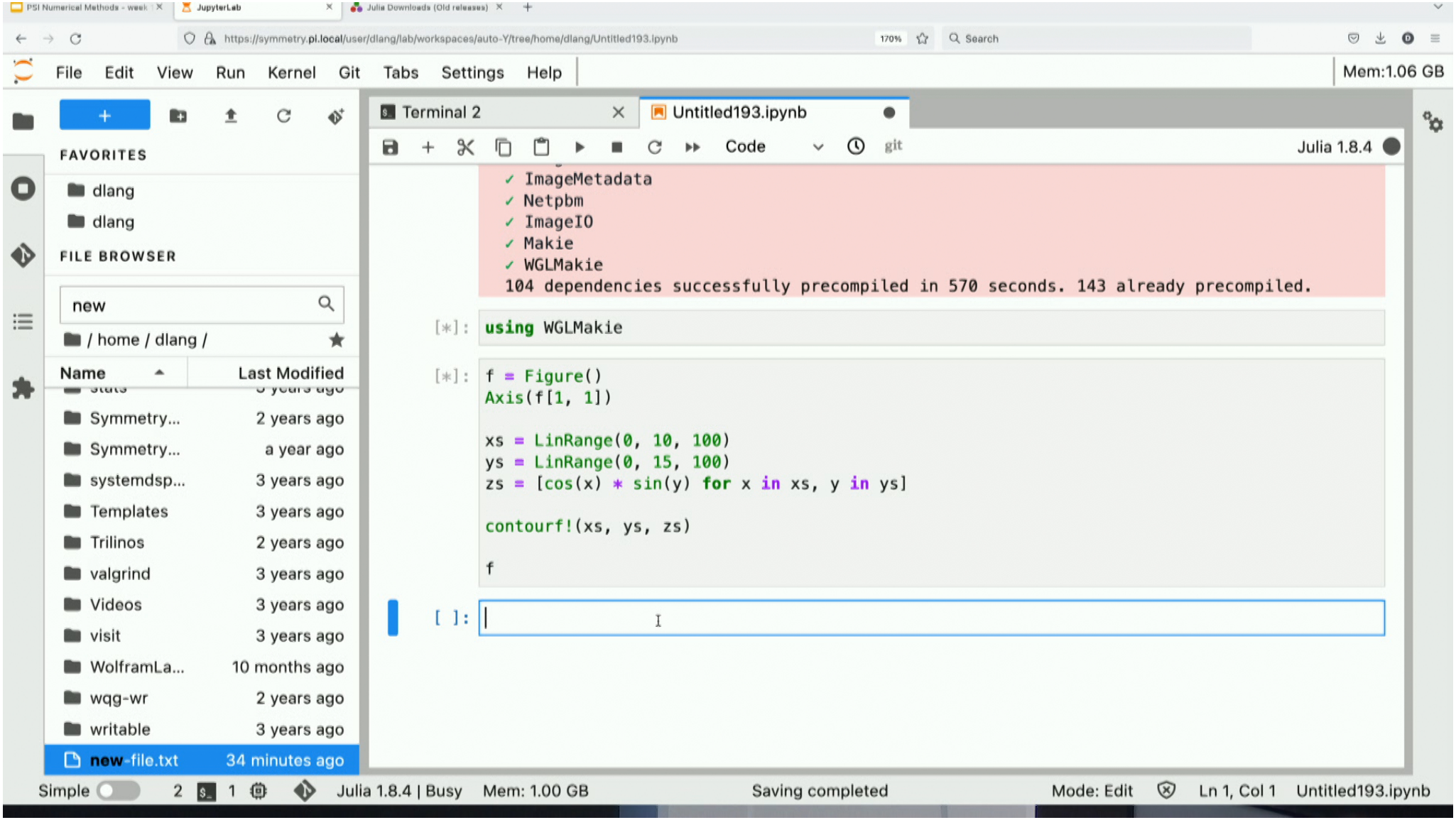

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https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang/Untitled193.ipynb
170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:2.84 GB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 25 minutes ago
Terminal 2
Untitled193.ipynb
Code
git
Julia 1.8.4
Kernel Busy
restricted by compatibility constraints from upgrading. To see why use `status --outdated -m`
Precompiling project...
✓ SignedDistanceFields
✓ IndirectArrays
✓ RangeArrays
✓ PolygonOps
✓ CEnum
✓ IteratorInterfaceExtensions
✓ WoodburyMatrices
✓ DataValueInterfaces
✓ Match
✓ TriplotBase
✓ PkgVersion
✓ PDMats
✓ IterTools
✓ Calculus
✓ Observables
✓ Extents
✓ Hyperscript
✓ IntervalSets
✓ LazyModules
✓ Ratios
✓ Inflate
✓ Adapt
✓ StaticArraysCore
✓ AbstractTrees
✓ ConstructionBase
✓ DensityInterface
Simple
2
1
Julia 1.8.4 | Busy
Mem: 2.83 GB
Saving completed
Mode: Command
Ln 1, Col 18
Untitled193.ipynb


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170%
Search
File Edit View Run Kernel Git Tabs Settings Help
Mem:1.71 GB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 31 minutes ago
Terminal 2
Untitled193.ipynb
Code
git
Julia 1.8.4
✓ ImageMetadata
✓ Netpbm
✓ ImageIO
[*]: using WGLMakie
[*]: f = Figure()
Axis(f[1, 1])
xs = LinRange(0, 10, 100)
ys = LinRange(0, 15, 100)
zs = [cos(x) * sin(y) for x in xs, y in ys]
contourf!(xs, ys, zs)
f
[ ]:
Simple
2
1
Julia 1.8.4 | Busy
Mem: 1.72 GB
Saving completed
Mode: Edit
Ln 1, Col 1
Untitled193.ipynb


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Julia in a Nutshell
Fast
Julia was designed from the beginning for high performance. Julia programs compile to efficient native code for multiple platforms via LLVM.
Dynamic
Julia is dynamically typed, feels like a scripting language, and has good support for interactive use.
Reproducible
Reproducible environments make it possible to recreate the same Julia environment every time, across platforms, with pre-built binaries.
Composable
Julia uses multiple dispatch as a paradigm, making it easy to express many object-oriented and functional programming patterns. The talk on the Unreasonable Effectiveness of Multiple Dispatch explains why it works so well.
General
Julia provides asynchronous I/O, metaprogramming, debugging, logging, profiling, a package manager, and more. One can build entire Applications and Microservices in Julia.
Open source
Julia is an open source project with over 1,000 contributors. It is made available under the MIT license. The source code is available on GitHub.
See Julia Code Examples
Try Julia In Your Browser
Ecosystem
General Purpose
Data Science
Machine Learning
Scientific Domains
Parallel Computing


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Please star us on GitHub. If you use Julia in your research, please cite us. If possible, do consider sponsoring us.
Current stable release: v1.8.5 (January 8, 2023)
Checksums for this release are available in both MD5 and SHA256 formats.
Windows [help] | 64-bit (installer), 64-bit (portable) | 32-bit (installer), 32-bit (portable)
macOS x86 (Intel or Rosetta) [help] | 64-bit (.dmg), 64-bit (.tar.gz)
macOS ARM (M-series Processor) [help] | 64-bit (.dmg), 64-bit (.tar.gz)
Generic Linux on x86 [help] | 64-bit (glibc) (GPG), 64-bit (musl)[1] (GPG) | 32-bit (GPG)
Generic Linux on ARM [help] | 64-bit (AArch64) (GPG)
Generic FreeBSD on x86 [help] | 64-bit (GPG)
Source | Tarball (GPG) | Tarball with dependencies (GPG) | GitHub
Almost everyone should be downloading and using the latest stable release of Julia. Great care is taken not to break compatibility with older Julia versions, so older code should continue to work with the latest stable Julia release. You should only be using the long-term support (LTS) version of Julia if you work at an organization where implementing or certifying upgrades is prohibitively expensive and there is no need for new language features or packages. See this description of "Risk Personas" for more detail on who should be using what versions of Julia based on their risk tolerance. See this blog post on Julia's Release Process for more information on different kinds of releases.
Long-term support (LTS) release: v1.6.7 (July 19, 2022)
Checksums for this release are available in both, MD5 and SHA256 formats.
Windows [help] | 64-bit (installer), 64-bit (portable) | 32-bit (installer), 32-bit (portable)
https://julialang.org/downloads/#current_stable_release


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Sponsor
Older Unmaintained Releases
Old releases are available should you need to use them to run Julia code written for those releases. Note that these are not actively developed nor maintained anymore.
Version
Operating System
Architecture
File Type
Download Link
File SHA-256
Linux (glibc)
x86_64
ar-chive
tar.gz (asc)
eed6d1f55238f32e7afa6bf83a305bc5d28a9eb43bd467c21d9e36a429fa972a
Linux (glibc)
i686
ar-chive
tar.gz (asc)
c3284b58b7cfea4018ec4fb0cca81482148710319cab7007595560c975330e9c
Linux (glibc)
aarch64
ar-chive
tar.gz (asc)
0c7aebd69cd2358c3e4d04a9c671ed2fc3dbad129f9f1e34db7346762c53e1af
Linux (musl)
x86_64
ar-chive
tar.gz (asc)
f6288ecf19cc84221f280307745ee6a306af2b8d2fe5d2ca93a5c7e3da305cb2
Windows
i686
in-staller
exe
328d3ee6dc85da7000690b3bc441543f8ed30e249a66e559c4d208de15067880
Windows
i686
ar-chive
zip
a5a8e4a9cd0ba81b21bbcd7e8ab7848a9e9de50c6dbc5c448a7bec747e9689d8
Windows
i686
ar-chive
tar.gz
a36d00edffc09700f598e6788f2d03cad84ec2c6db25b5a237d927abbccb1099
v1.9.0-beta1
FreeBSD
x86_64
ar-chive
tar.gz (asc)
d2e3c0978d38eab09eba1c64894f5cd537338e11c8924e711a4f214085c4c9ad
Linux (glibc)
x86_64
ar-chive
tar.gz (asc)
c657ed4e792f300d45d1ea5ffb71d052cae4e0d653142b277a3cba4d2cecfd7d
Linux
i686
ar-
tar.gz
c8b9312e9b210974a26e9abe3a6d70be9e30f1603a227a11bb2ce1c62351df07


JupyterLab
https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang/Untitled193.ipynb
File Edit View Run Kernel Git Tabs Settings Help
Mem:1.06 GB
FAVORITES
dlang
dlang
FILE BROWSER
new
/ home / dlang /
Name
Last Modified
Symmetry... 2 years ago
Symmetry... a year ago
systemdsp... 3 years ago
Templates 3 years ago
Trilinos 2 years ago
valgrind 3 years ago
Videos 3 years ago
visit 3 years ago
WolframLa... 10 months ago
wqg-wr 2 years ago
writable 3 years ago
new-file.txt 34 minutes ago
Terminal 2
Untitled193.ipynb
Code
Julia 1.8.4
✓ ImageMetadata
✓ Netpbm
✓ ImageIO
✓ Makie
✓ WGLMakie
104 dependencies successfully precompiled in 570 seconds. 143 already precompiled.
[*]: using WGLMakie
[*]: f = Figure()
Axis(f[1, 1])
xs = LinRange(0, 10, 100)
ys = LinRange(0, 15, 100)
zs = [cos(x) * sin(y) for x in xs, y in ys]
contourf!(xs, ys, zs)
f
[ ]:
Simple
Julia 1.8.4 | Busy
Mem: 1.00 GB
Saving completed
Mode: Edit
Ln 1, Col 1
Untitled193.ipynb

PSI Numerical Methods - week | JupyterLab | Julia Downloads (Old releases)

https://symmetry.pi.local/user/dlang/lab/workspaces/auto-Y/tree/home/dlang/Untitled193.ipynb

File Edit View Run Kernel Git Tabs Settings Help

Mem:1.50 GB

FAVORITES

dlang

dlang

FILE BROWSER

new

/ home / dlang /

Name	Last Modified
Symmetry...	2 years ago
Symmetry...	a year ago
systemdsp...	3 years ago
Templates	3 years ago
Trilinos	2 years ago
valgrind	3 years ago
Videos	3 years ago
visit	3 years ago
WolframLa...	10 months ago
wqg-wr	2 years ago
writable	3 years ago
new-file.txt	37 minutes ago

Terminal 2 | Untitled193.ipynb

Code | git | Julia 1.8.4

```
104 dependencies successfully precompiled in 570 seconds. 143 already precompiled.
```

[18]:
```
using WGLMakie
```

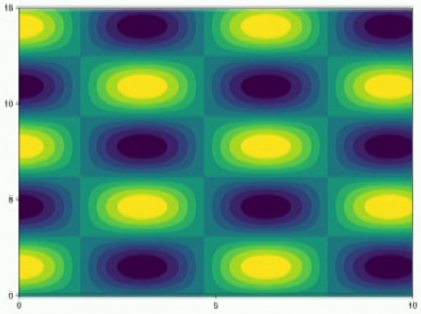
[19]:
```
f = Figure()
Axis(f[1, 1])

xs = LinRange(0, 10, 100)
ys = LinRange(0, 15, 100)
zs = [cos(x) * sin(y) for x in xs, y in ys]

contourf!(xs, ys, zs)

f
```

[19]:



[ ]:

Simple | 2 | 1 | Julia 1.8.4 | Idle | Mem: 1.50 GB | Saving completed | Mode: Edit | Ln 1, Col 1 | Untitled193.ipynb