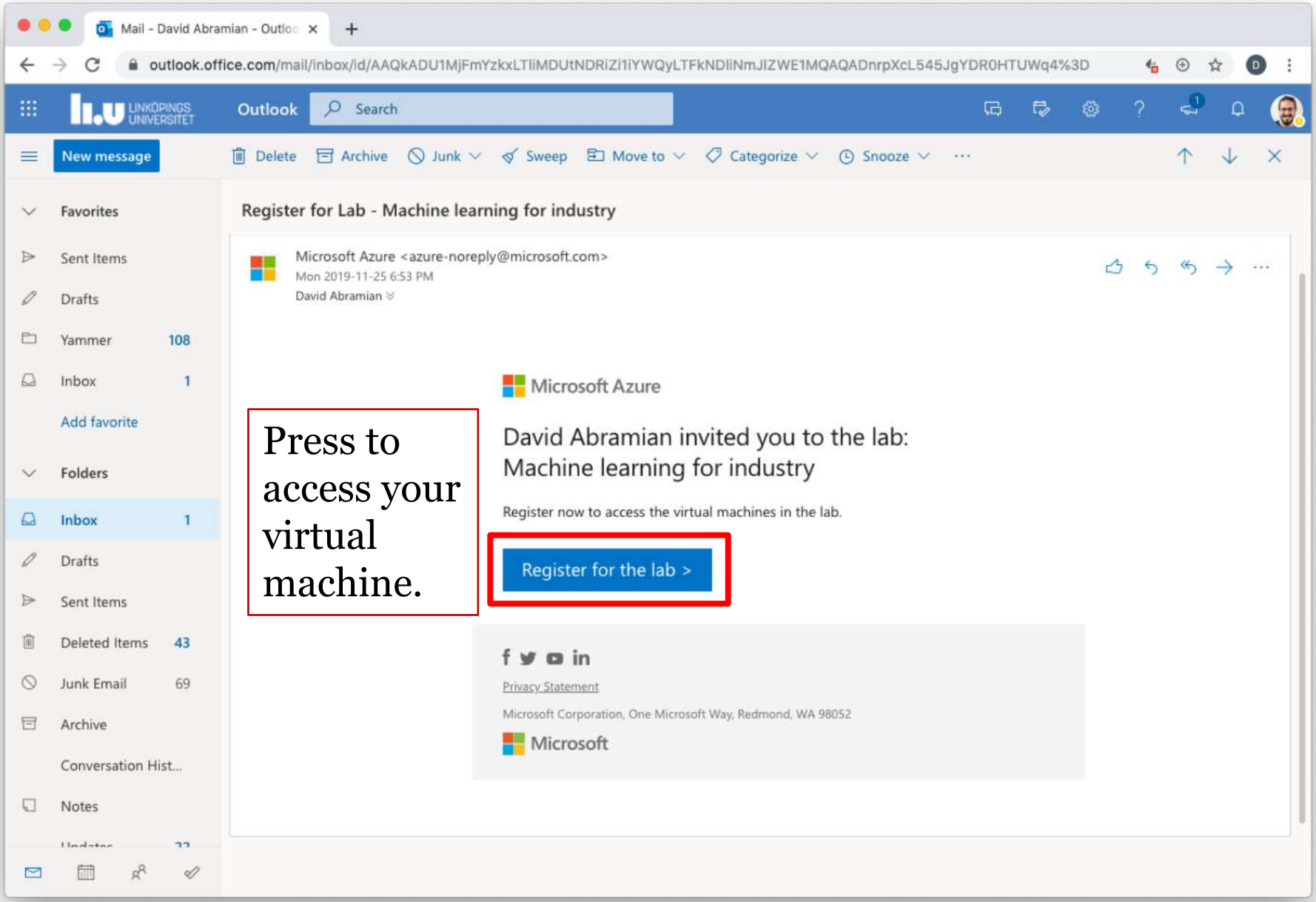
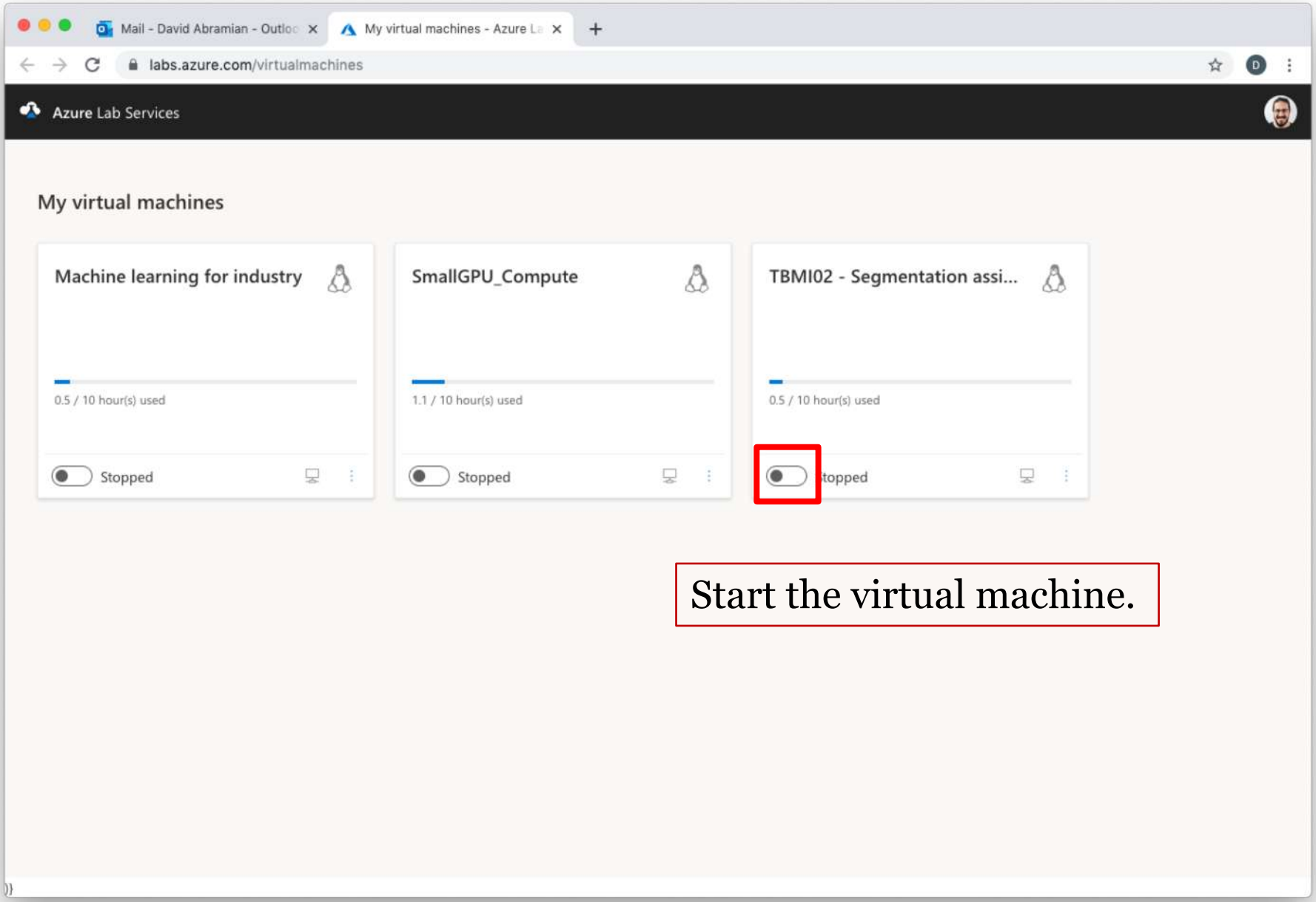
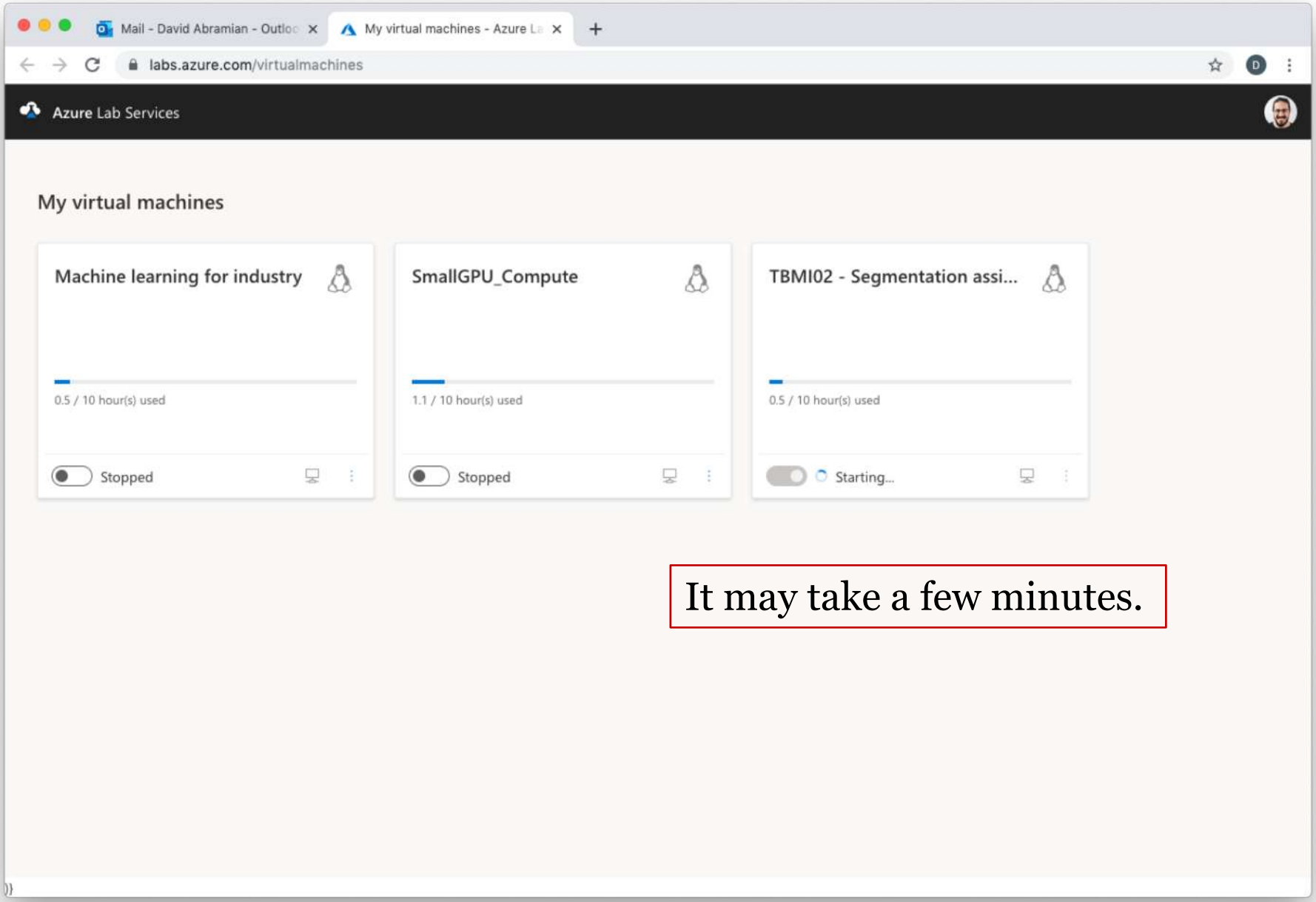
Setting up the CNN labs

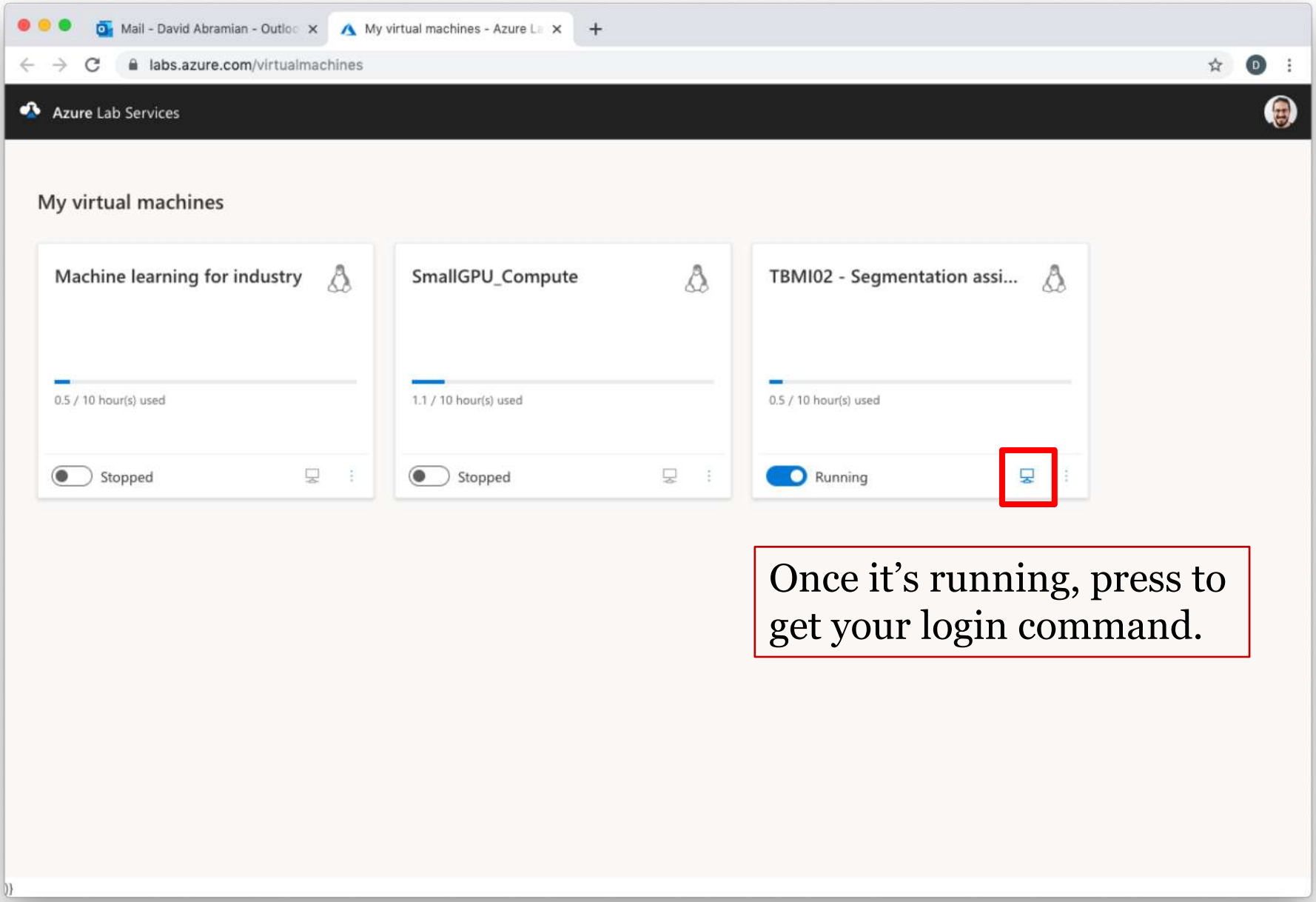
LINKÖPING UNIVERSITY

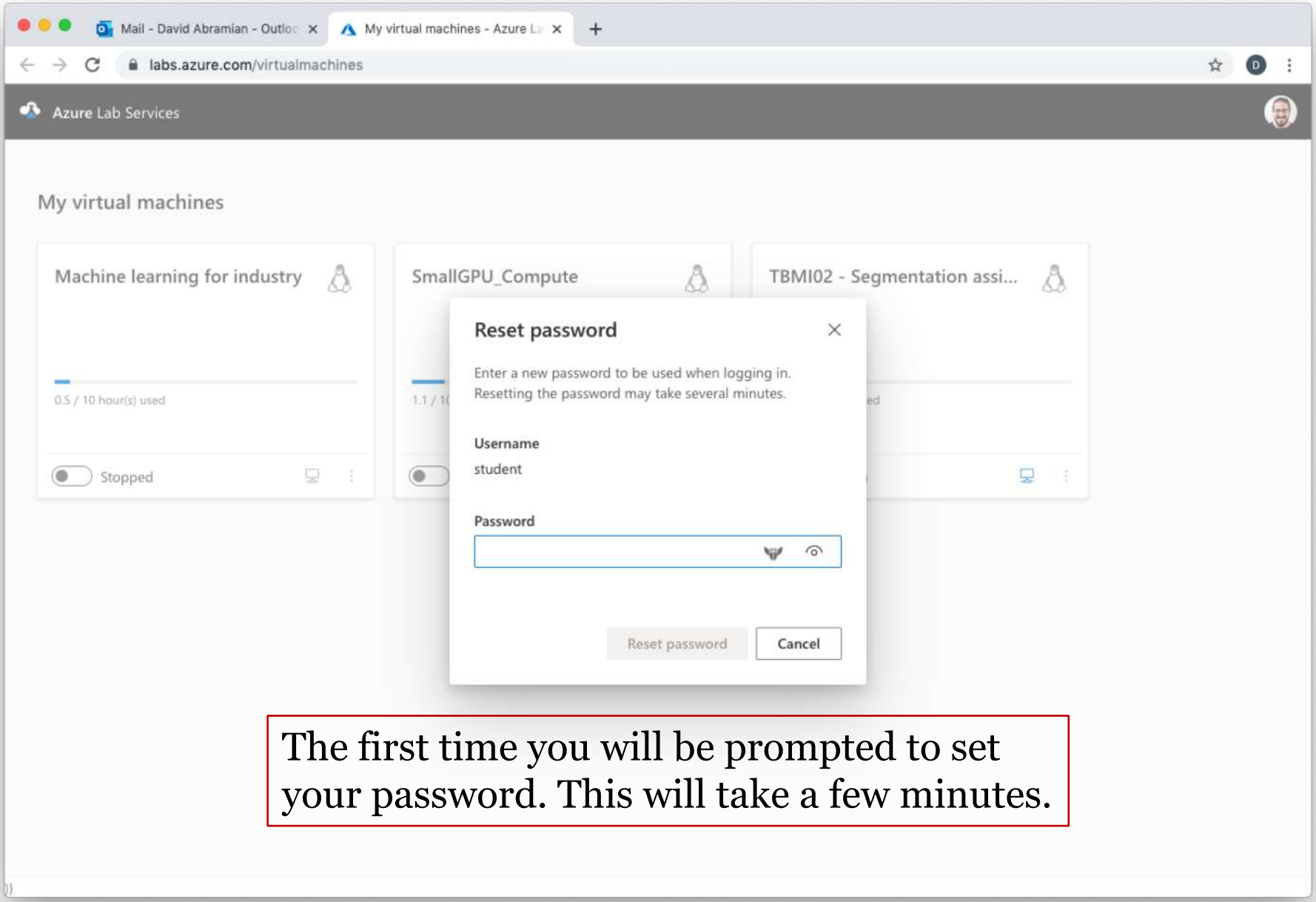
Joining the lab and starting the machines


Mail - David Abramian - Outlo
outlook.office.com/mail/inbox/id/AAQkADU1MjFmYzkxLTliMDUtNDRiZi1iYWQyLTFkNDliNmJlZWE1MQAQADnrpXcL545JgYDR0HTUWq4%3D
LINKÖPINGS UNIVERSITET
Outlook
Search
New message
Delete
Archive
Junk
Sweep
Move to
Categorize
Snooze
Favorites
Sent Items
Drafts
Yammer 108
Inbox 1
Add favorite
Folders
Inbox 1
Drafts
Sent Items
Deleted Items 43
Junk Email 69
Archive
Conversation Hist...
Notes
Register for Lab - Machine learning for industry
Microsoft Azure <azure-noreply@microsoft.com>
Mon 2019-11-25 6:53 PM
David Abramian
Press to access your virtual machine.
Microsoft Azure
David Abramian invited you to the lab:
Machine learning for industry
Register now to access the virtual machines in the lab.
Register for the lab >
Privacy Statement
Microsoft Corporation, One Microsoft Way, Redmond, WA 98052
Microsoft

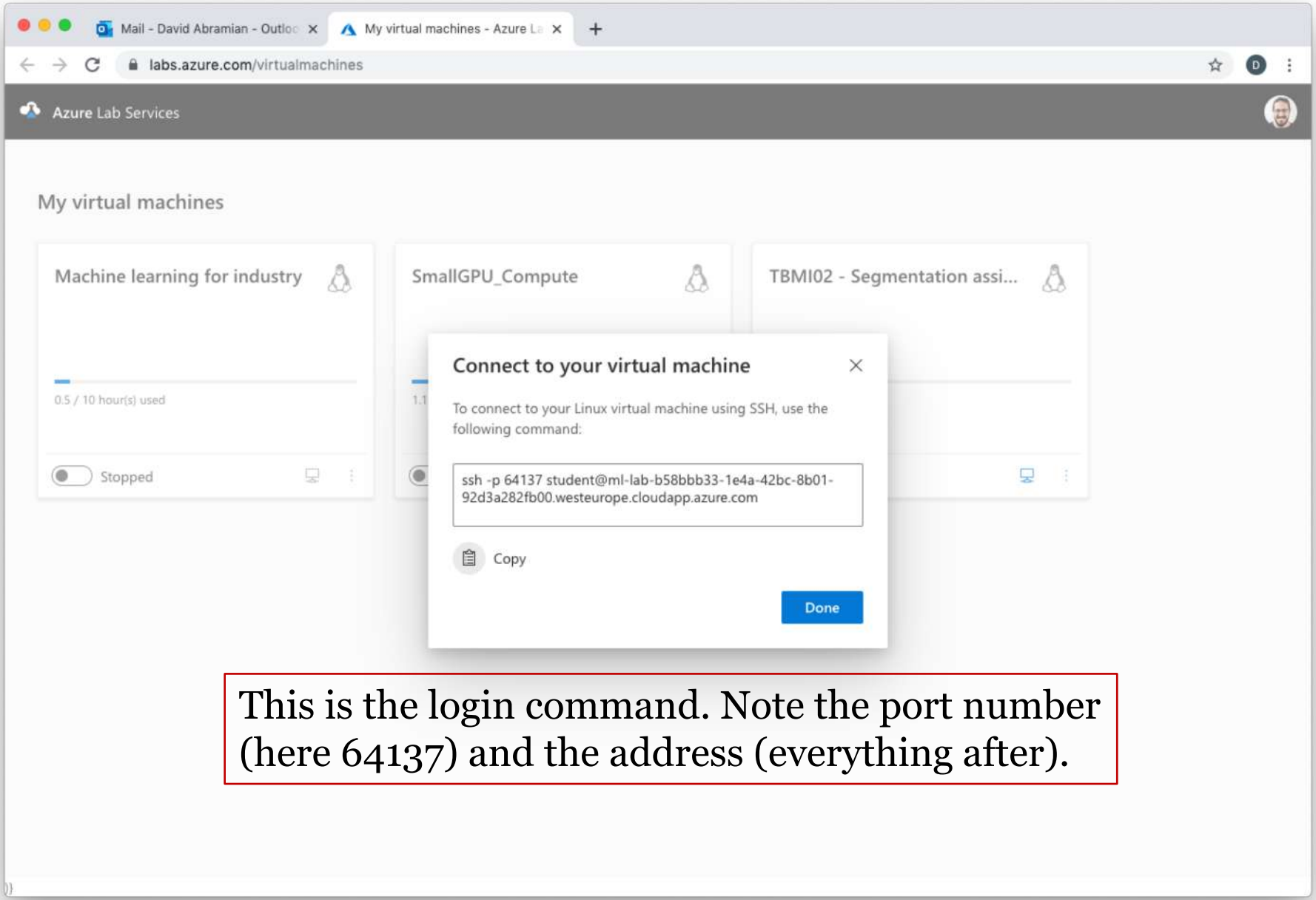

Mail - David Abramian - Outlo
My virtual machines - Azure La
labs.azure.com/virtualmachines
Azure Lab Services
My virtual machines
Machine learning for industry
0.5 / 10 hour(s) used
Stopped
SmallGPU_Compute
1.1 / 10 hour(s) used
Stopped
TBMI02 - Segmentation assi...
0.5 / 10 hour(s) used
topped
Start the virtual machine.


Mail - David Abramian - Outlo
My virtual machines - Azure La
labs.azure.com/virtualmachines
Azure Lab Services
My virtual machines
Machine learning for industry
0.5 / 10 hour(s) used
Stopped
SmallGPU_Compute
1.1 / 10 hour(s) used
Stopped
TBMI02 - Segmentation assi...
0.5 / 10 hour(s) used
Starting...
It may take a few minutes.


Mail - David Abramian - Outlo
My virtual machines - Azure La
labs.azure.com/virtualmachines
Azure Lab Services
My virtual machines
Machine learning for industry
0.5 / 10 hour(s) used
Stopped
SmallGPU_Compute
1.1 / 10 hour(s) used
Stopped
TBMI02 - Segmentation assi...
0.5 / 10 hour(s) used
Running
Once it's running, press to get your login command.

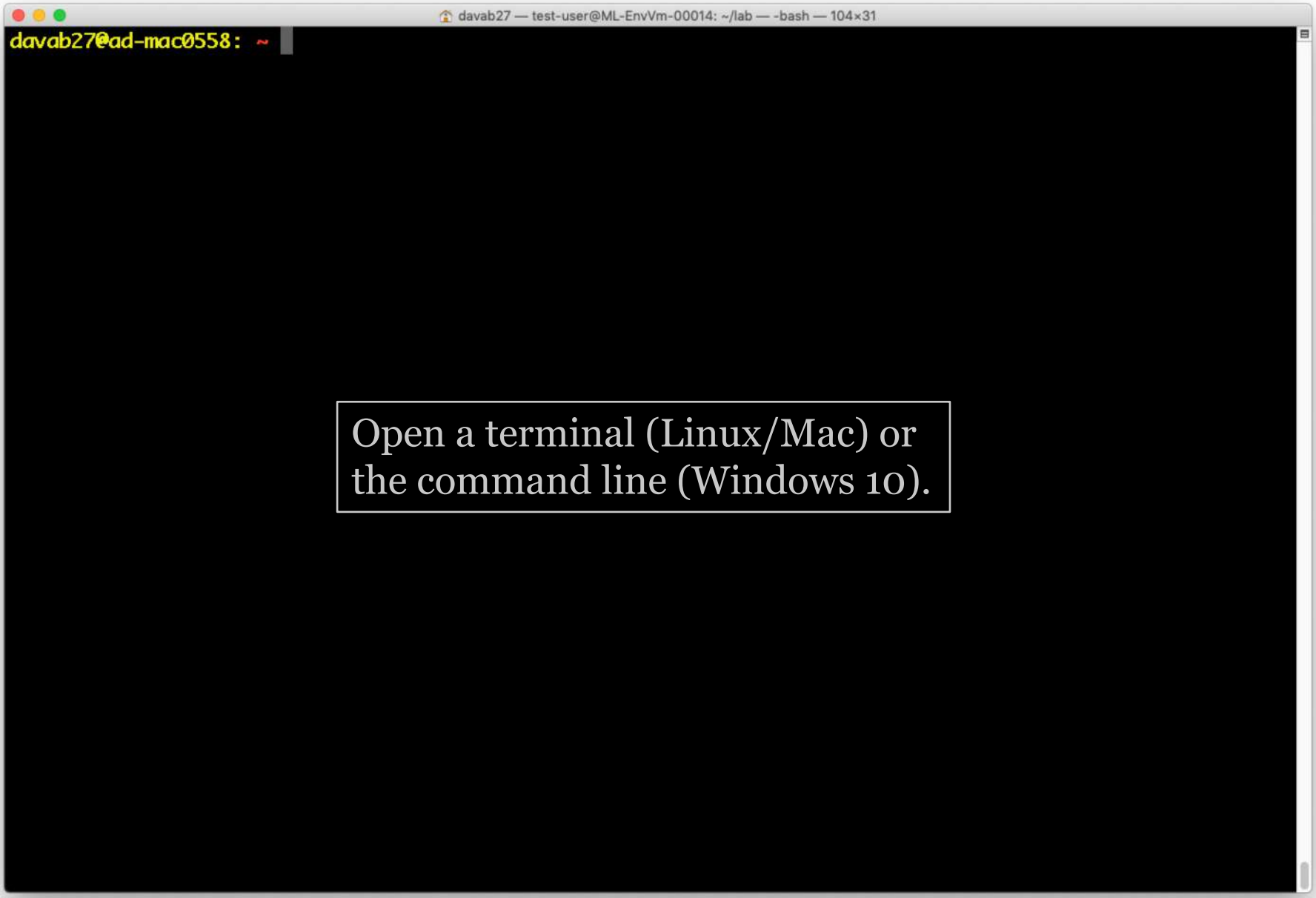


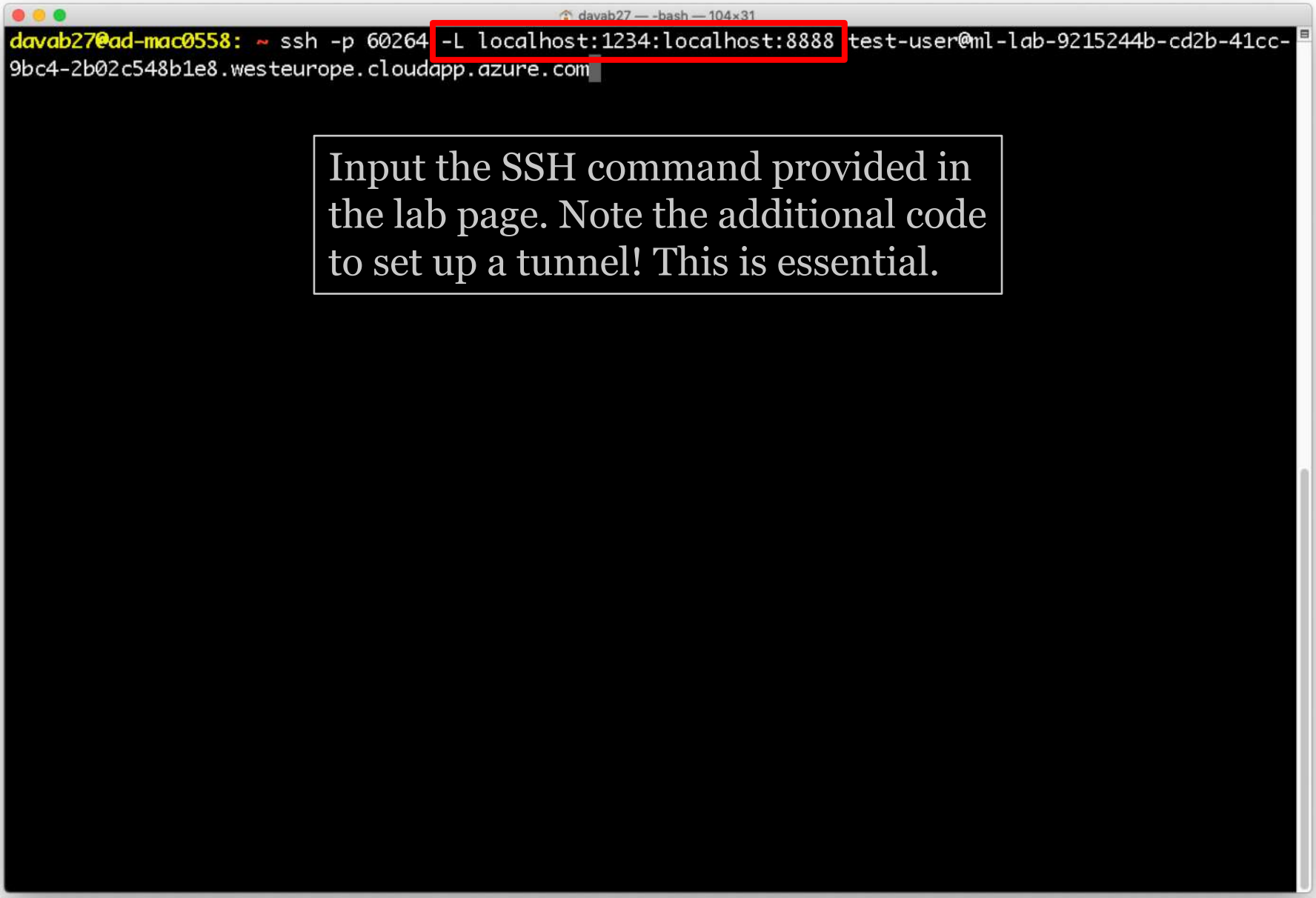
The first time you will be prompted to set your password. This will take a few minutes.

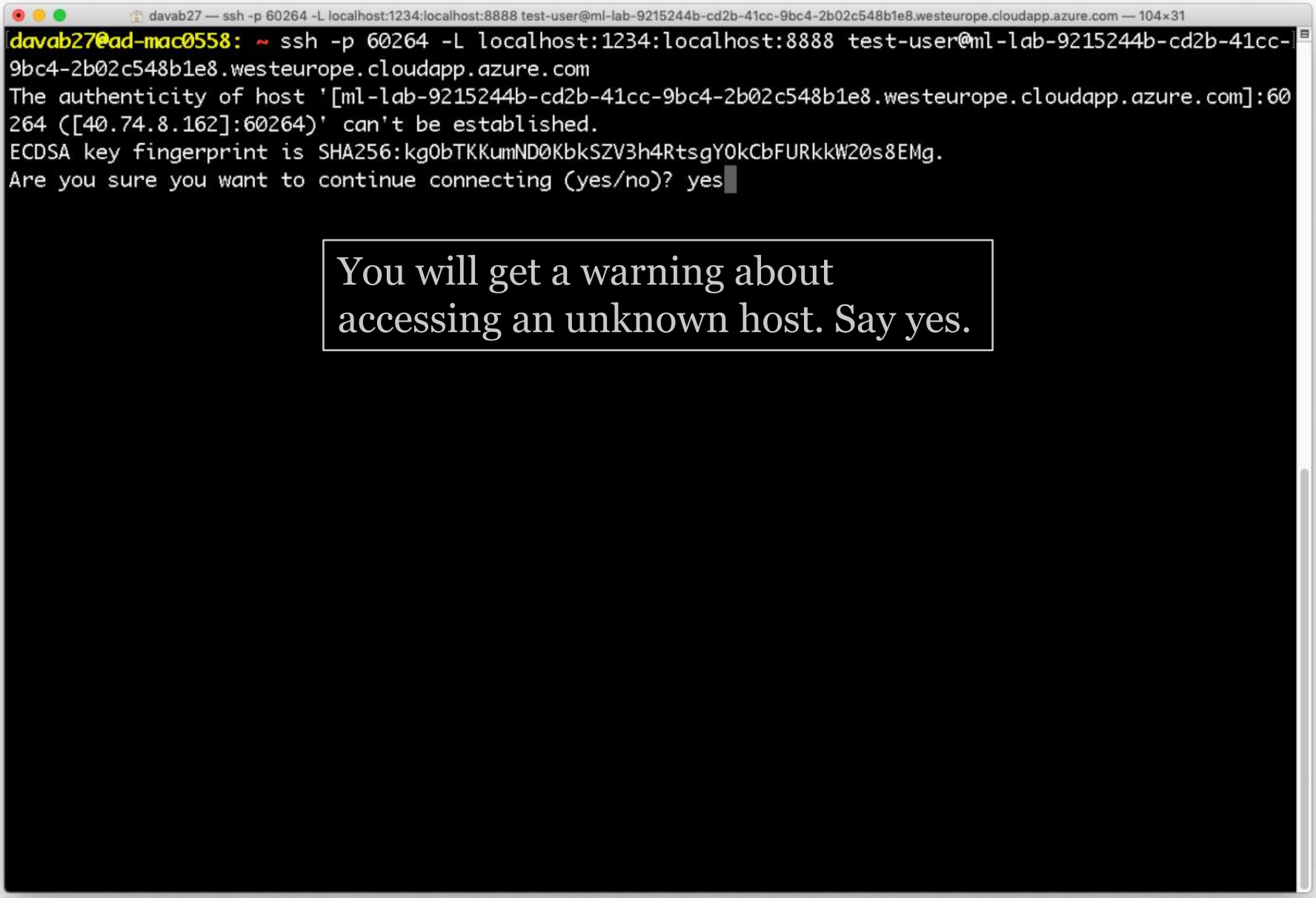


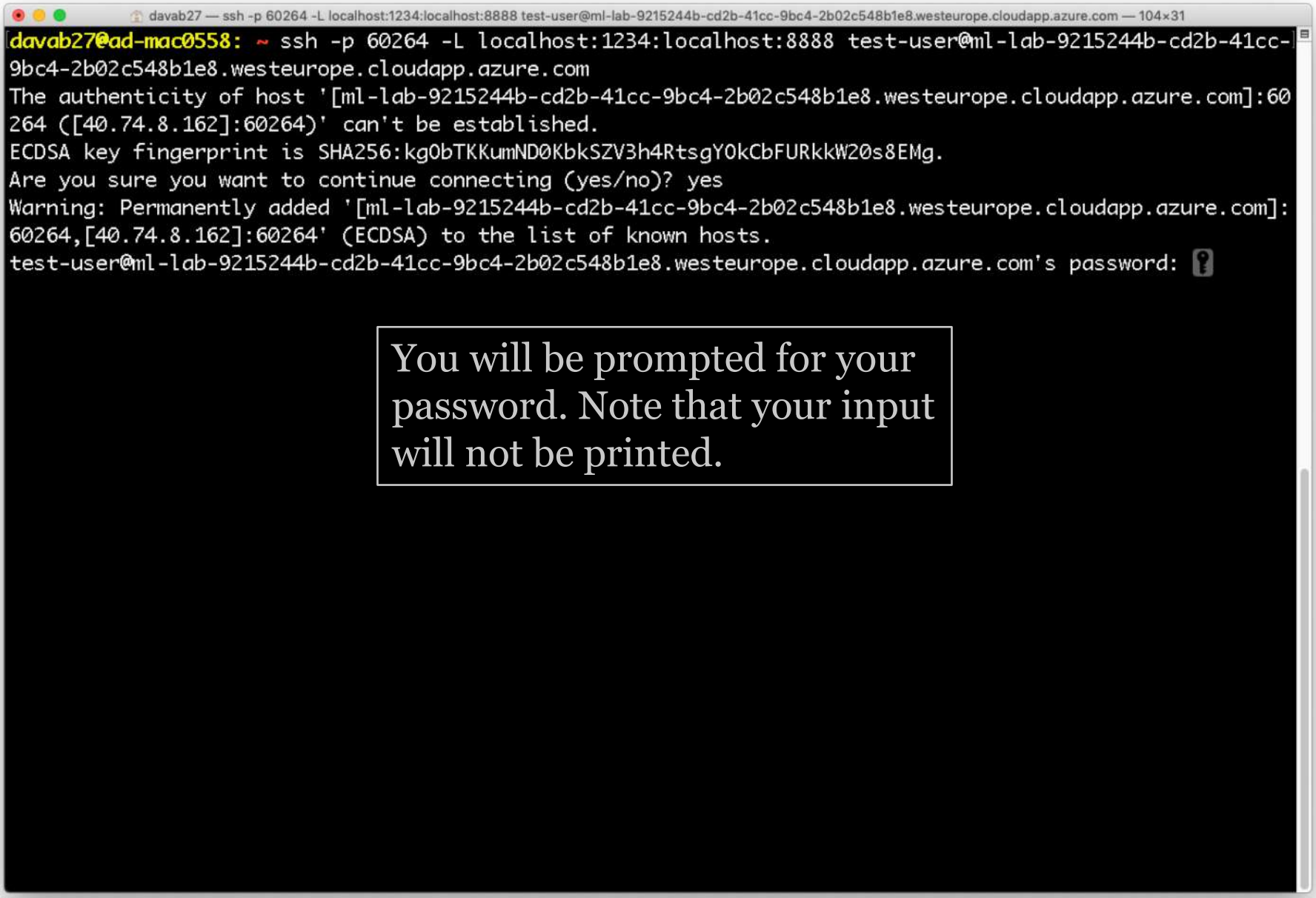
This is the login command. Note the port number (here 64137) and the address (everything after).

Logging in with Linux/Mac/Windows 10

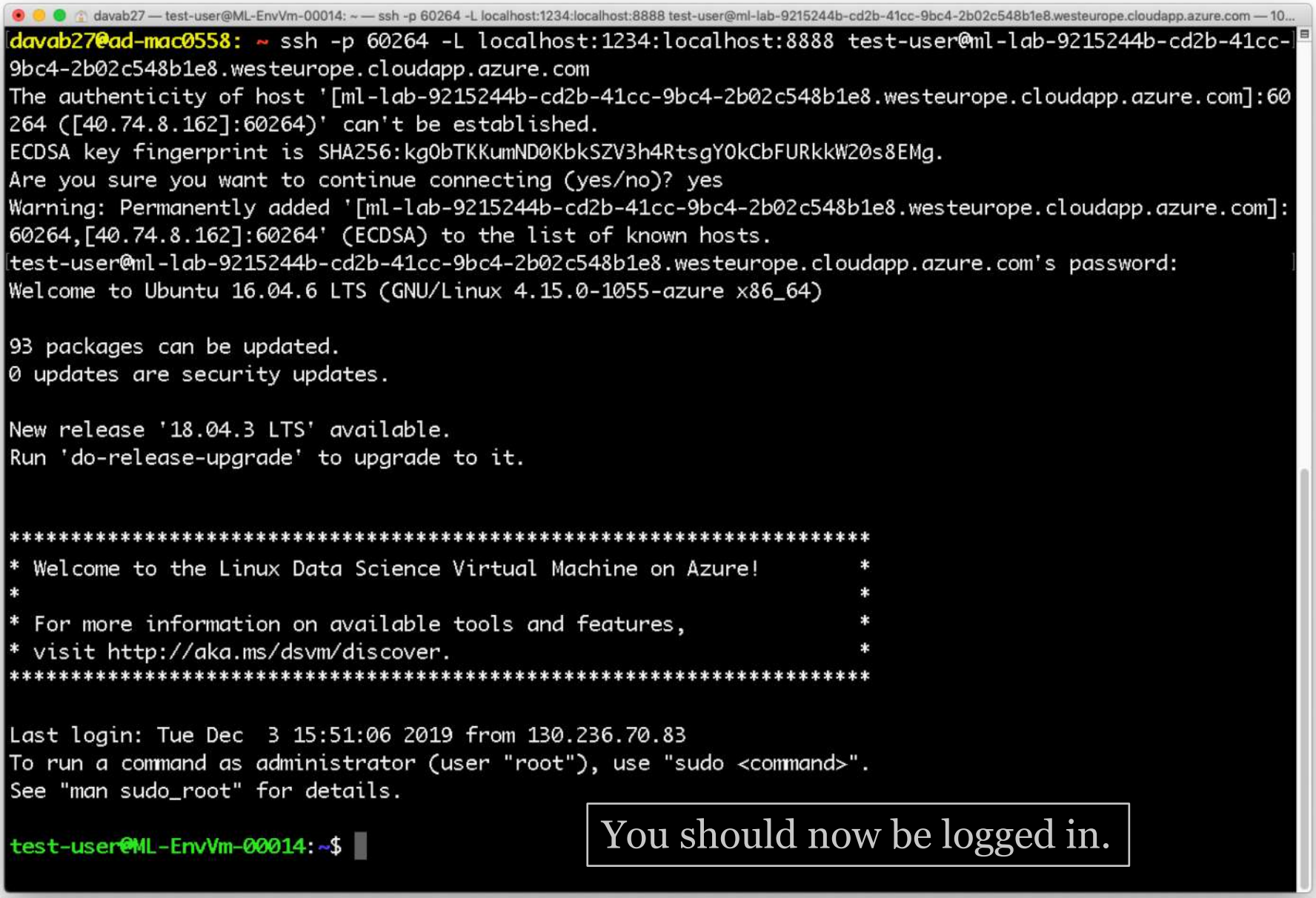

davab27 — test-user@ML-EnvVm-00014: ~/lab — -bash — 104×31
davab27@ad-mac0558: ~
Open a terminal (Linux/Mac) or
the command line (Windows 10).


davab27 — -bash — 104×31
davab27@ad-mac0558: ~ ssh -p 60264 -L localhost:1234:localhost:8888 test-user@ml-lab-9215244b-cd2b-41cc-9bc4-2b02c548b1e8.westeurope.cloudapp.azure.com
Input the SSH command provided in the lab page. Note the additional code to set up a tunnel! This is essential.


davab27 — ssh -p 60264 -L localhost:1234:localhost:8888 test-user@ml-lab-9215244b-cd2b-41cc-9bc4-2b02c548b1e8.westeurope.cloudapp.azure.com — 104×31
davab27@ad-mac0558: ~ ssh -p 60264 -L localhost:1234:localhost:8888 test-user@ml-lab-9215244b-cd2b-41cc-
9bc4-2b02c548b1e8.westeurope.cloudapp.azure.com
The authenticity of host '[ml-lab-9215244b-cd2b-41cc-9bc4-2b02c548b1e8.westeurope.cloudapp.azure.com]:60
264 ([40.74.8.162]:60264)' can't be established.
ECDSA key fingerprint is SHA256:kgObTKKumND0KbkSZV3h4RtsgYOkCbFURkkW20s8EMg.
Are you sure you want to continue connecting (yes/no)? yes
You will get a warning about
accessing an unknown host. Say yes.



You will be prompted for your password. Note that your input will not be printed.


davab27 — test-user@ML-EnvVm-00014: ~ — ssh -p 60264 -L localhost:1234:localhost:8888 test-user@ml-lab-9215244b-cd2b-41cc-9bc4-2b02c548b1e8.westeurope.cloudapp.azure.com — 10...
davab27@ad-mac0558: ~ ssh -p 60264 -L localhost:1234:localhost:8888 test-user@ml-lab-9215244b-cd2b-41cc-
9bc4-2b02c548b1e8.westeurope.cloudapp.azure.com
The authenticity of host '[ml-lab-9215244b-cd2b-41cc-9bc4-2b02c548b1e8.westeurope.cloudapp.azure.com]:60
264 ([40.74.8.162]:60264)' can't be established.
ECDSA key fingerprint is SHA256:kg0bTKKumND0KbkSZV3h4RtsgY0kCbFURkkW20s8EMg.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '[ml-lab-9215244b-cd2b-41cc-9bc4-2b02c548b1e8.westeurope.cloudapp.azure.com]:
60264,[40.74.8.162]:60264' (ECDSA) to the list of known hosts.
test-user@ml-lab-9215244b-cd2b-41cc-9bc4-2b02c548b1e8.westeurope.cloudapp.azure.com's password:
Welcome to Ubuntu 16.04.6 LTS (GNU/Linux 4.15.0-1055-azure x86_64)
93 packages can be updated.
0 updates are security updates.
New release '18.04.3 LTS' available.
Run 'do-release-upgrade' to upgrade to it.
* Welcome to the Linux Data Science Virtual Machine on Azure!
* For more information on available tools and features,
* visit http://aka.ms/dsvm/discover.
Last login: Tue Dec 3 15:51:06 2019 from 130.236.70.83
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.
test-user@ML-EnvVm-00014:~$
You should now be logged in.

Logging in with Windows 7

Download PuTTY - a free SSH an

putty.org

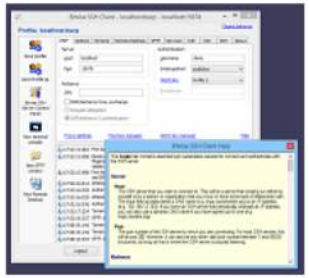
Download PuTTY

PuTTY is an SSH and telnet client, developed originally by Simon Tatham for the Windows platform. PuTTY is open source software that is available with source code and is developed and supported by a group of volunteers.

You can download PuTTY here.

You will need the PuTTY SSH client.

Below suggestions are independent of the authors of PuTTY. They are *not* to be seen as endorsements by the PuTTY project.

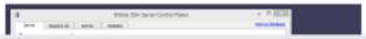


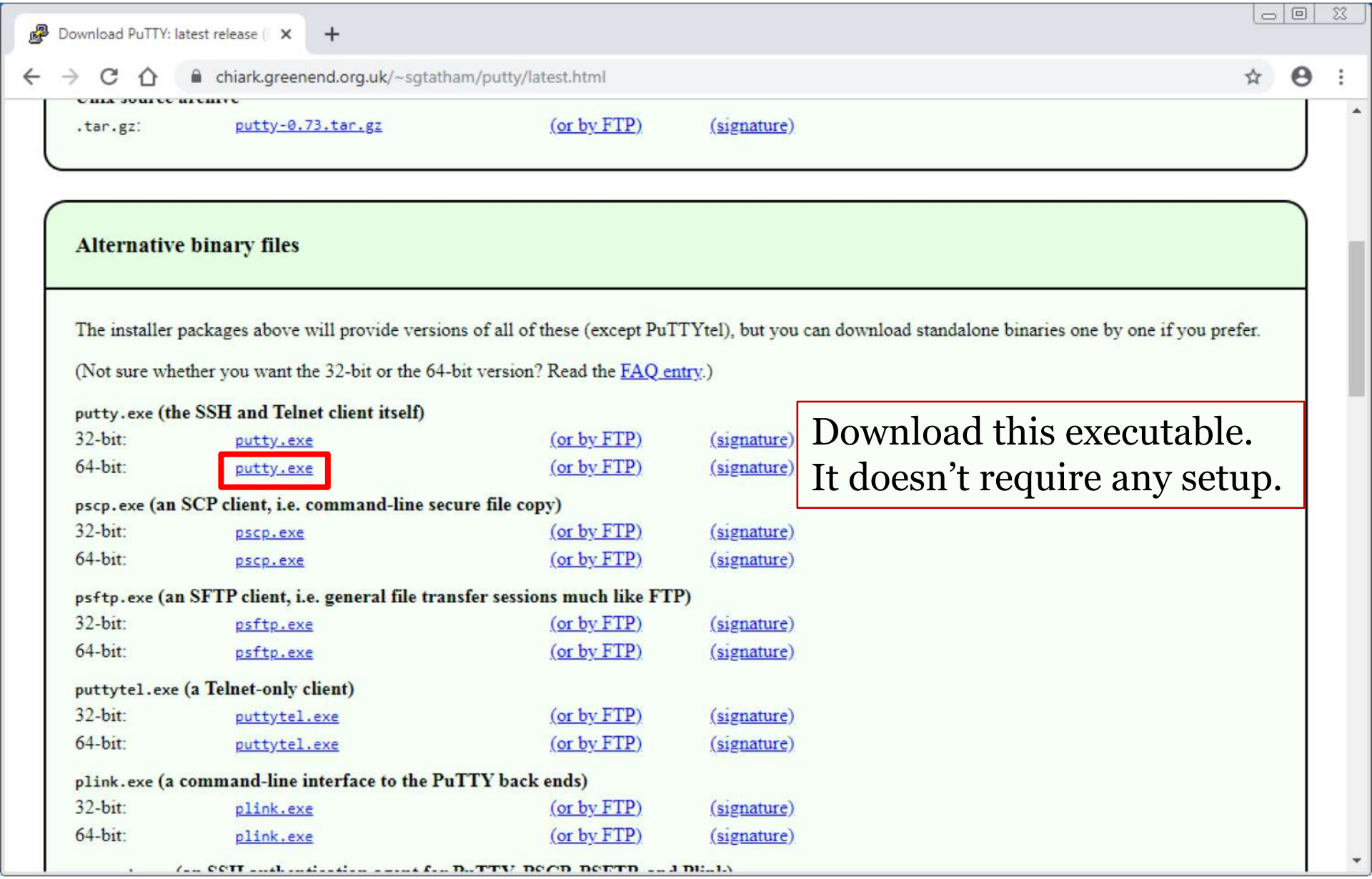
Bitvise SSH Client

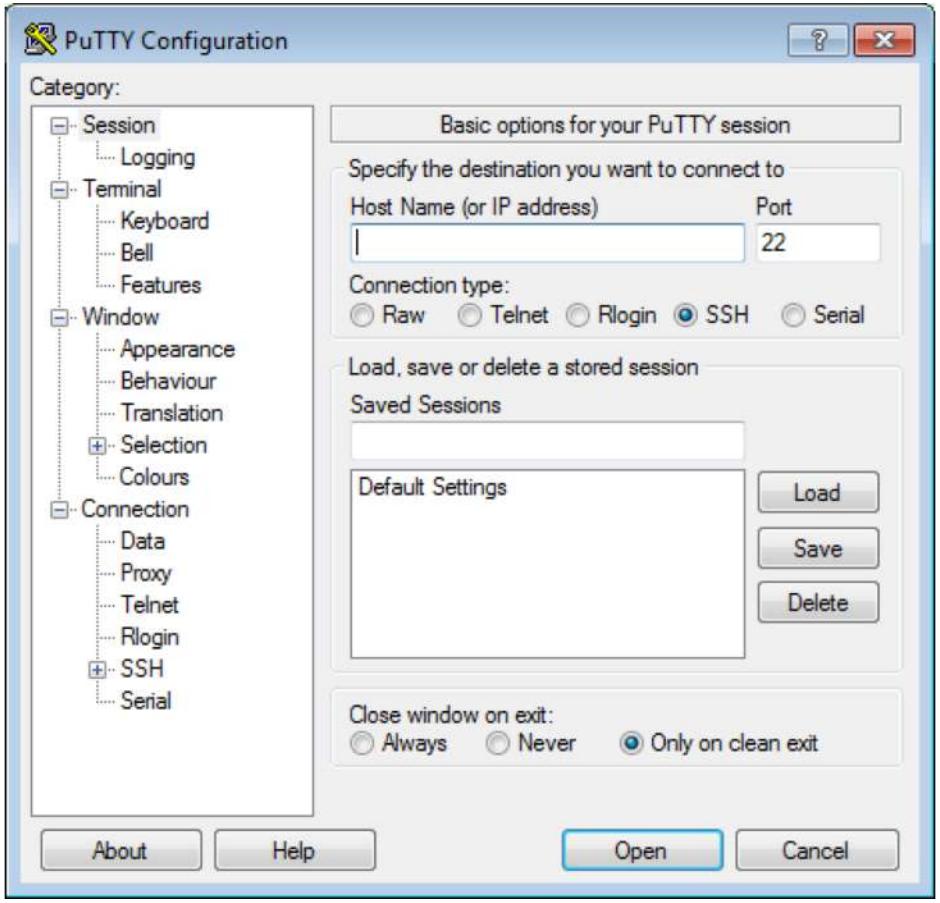
Bitvise SSH Client is an SSH and SFTP client for Windows. It is developed and supported professionally by Bitvise. The SSH Client is robust, easy to install, easy to use, and supports all features supported by PuTTY, as well as the following:

- graphical SFTP file transfer;
- single-click Remote Desktop tunneling;
- auto-reconnecting capability;
- dynamic port forwarding through an integrated proxy;
- an FTP-to-SFTP protocol bridge.

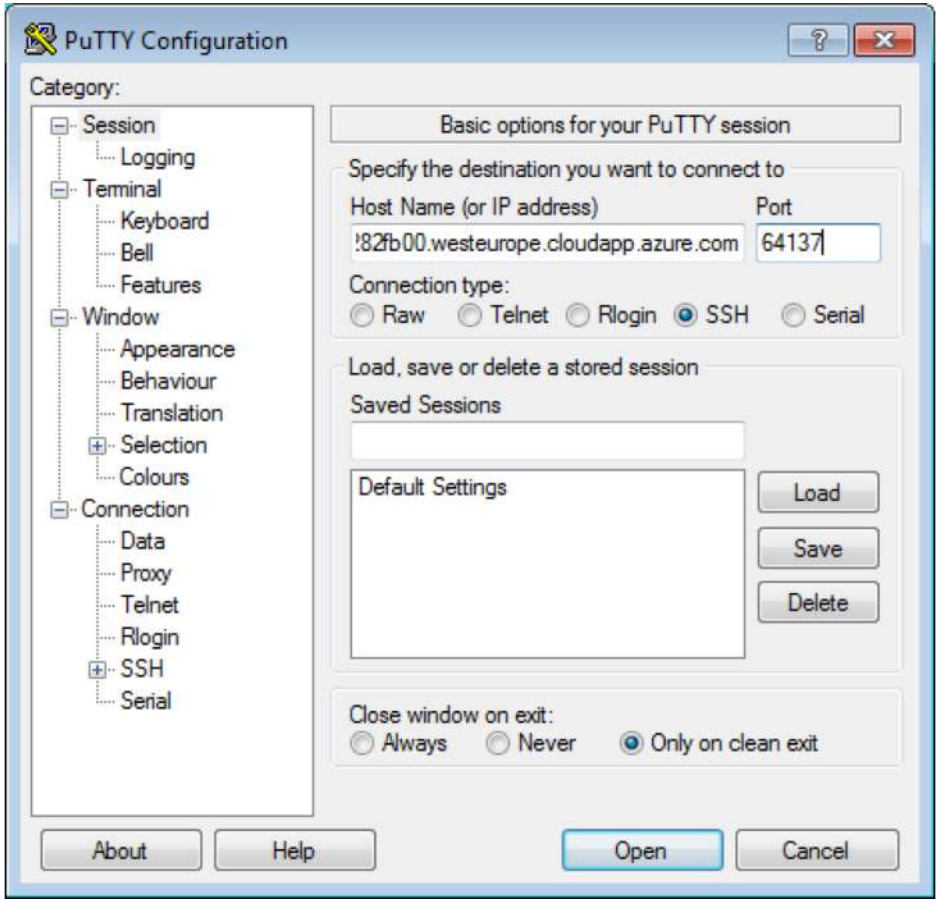
Bitvise SSH Client is **free to use**. You can download it here.



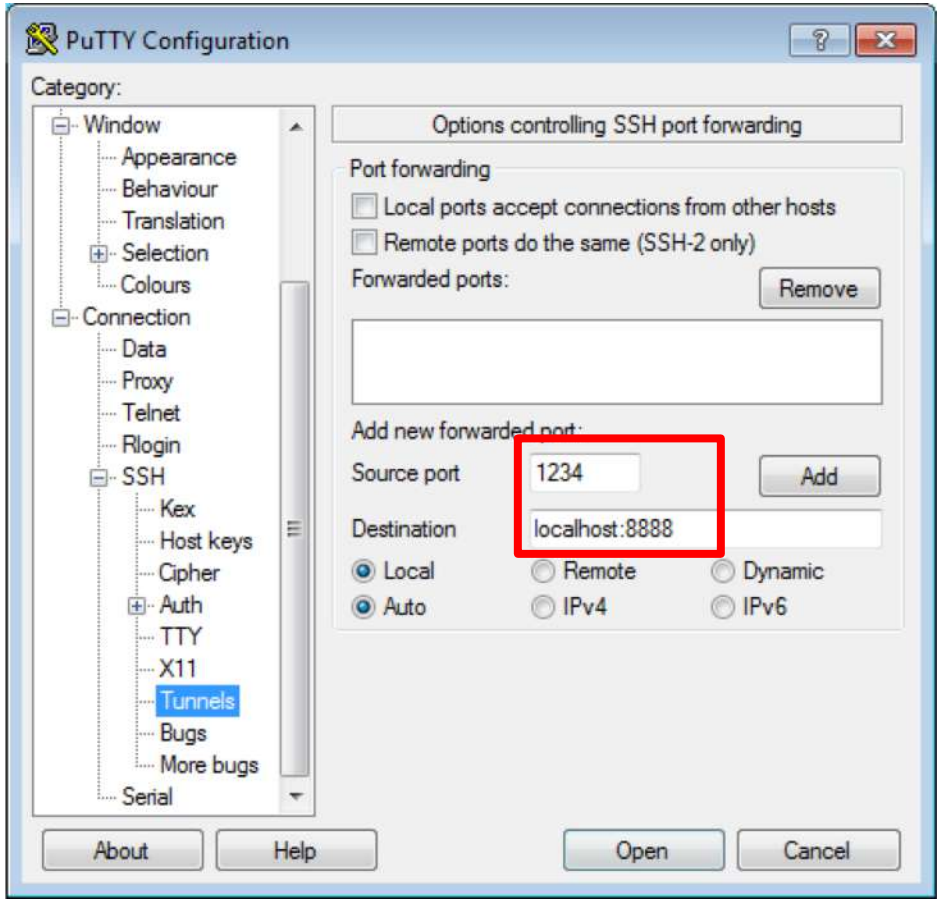

Download PuTTY: latest release
chiark.greenend.org.uk/~sgtatham/putty/latest.html
.tar.gz: putty-0.73.tar.gz (or by FTP) (signature)
Alternative binary files
The installer packages above will provide versions of all of these (except PuTTYtel), but you can download standalone binaries one by one if you prefer.
(Not sure whether you want the 32-bit or the 64-bit version? Read the FAQ entry.)
putty.exe (the SSH and Telnet client itself)
32-bit: putty.exe (or by FTP) (signature)
64-bit: putty.exe (or by FTP) (signature)
pscp.exe (an SCP client, i.e. command-line secure file copy)
32-bit: pscp.exe (or by FTP) (signature)
64-bit: pscp.exe (or by FTP) (signature)
psftp.exe (an SFTP client, i.e. general file transfer sessions much like FTP)
32-bit: psftp.exe (or by FTP) (signature)
64-bit: psftp.exe (or by FTP) (signature)
puttytel.exe (a Telnet-only client)
32-bit: puttytel.exe (or by FTP) (signature)
64-bit: puttytel.exe (or by FTP) (signature)
plink.exe (a command-line interface to the PuTTY back ends)
32-bit: plink.exe (or by FTP) (signature)
64-bit: plink.exe (or by FTP) (signature)
Download this executable.
It doesn't require any setup.



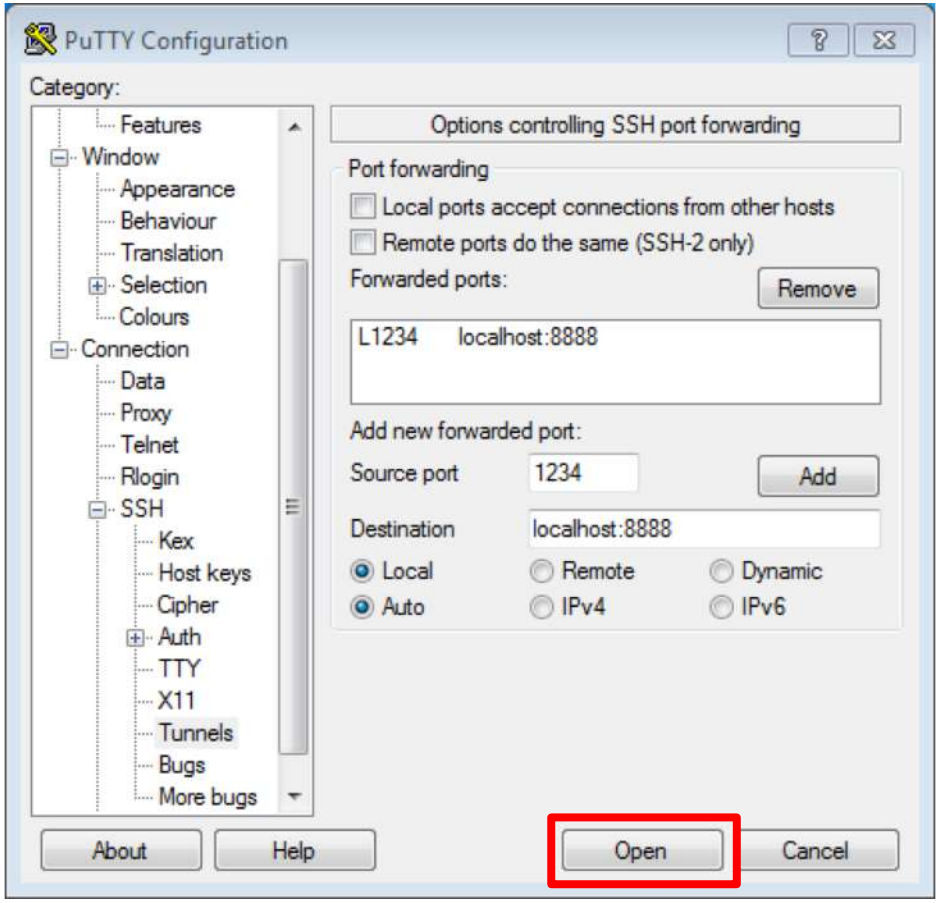
Launch putty.exe.



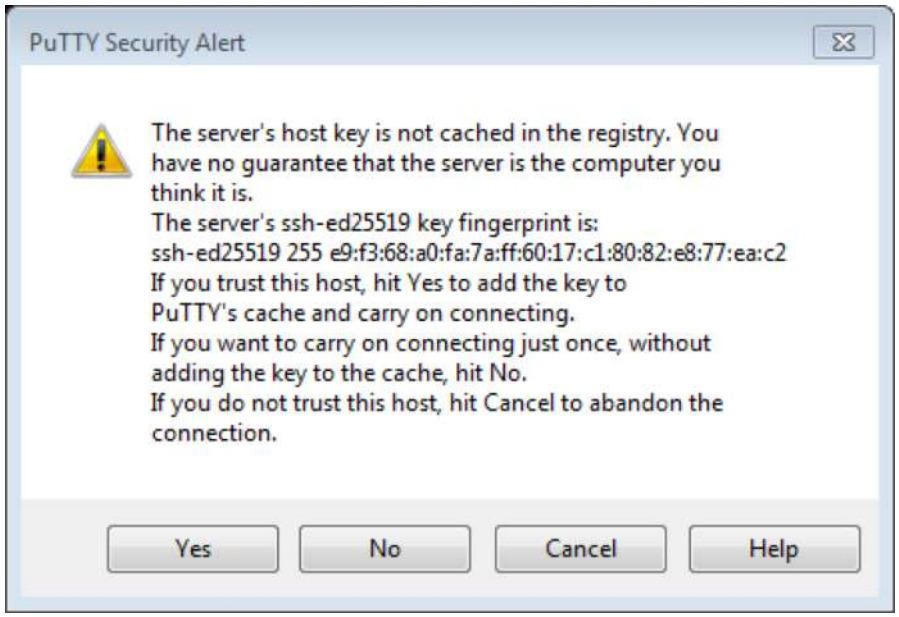
Input the address
and port from earlier.



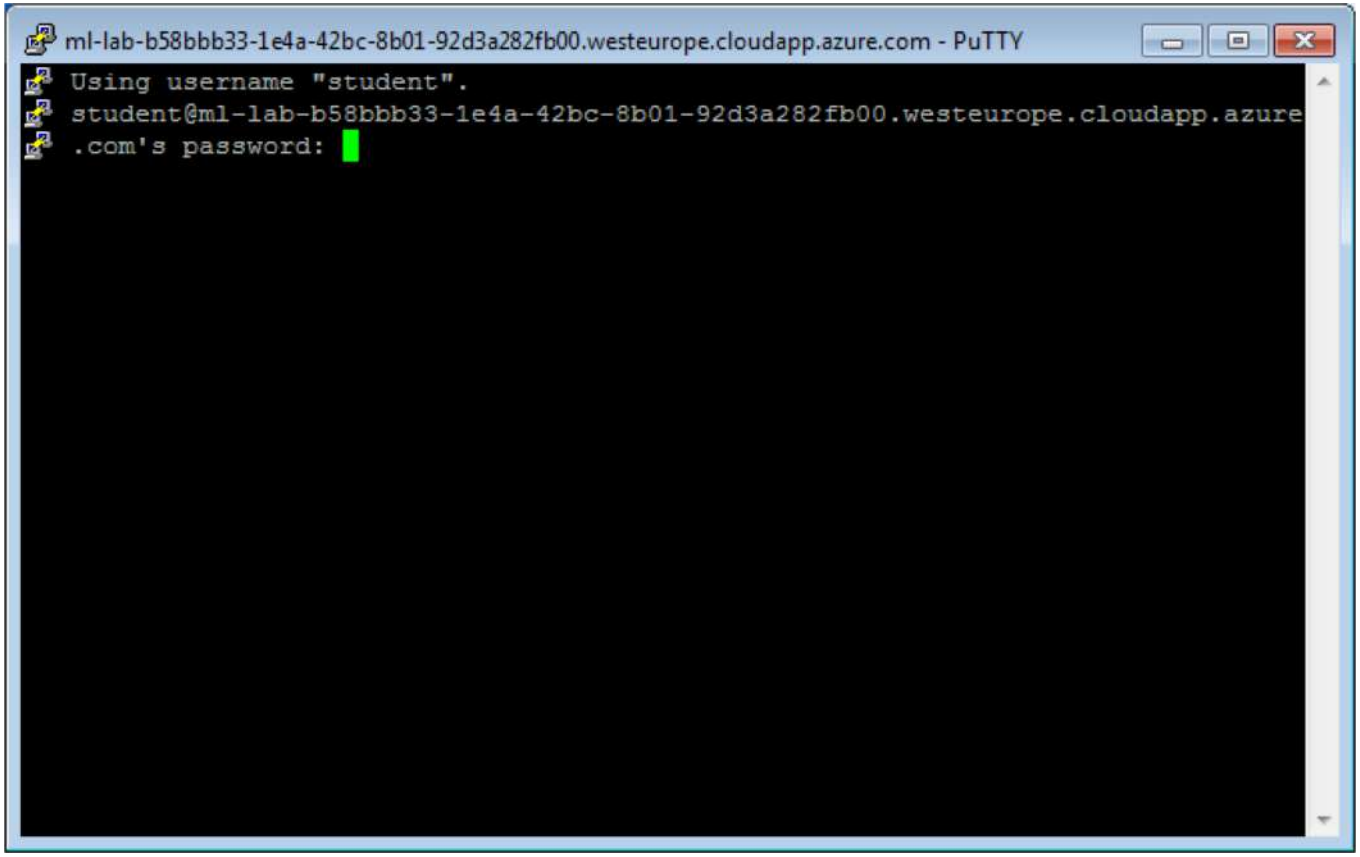
Setup the tunnel and press Add.


PuTTY Configuration
Category:
Features
Window
Appearance
Behaviour
Translation
Selection
Colours
Connection
Data
Proxy
Telnet
Rlogin
SSH
Kex
Host keys
Cipher
Auth
TTY
X11
Tunnels
Bugs
More bugs
Options controlling SSH port forwarding
Port forwarding
Local ports accept connections from other hosts
Remote ports do the same (SSH-2 only)
Forwarded ports:
Remove
L1234 localhost:8888
Add new forwarded port:
Source port
1234
Add
Destination
localhost:8888
Local
Remote
Dynamic
Auto
IPv4
IPv6
About
Help
Open
Cancel

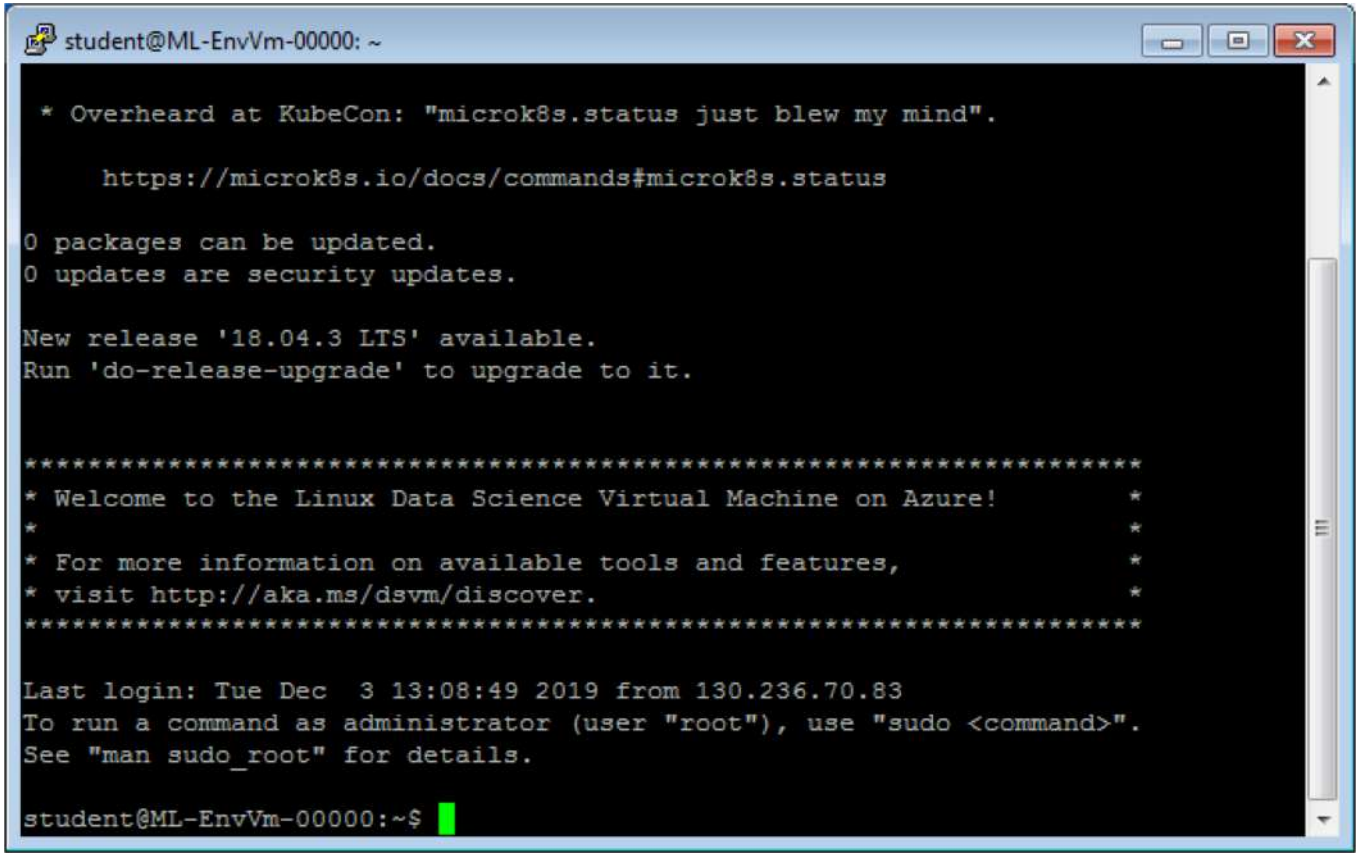
Press Open.



You will get a warning about accessing an unknown host. Say yes.

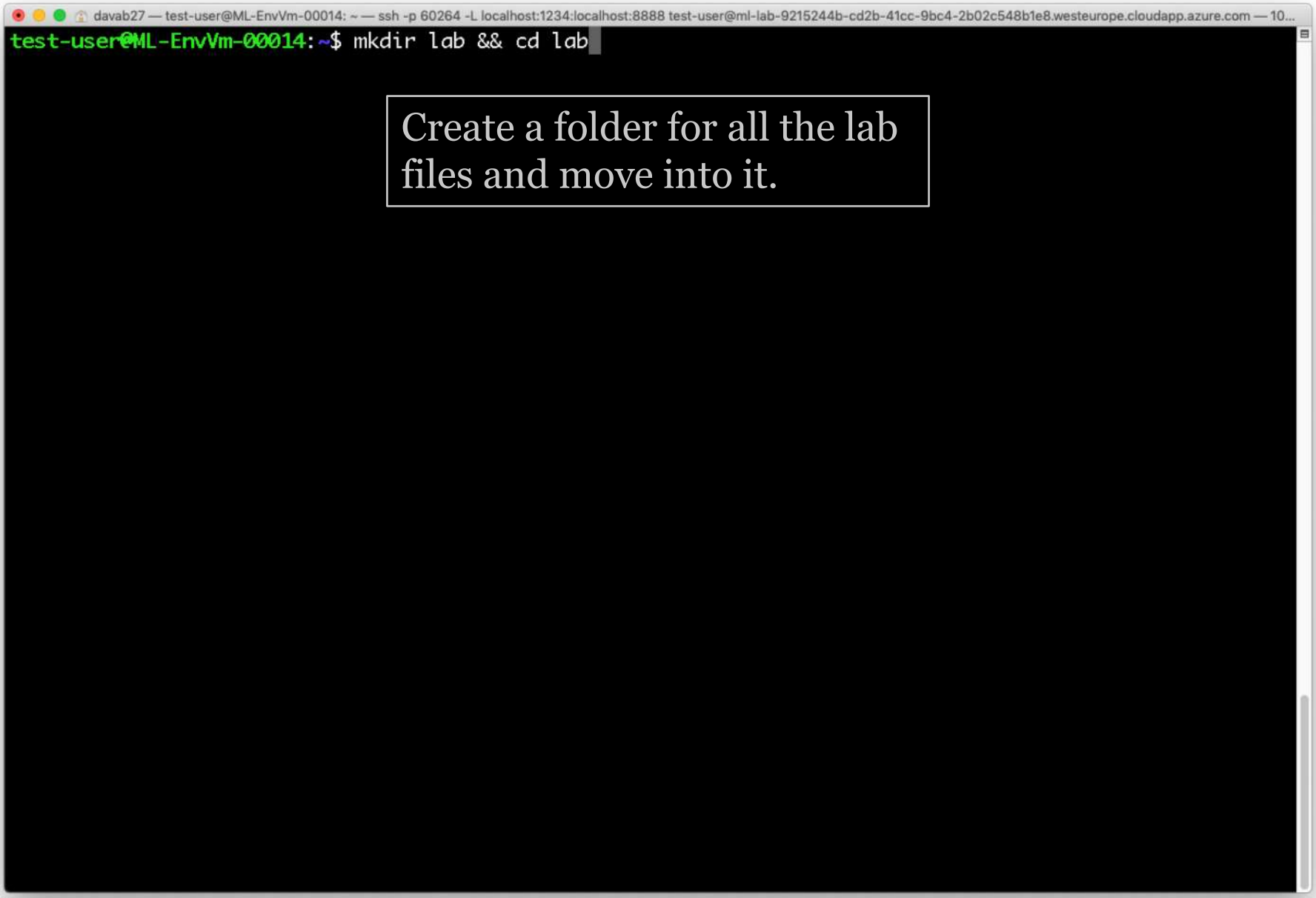


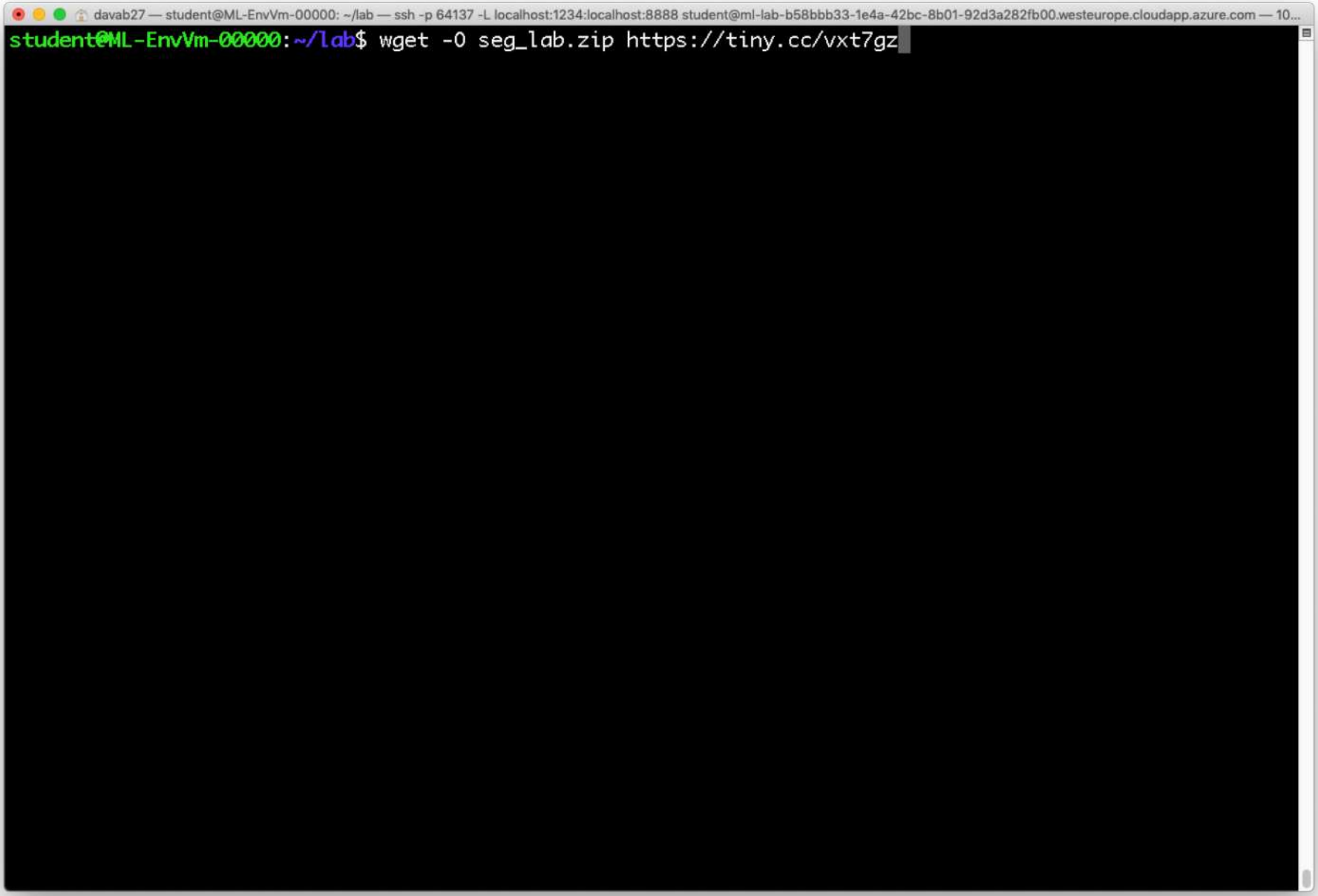
You will be prompted for your password. Note that your input will not be printed.



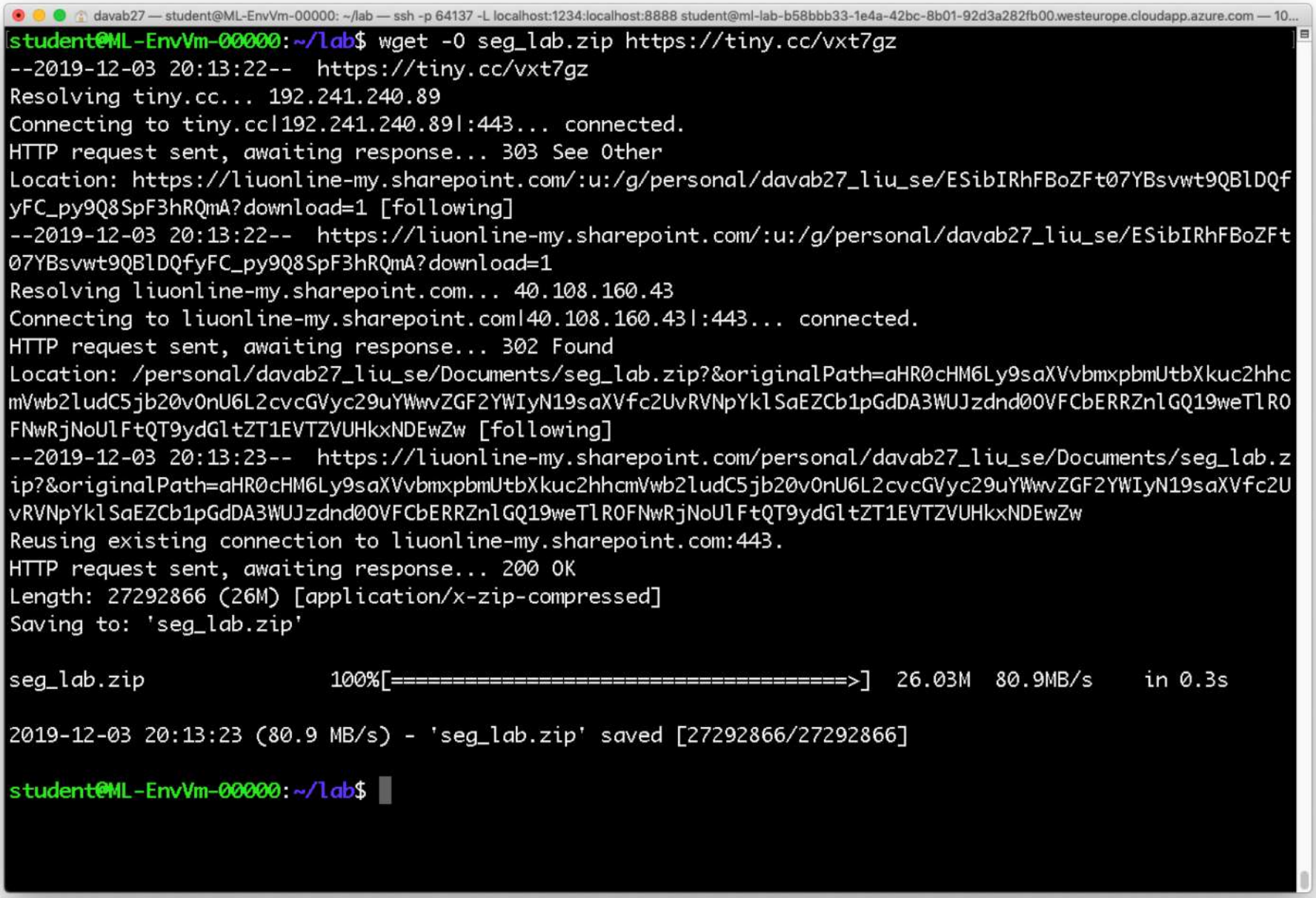
You should now be logged in.

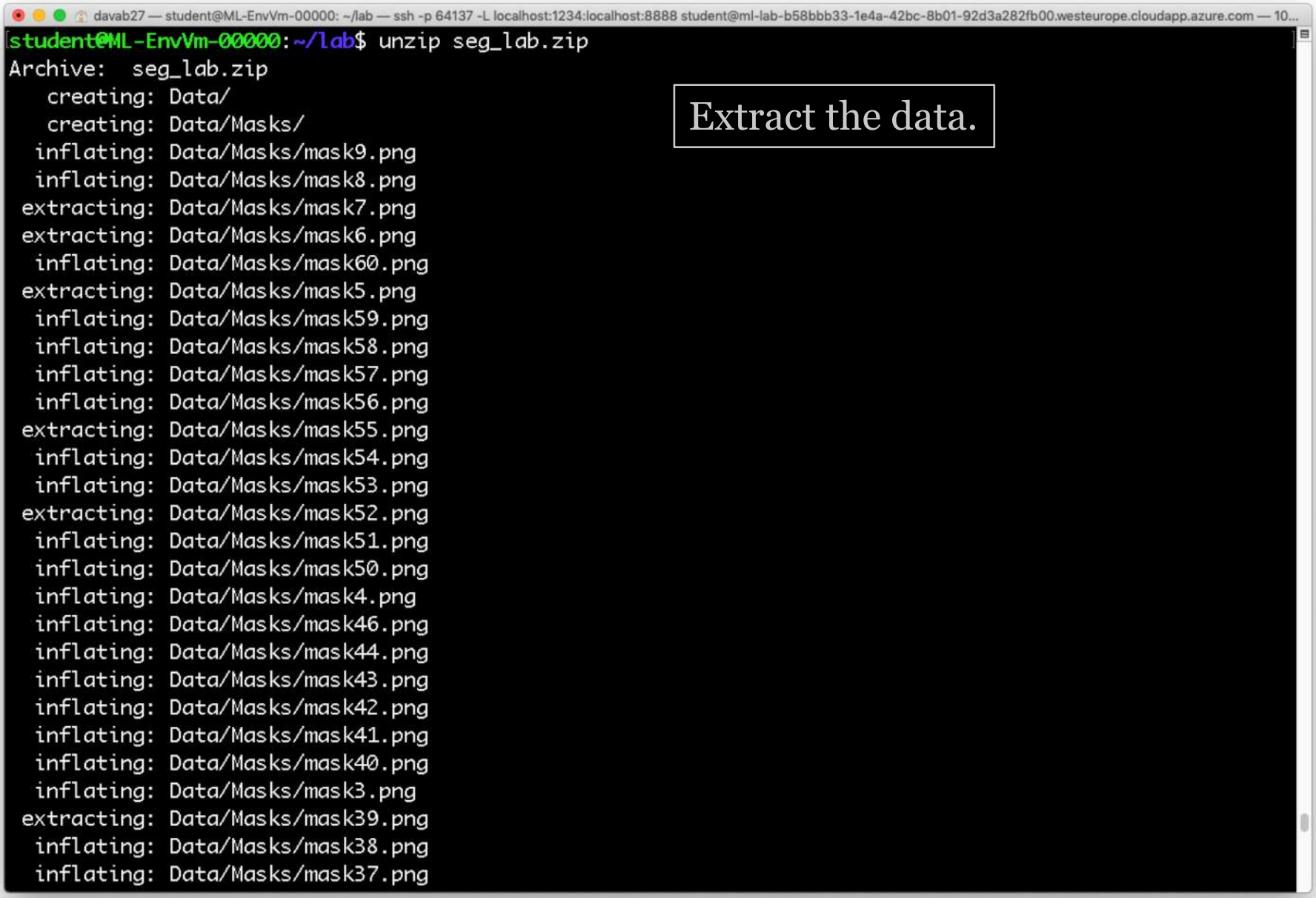
Setting up the environment

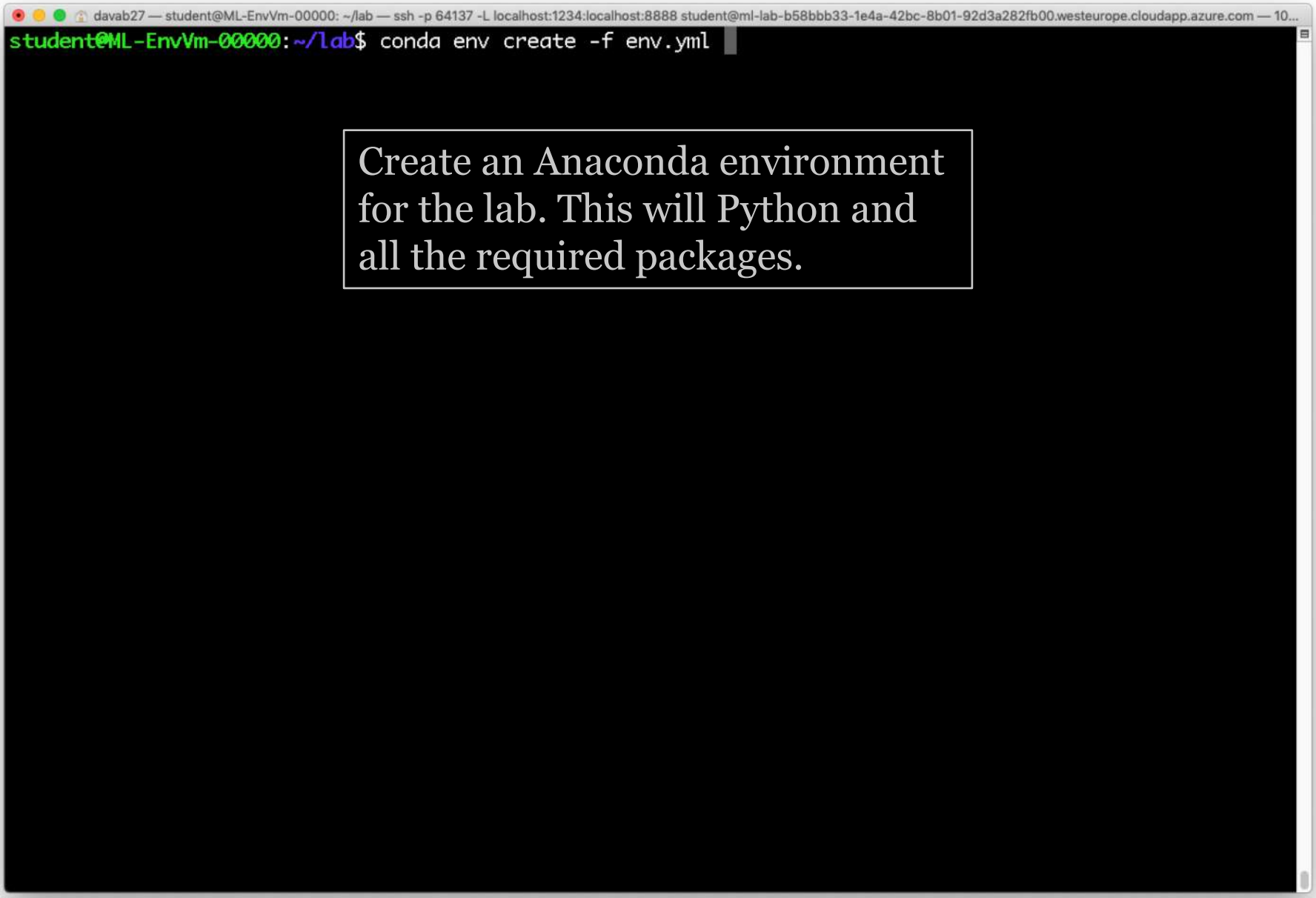

davab27 — test-user@ML-EnvVm-00014: ~ — ssh -p 60264 -L localhost:1234:localhost:8888 test-user@ml-lab-9215244b-cd2b-41cc-9bc4-2b02c548b1e8.westeurope.cloudapp.azure.com — 10...
test-user@ML-EnvVm-00014:~$ mkdir lab && cd lab
Create a folder for all the lab files and move into it.

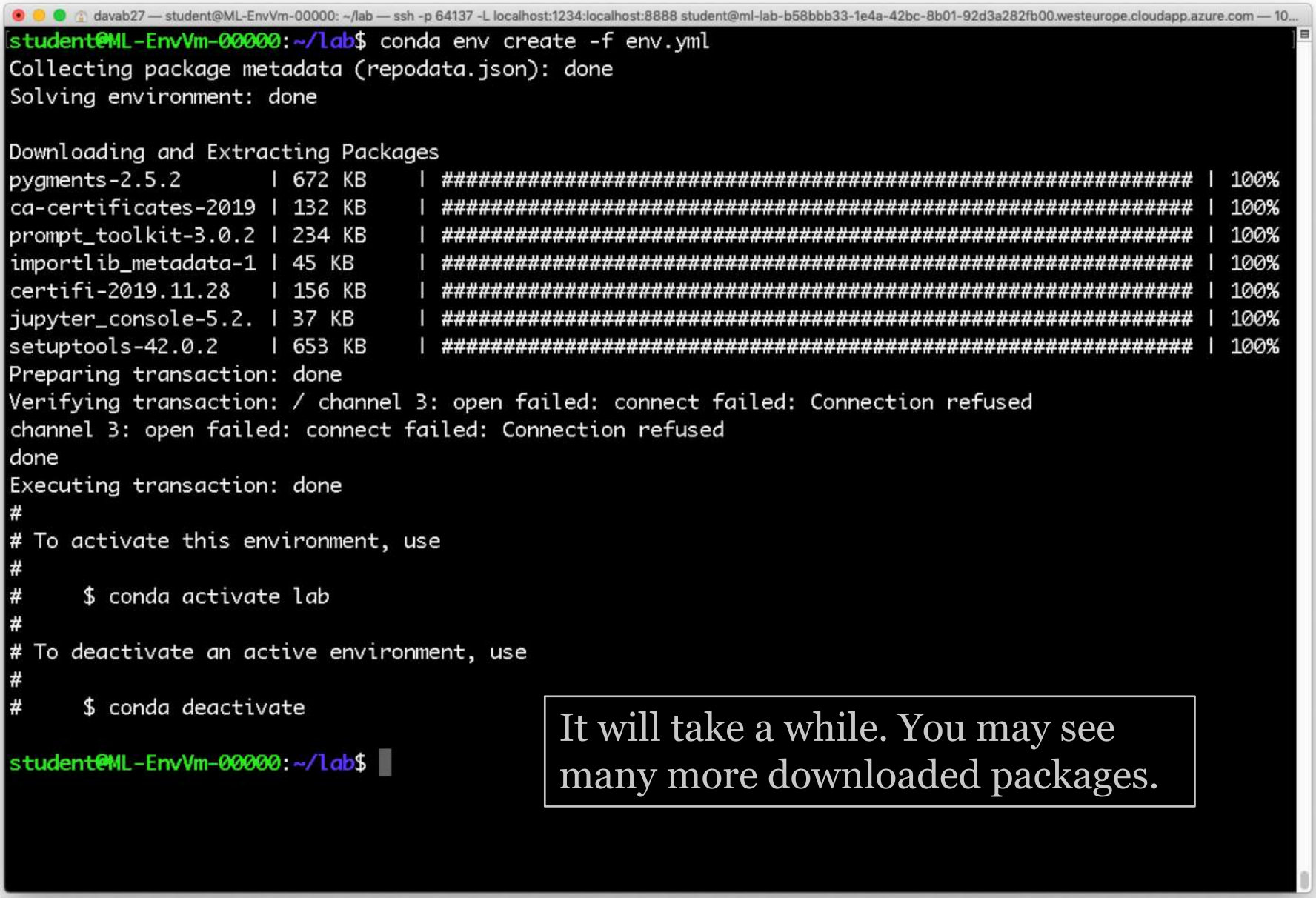


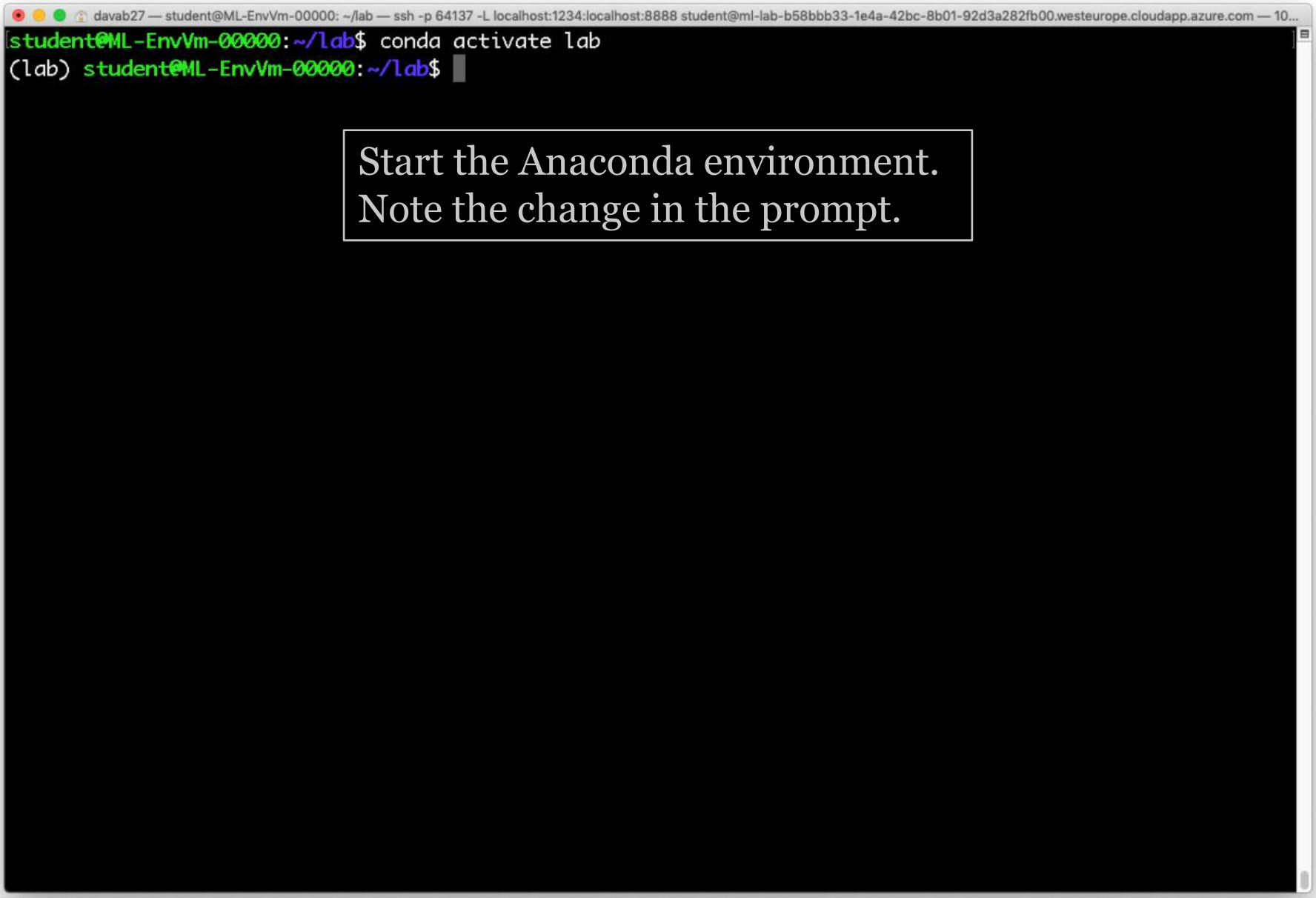
Download the lab files. The option -O uses the letter O, not a zero.

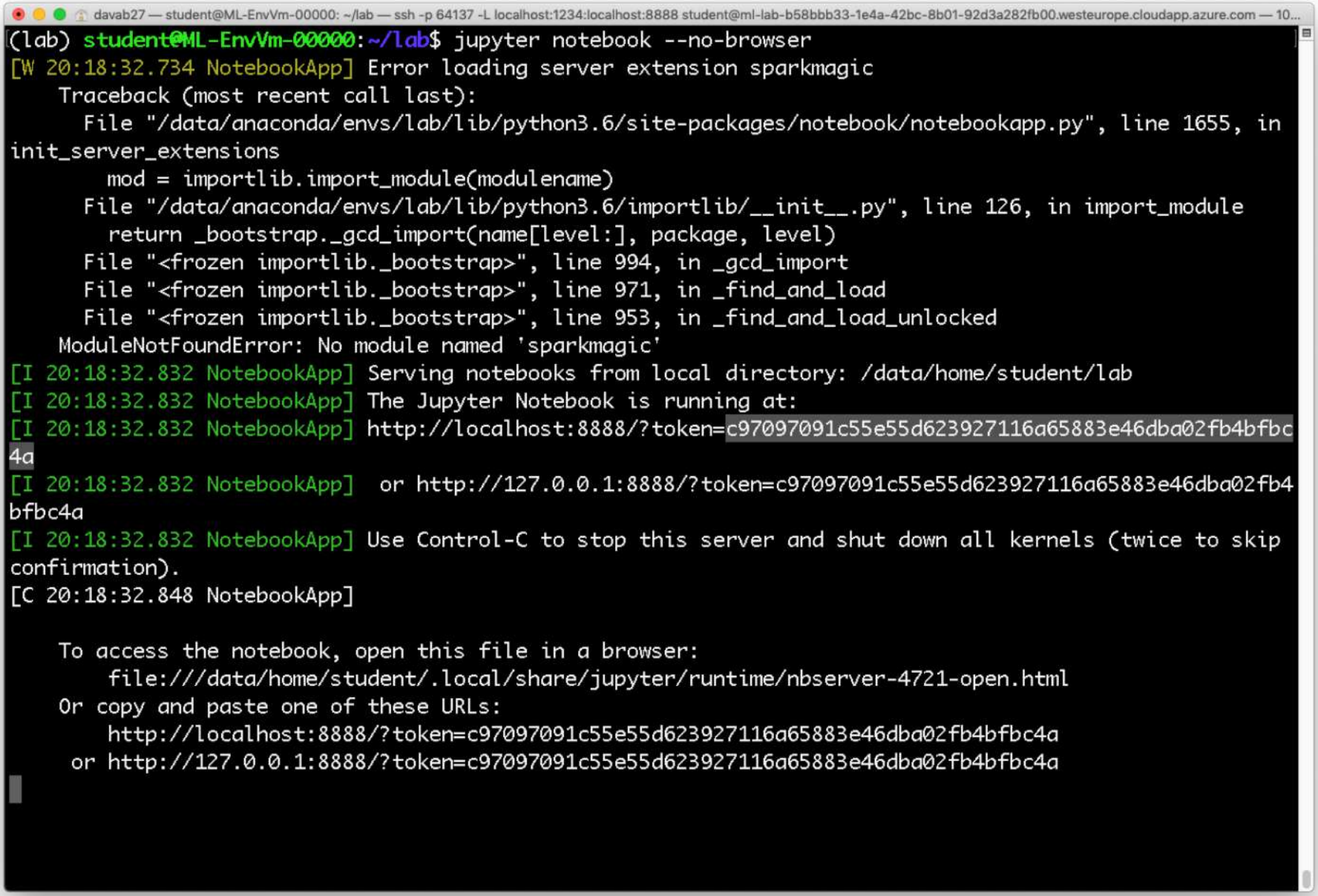

davab27 — student@ML-EnvVm-00000: ~/lab — ssh -p 64137 -L localhost:1234:localhost:8888 student@ml-lab-b58bbb33-1e4a-42bc-8b01-92d3a282fb00.westeurope.cloudapp.azure.com — 10...
student@ML-EnvVm-00000:~/lab$ wget -O seg_lab.zip https://tiny.cc/vxt7gz
--2019-12-03 20:13:22-- https://tiny.cc/vxt7gz
Resolving tiny.cc... 192.241.240.89
Connecting to tiny.cc|192.241.240.89|:443... connected.
HTTP request sent, awaiting response... 303 See Other
Location: https://liuonline-my.sharepoint.com/:u:/g/personal/davab27_liu_se/ESibIRhFBoZFt07YBsvwt9QBlDQfyFC_py9Q8SpF3hRQmA?download=1 [following]
--2019-12-03 20:13:22-- https://liuonline-my.sharepoint.com/:u:/g/personal/davab27_liu_se/ESibIRhFBoZFt07YBsvwt9QBlDQfyFC_py9Q8SpF3hRQmA?download=1
Resolving liuonline-my.sharepoint.com... 40.108.160.43
Connecting to liuonline-my.sharepoint.com|40.108.160.43|:443... connected.
HTTP request sent, awaiting response... 302 Found
Location: /personal/davab27_liu_se/Documents/seg_lab.zip?&originalPath=aHR0cHM6Ly9saXVvbmxpbmUtbXkuc2hhcmVwb2ludC5jb20vOnU6L2cvcGVyc29uYWwvZGF2YWIyN19saXVfc2UvRVNpYklSaEZCb1pGdDA3WUJzdnd0OVFCbERRZnlGQ19weTlR0FNwRjNoUlFtQT9ydGltZT1EVTZVUHkxNDEwZw [following]
--2019-12-03 20:13:23-- https://liuonline-my.sharepoint.com/personal/davab27_liu_se/Documents/seg_lab.zip?&originalPath=aHR0cHM6Ly9saXVvbmxpbmUtbXkuc2hhcmVwb2ludC5jb20vOnU6L2cvcGVyc29uYWwvZGF2YWIyN19saXVfc2UvRVNpYklSaEZCb1pGdDA3WUJzdnd0OVFCbERRZnlGQ19weTlR0FNwRjNoUlFtQT9ydGltZT1EVTZVUHkxNDEwZw
Reusing existing connection to liuonline-my.sharepoint.com:443.
HTTP request sent, awaiting response... 200 OK
Length: 27292866 (26M) [application/x-zip-compressed]
Saving to: 'seg_lab.zip'
seg_lab.zip 100%[=====>] 26.03M 80.9MB/s in 0.3s
2019-12-03 20:13:23 (80.9 MB/s) - 'seg_lab.zip' saved [27292866/27292866]
student@ML-EnvVm-00000:~/lab$


davab27 — student@ML-EnvVm-00000: ~/lab — ssh -p 64137 -L localhost:1234:localhost:8888 student@ml-lab-b58bbb33-1e4a-42bc-8b01-92d3a282fb00.westeurope.cloudapp.azure.com — 10...
student@ML-EnvVm-00000:~/lab$ unzip seg_lab.zip
Archive: seg_lab.zip
   creating: Data/
   creating: Data/Masks/
  inflating: Data/Masks/mask9.png
  inflating: Data/Masks/mask8.png
 extracting: Data/Masks/mask7.png
 extracting: Data/Masks/mask6.png
  inflating: Data/Masks/mask60.png
 extracting: Data/Masks/mask5.png
  inflating: Data/Masks/mask59.png
  inflating: Data/Masks/mask58.png
  inflating: Data/Masks/mask57.png
  inflating: Data/Masks/mask56.png
 extracting: Data/Masks/mask55.png
  inflating: Data/Masks/mask54.png
  inflating: Data/Masks/mask53.png
 extracting: Data/Masks/mask52.png
  inflating: Data/Masks/mask51.png
  inflating: Data/Masks/mask50.png
  inflating: Data/Masks/mask4.png
  inflating: Data/Masks/mask46.png
  inflating: Data/Masks/mask44.png
  inflating: Data/Masks/mask43.png
  inflating: Data/Masks/mask42.png
  inflating: Data/Masks/mask41.png
  inflating: Data/Masks/mask40.png
  inflating: Data/Masks/mask3.png
 extracting: Data/Masks/mask39.png
  inflating: Data/Masks/mask38.png
  inflating: Data/Masks/mask37.png
Extract the data.

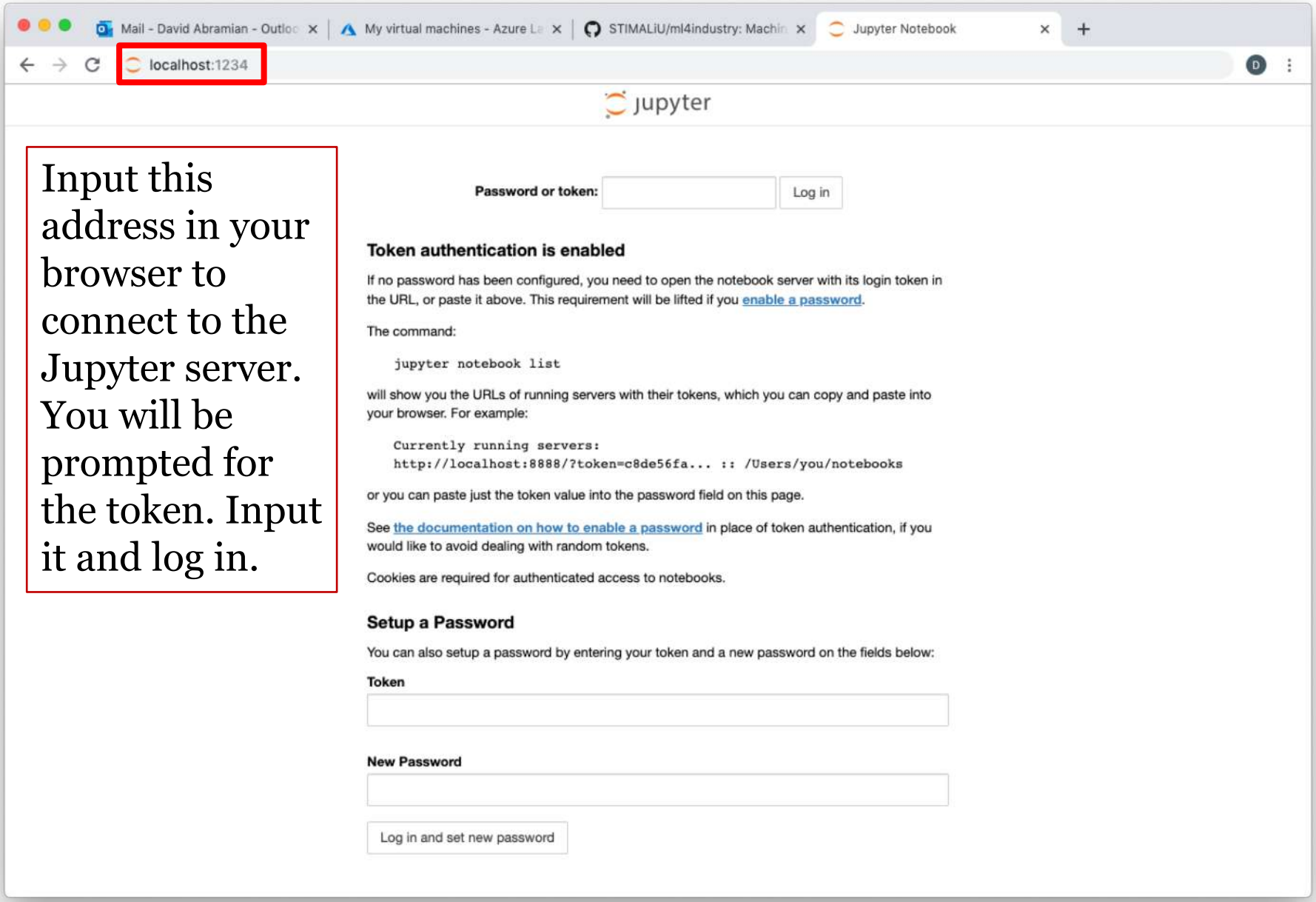

davab27 — student@ML-EnvVm-00000: ~/lab — ssh -p 64137 -L localhost:1234:localhost:8888 student@ml-lab-b58bbb33-1e4a-42bc-8b01-92d3a282fb00.westeurope.cloudapp.azure.com — 10...
student@ML-EnvVm-00000:~/lab$ conda env create -f env.yml
Create an Anaconda environment for the lab. This will Python and all the required packages.


davab27 — student@ML-EnvVm-00000: ~/lab — ssh -p 64137 -L localhost:1234:localhost:8888 student@ml-lab-b58bbb33-1e4a-42bc-8b01-92d3a282fb00.westeurope.cloudapp.azure.com — 10...
student@ML-EnvVm-00000:~/lab$ conda env create -f env.yml
Collecting package metadata (repodata.json): done
Solving environment: done
Downloading and Extracting Packages
pygments-2.5.2 | 672 KB | ########## | 100%
ca-certificates-2019 | 132 KB | ########## | 100%
prompt_toolkit-3.0.2 | 234 KB | ########## | 100%
importlib_metadata-1 | 45 KB | ########## | 100%
certifi-2019.11.28 | 156 KB | ########## | 100%
jupyter_console-5.2. | 37 KB | ########## | 100%
setuptools-42.0.2 | 653 KB | ########## | 100%
Preparing transaction: done
Verifying transaction: / channel 3: open failed: connect failed: Connection refused
channel 3: open failed: connect failed: Connection refused
done
Executing transaction: done
#
To activate this environment, use
#
$ conda activate lab
#
To deactivate an active environment, use
#
$ conda deactivate
student@ML-EnvVm-00000:~/lab$
It will take a while. You may see many more downloaded packages.

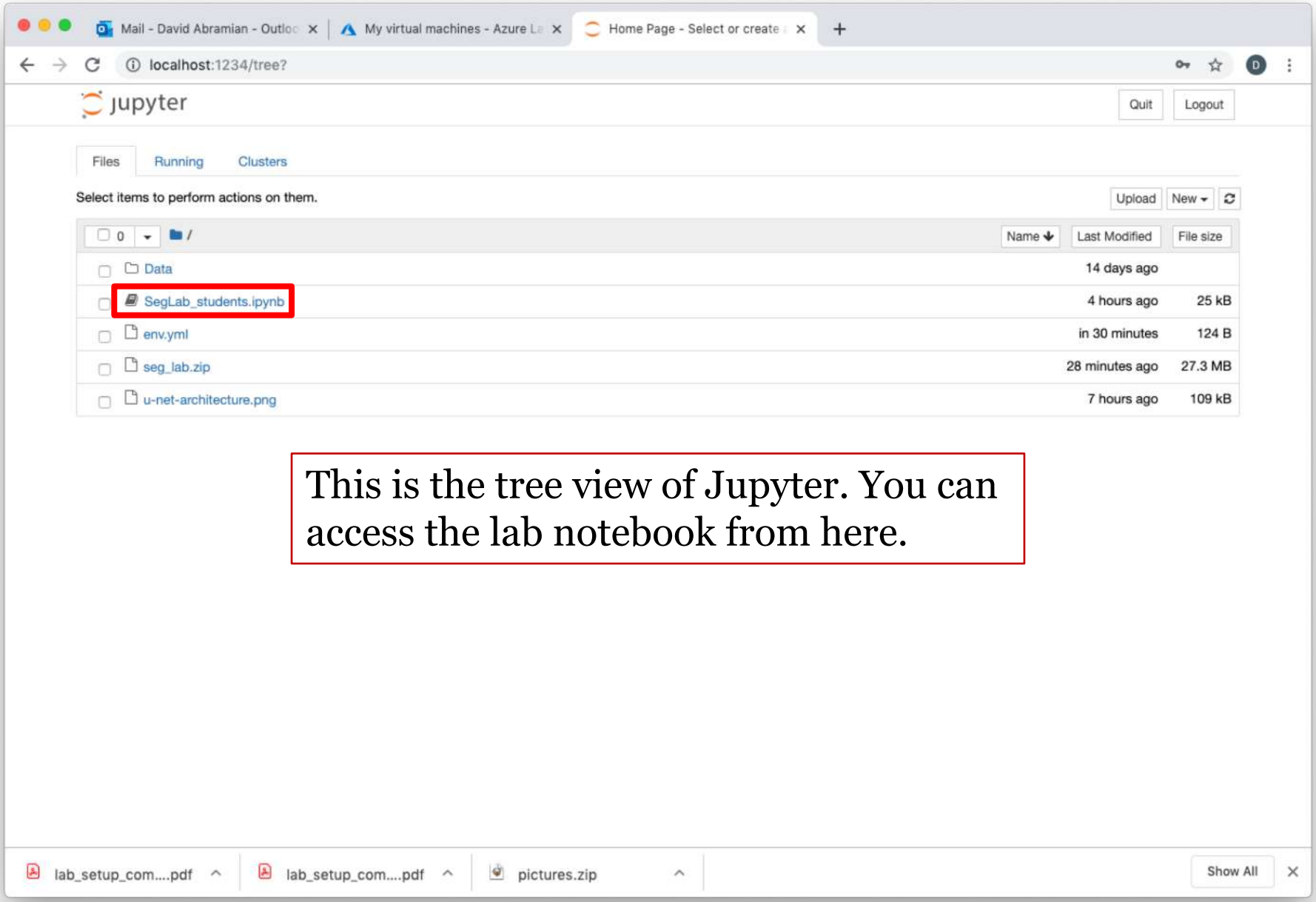

davab27 — student@ML-EnvVm-00000: ~/lab — ssh -p 64137 -L localhost:1234:localhost:8888 student@ml-lab-b58bbb33-1e4a-42bc-8b01-92d3a282fb00.westeurope.cloudapp.azure.com — 10...
student@ML-EnvVm-00000:~/lab$ conda activate lab
(lab) student@ML-EnvVm-00000:~/lab$
Start the Anaconda environment.
Note the change in the prompt.

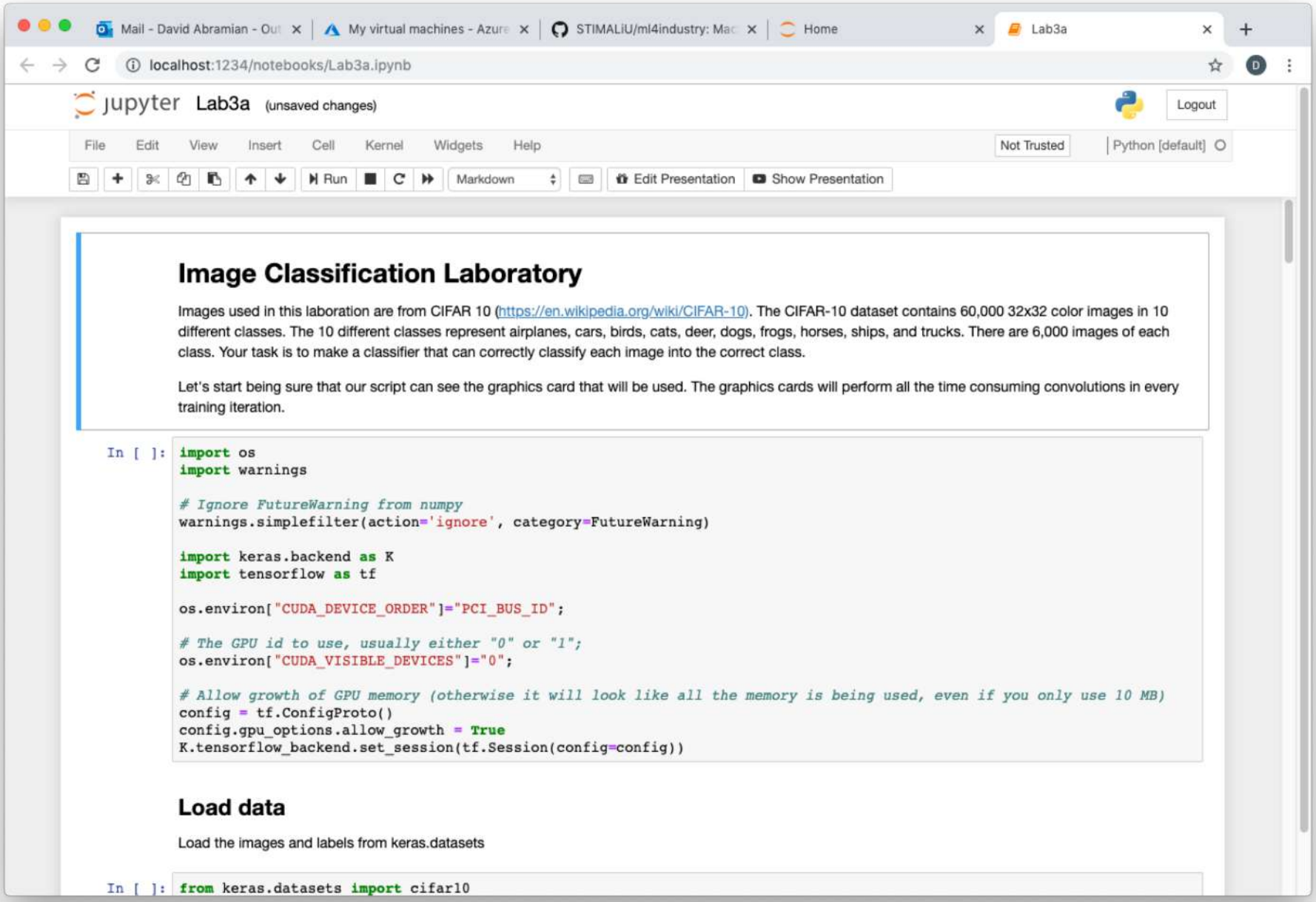


Start a Jupyter server. This is the Python editor we will use. Note the highlighted token. Be careful not to try to copy it with Ctrl + C or you will stop the server (Cmd + C in Mac is fine). Highlighting it with PuTTY should copy it.



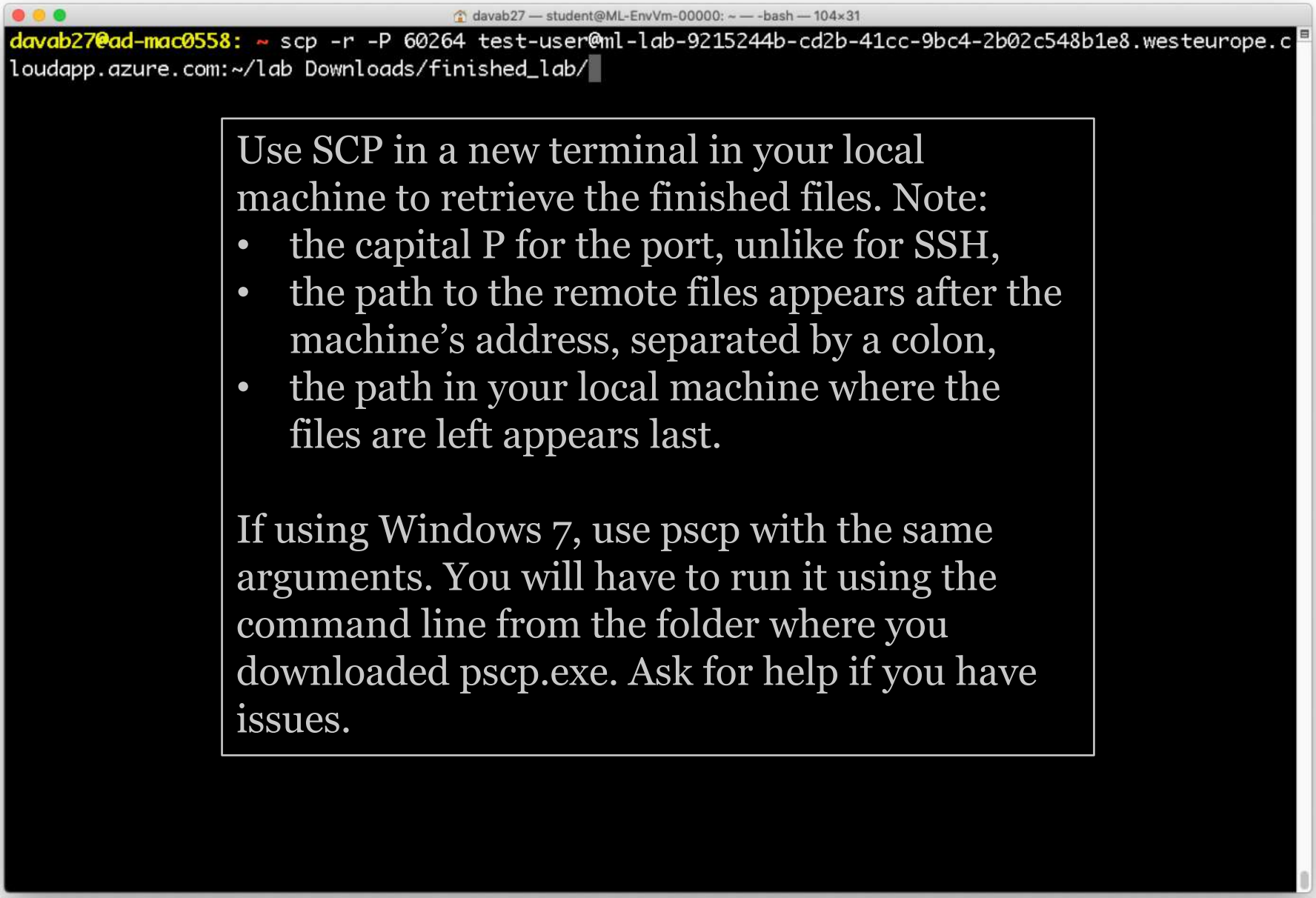
Input this address in your browser to connect to the Jupyter server. You will be prompted for the token. Input it and log in.


Mail - David Abramian - Outlo
My virtual machines - Azure La
Home Page - Select or create
localhost:1234/tree?
jupyter
Quit
Logout
Files
Running
Clusters
Select items to perform actions on them.
Upload
New
0
/
Name
Last Modified
File size
Data
14 days ago
SegLab_students.ipynb
4 hours ago
25 kB
env.yml
in 30 minutes
124 B
seg_lab.zip
28 minutes ago
27.3 MB
u-net-architecture.png
7 hours ago
109 kB
This is the tree view of Jupyter. You can access the lab notebook from here.
lab_setup_com....pdf
lab_setup_com....pdf
pictures.zip
Show All



Open the notebook and work on it. All computations will run on the remote machine. Some of the initial commands may take a while to run.

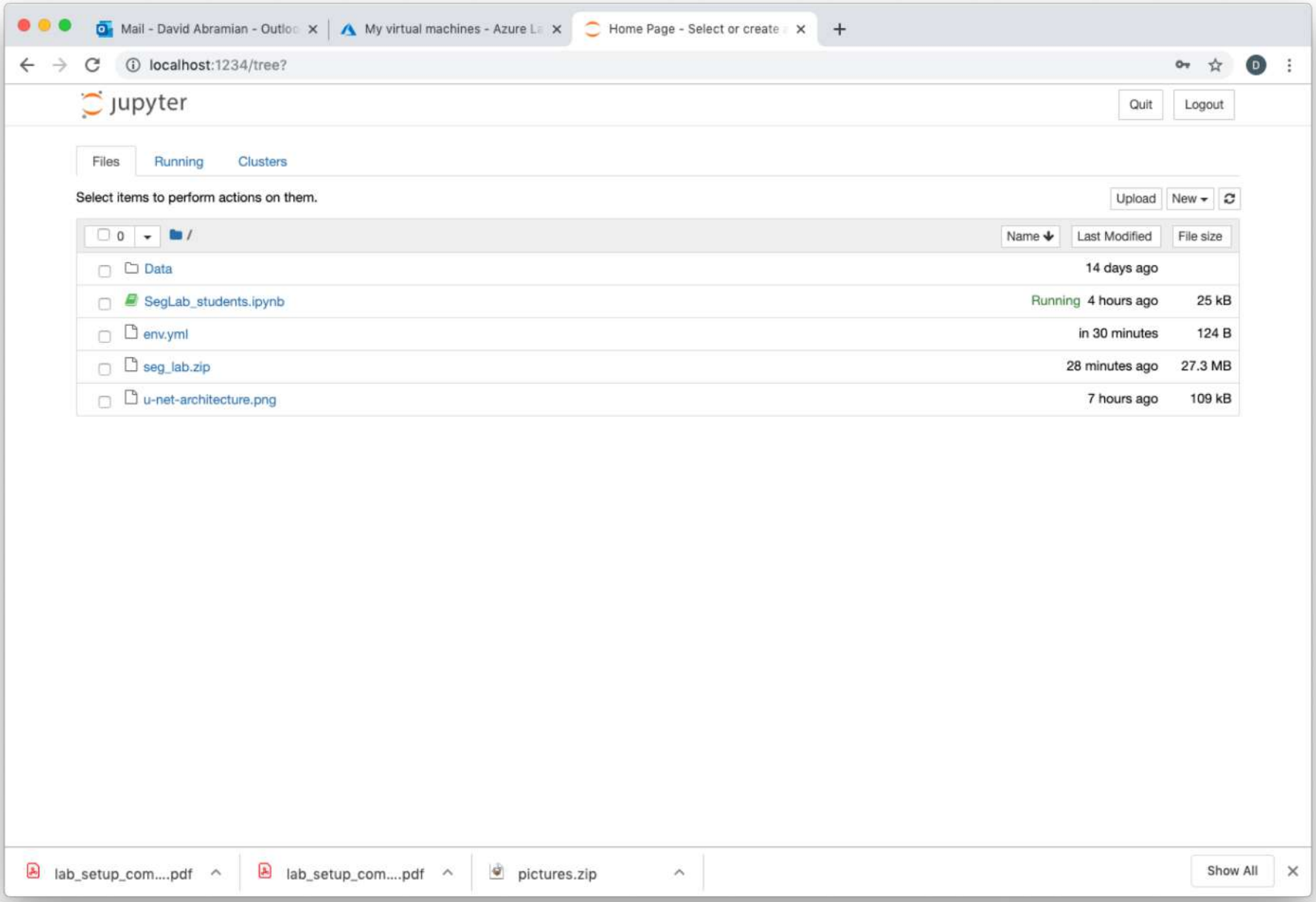
When you are done



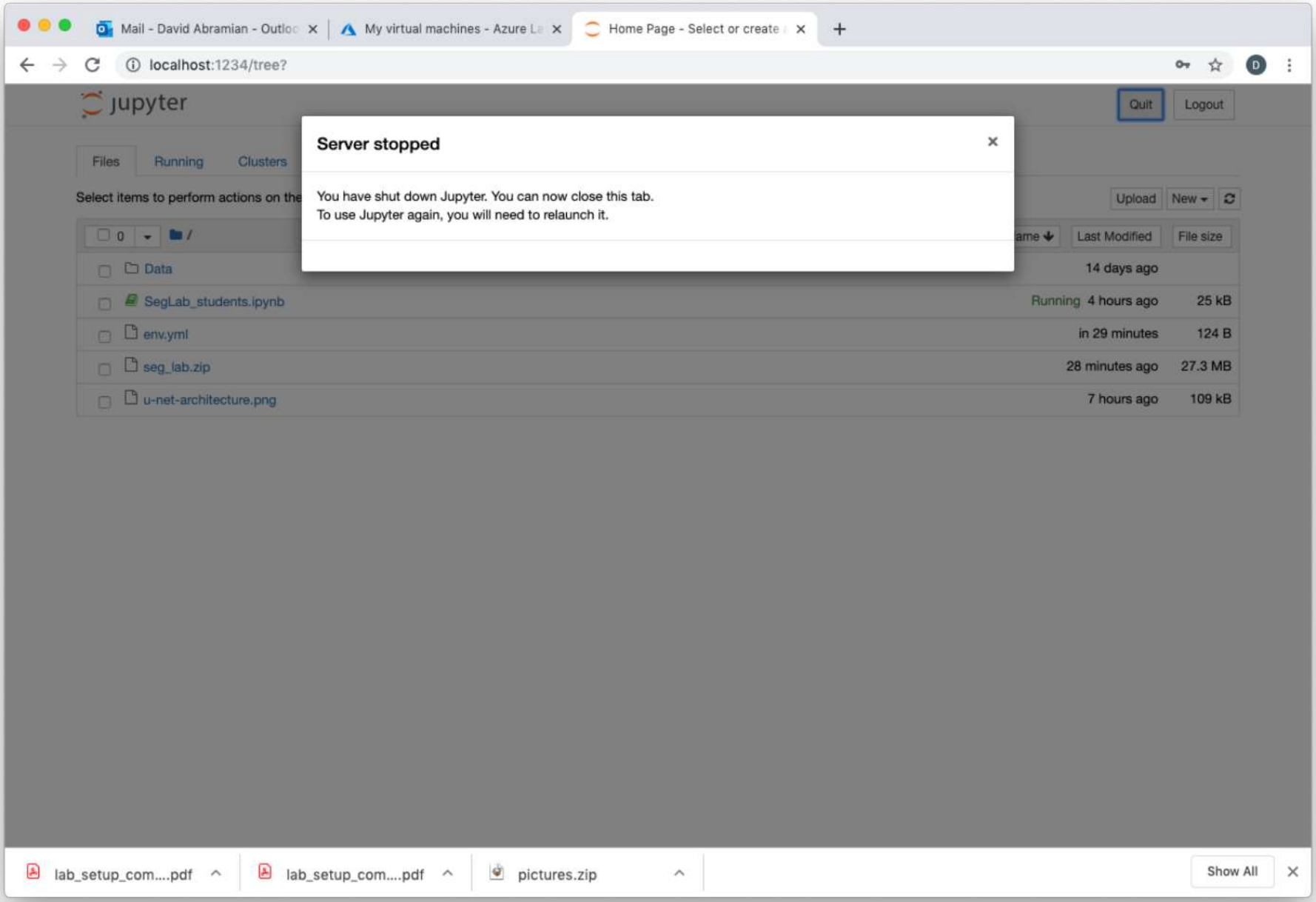
Use SCP in a new terminal in your local machine to retrieve the finished files. Note:

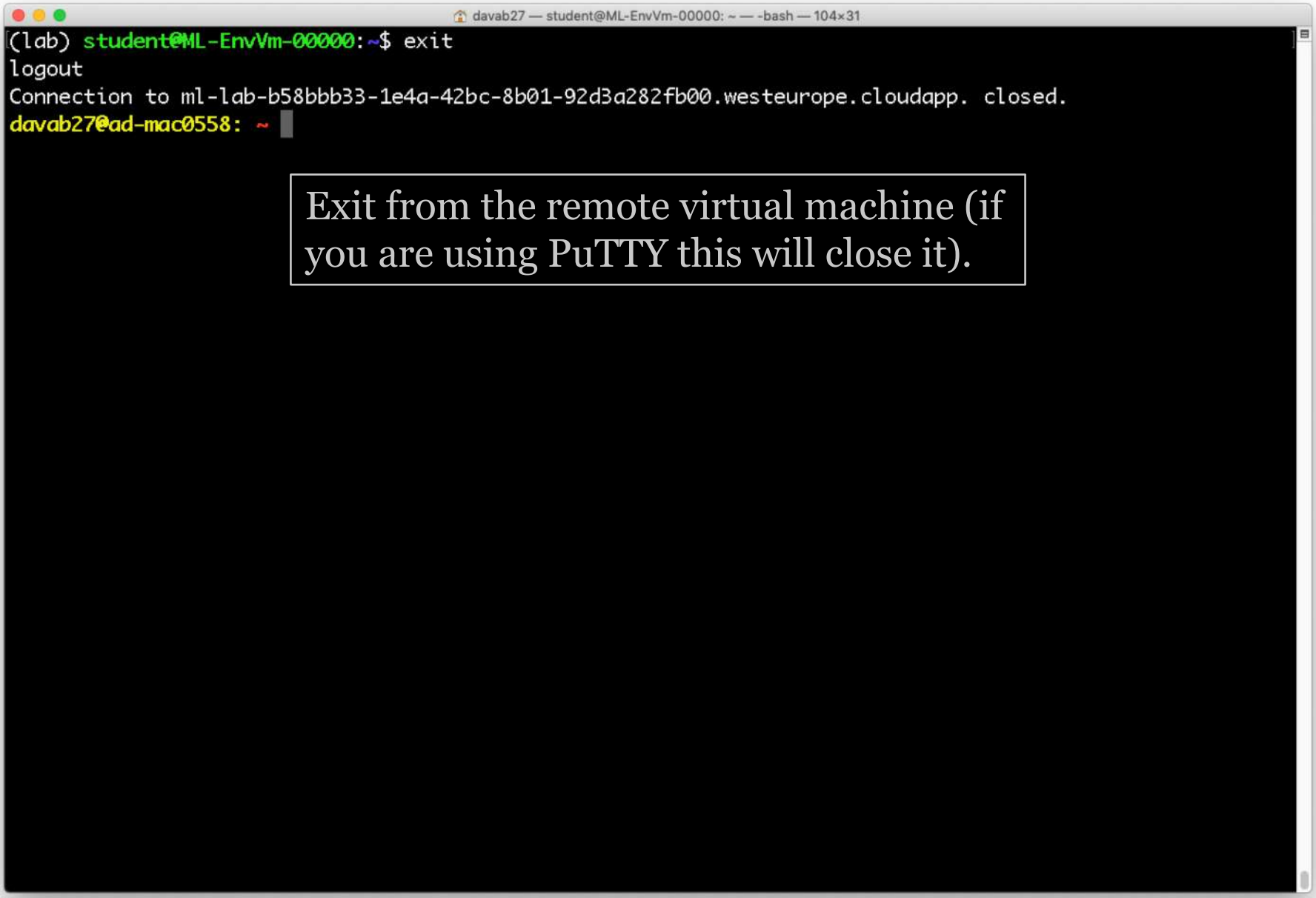
- the capital P for the port, unlike for SSH,
- the path to the remote files appears after the machine's address, separated by a colon,
- the path in your local machine where the files are left appears last.

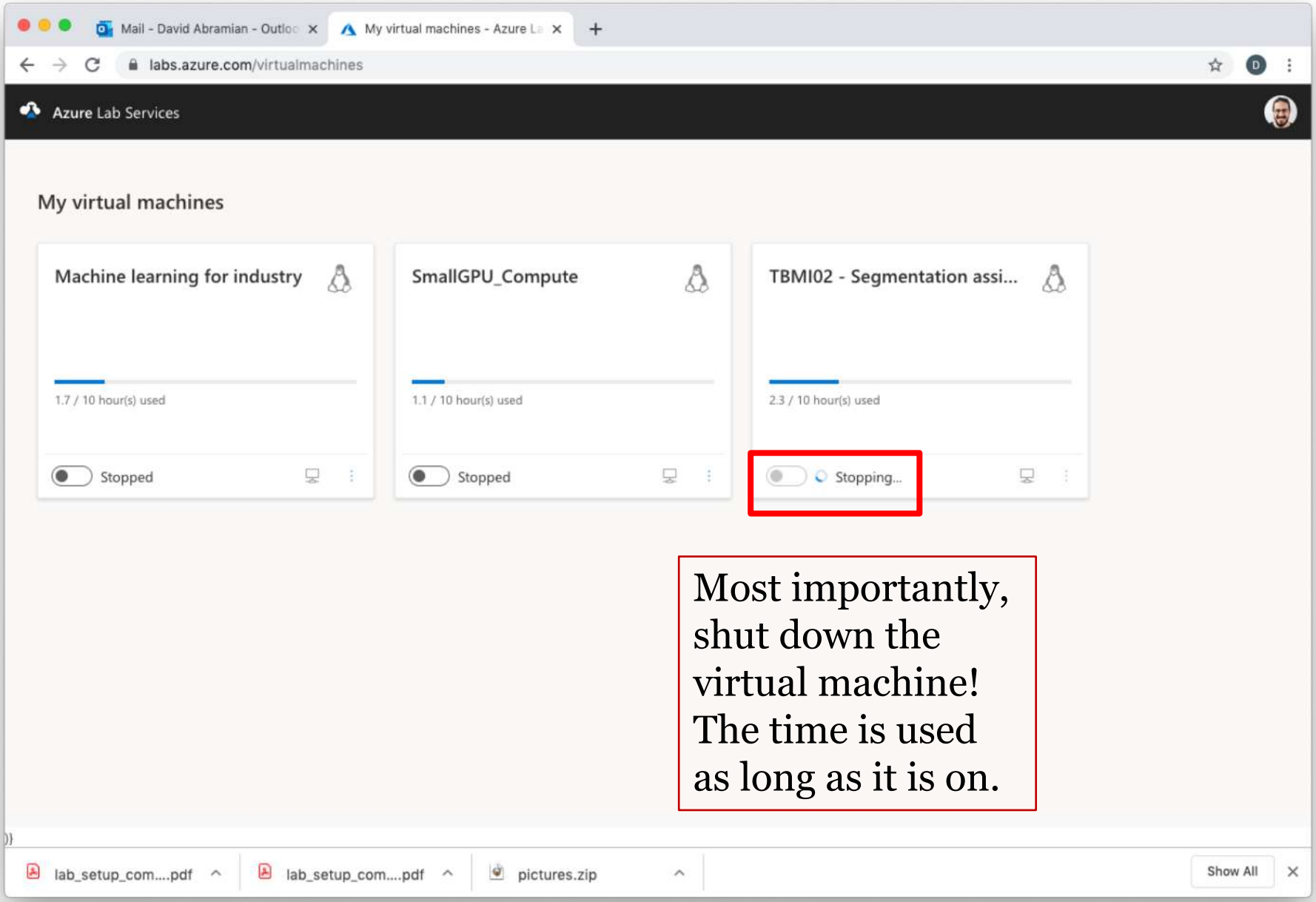
If using Windows 7, use pscp with the same arguments. You will have to run it using the command line from the folder where you downloaded pscp.exe. Ask for help if you have issues.



Shut down the Jupyter server by pressing Quit.


Mail - David Abramian - Outloc
My virtual machines - Azure Le
Home Page - Select or create
localhost:1234/tree?
jupyter
Quit
Logout
Server stopped
You have shut down Jupyter. You can now close this tab.
To use Jupyter again, you will need to relaunch it.
Files
Running
Clusters
Select items to perform actions on the
Upload
New
Last Modified
File size
Data
14 days ago
SegLab_students.ipynb
Running 4 hours ago
25 kB
env.yml
in 29 minutes
124 B
seg_lab.zip
28 minutes ago
27.3 MB
u-net-architecture.png
7 hours ago
109 kB
lab_setup_com....pdf
lab_setup_com....pdf
pictures.zip
Show All


davab27 — student@ML-EnvVm-00000: ~ — -bash — 104×31
(lab) student@ML-EnvVm-00000:~$ exit
logout
Connection to ml-lab-b58bbb33-1e4a-42bc-8b01-92d3a282fb00.westeurope.cloudapp. closed.
davab27@ad-mac0558: ~
Exit from the remote virtual machine (if you are using PuTTY this will close it).


Mail - David Abramian - Outlo
My virtual machines - Azure La
labs.azure.com/virtualmachines
Azure Lab Services
My virtual machines
Machine learning for industry
1.7 / 10 hour(s) used
Stopped
SmallGPU_Compute
1.1 / 10 hour(s) used
Stopped
TBMI02 - Segmentation assi...
2.3 / 10 hour(s) used
Stopping...
Most importantly, shut down the virtual machine! The time is used as long as it is on.
lab_setup_com....pdf
lab_setup_com....pdf
pictures.zip
Show All