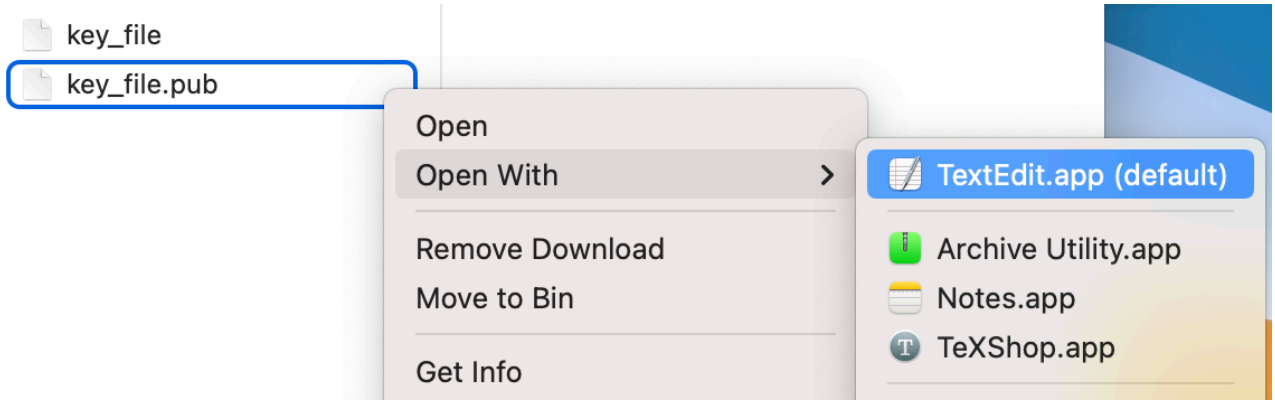
The following is a guide to use the GPU at Ucloud:

1) You will need to create a ssh key (to create a secure connection to the GPUs at Aalborg)
On a mac/linux you can do this like so: (You can always use a linux at Ucloud)

```
d37738:tmp au561649$ ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/Users/au561649/.ssh/id_rsa): key_file
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in key_file.
Your public key has been saved in key_file.pub.
The key fingerprint is:
SHA256:ZKS6fNSACK4fJIOfDIFGZfNZnmPCfjB2EXyRME1boI0 au561649@d37738.eduroam.net.a
u.dk
The key's randomart image is:
+---[RSA 3072]----+
|=..+  .**++.     |
|++..+.++B+o      |
|*.o .OoE+o       |
|.B .o.*=.        |
|. = ....S        |
| . o o.          |
|  . o .          |
|     .           |
|                 |
+----[SHA256]-----+
d37738:tmp au561649$
```

After this you can simply copy the content of the .pub file:



NOTE: When you copy this only include:

```
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABgQCiCXIDe0gofoRlsE4z4ucd5dw2IVfmGd0UW/
DMu+VyiOCxut9WDvOjwqYF88WyDvepA4GaLGOT5Yf5EQNeaIB0CZKyz7LFKRuVqNxNw6e6ujmuzZIUq9Sqqla3JRmotQ2sGKud+cIFkfH65058182K
uYTM80FAwXPaTP589Wuf4vMRdV5PqXI/UO8eSdo2+IOy2baXGaOXs2bZO8CExm770RmeWBUxGlLQlmqQ3yJgz4OPTMvcmKbmSkRQAZXM2Ye/i39/
tNv4GEUe0vhK0YTPGzzC+DjyHEIUYaZe5mRDhsnDmqMR1s0s0sBLcmOTAeZlKJQn85tGKN6eJjBnkbAI1DdO+ZOOdNUhg1yUn1Utmj9tQ1AJjO/
yHldb173w/TZy/NoDou/UX77O9Zq+CYIxHi8F2IJ32I+s6jQ6X+y8qAdRKftjzokgYRQAo6/Qd6bsXFWBvjIigJSgvfmFm3Y4/
xt5ZhCjwWrT7LGF2rrSg76FsERRcfHL7sMvEIAHx3s=
```

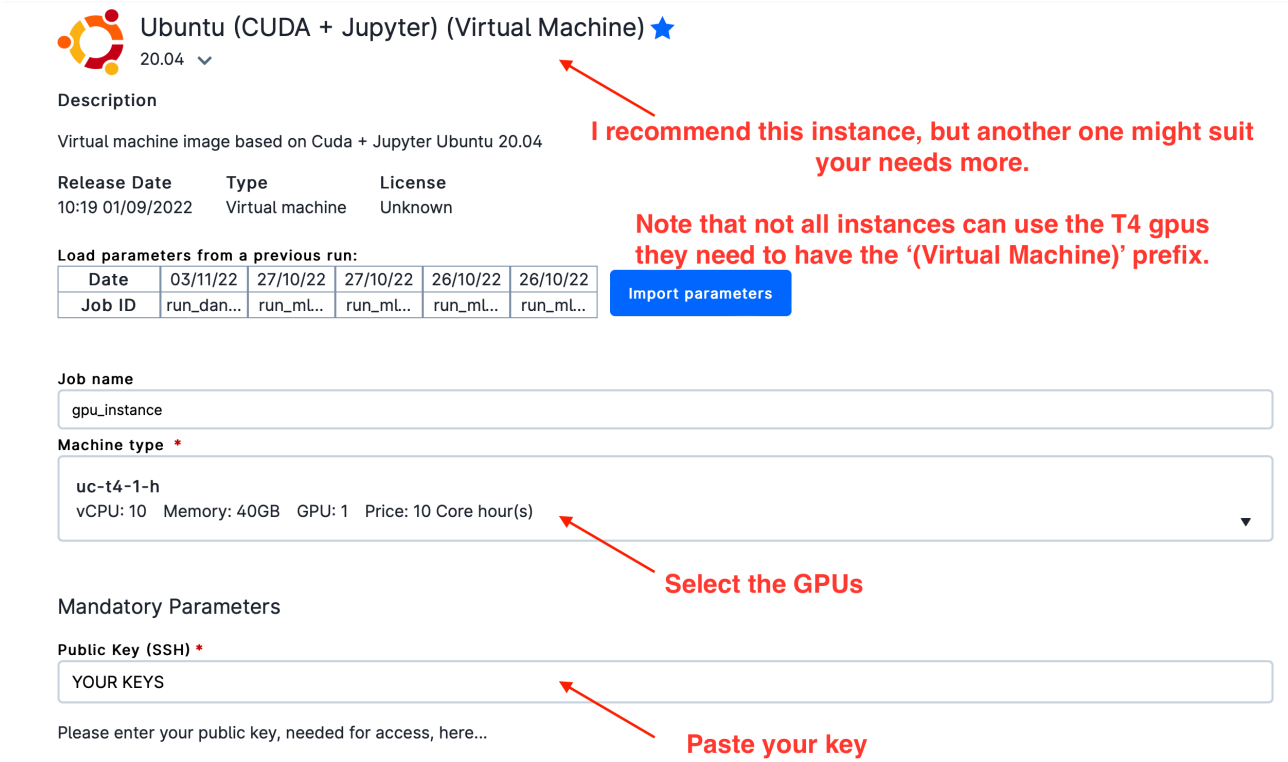
and not:

```
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABgQCiCXIDe0gofoRlsE4z4ucd5dw2IVfmGd0UW/
DMu+VyiOCxut9WDvOjwqYF88WyDvepA4GaLGOT5Yf5EQNeaIB0CZKyz7LFKRuVqNxNw6e6ujmuzZIUq9Sqqla3JRmotQ2sGKud+cIFkfH65058182K
uYTM80FAwXPaTP589Wuf4vMRdV5PqXI/UO8eSdo2+IOy2baXGaOXs2bZO8CExm770RmeWBUxGlLQlmqQ3yJgz4OPTMvcmKbmSkRQAZXM2Ye/i39/
tNv4GEUe0vhK0YTPGzzC+DjyHEIUYaZe5mRDhsnDmqMR1s0s0sBLcmOTAeZlKJQn85tGKN6eJjBnkbAI1DdO+ZOOdNUhg1yUn1Utmj9tQ1AJjO/
```

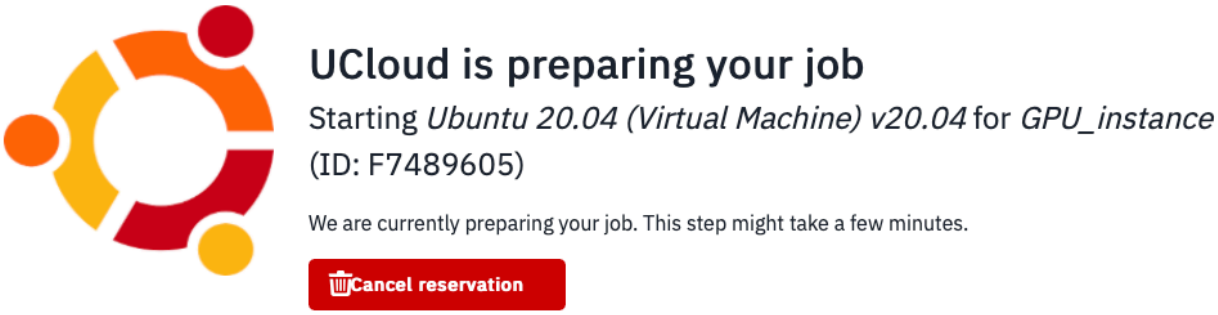
```
yHldb173w/TZy/NoDou/UX77O9Zq+CYIxHi8F2IJ32I+s6jQ6X+y8qAdRKftjzokgYRQAo6/Qd6bsXFWBvjIigJSgvfmFm3Y4/
xt5ZhCjwWrT7LGF2rrSg76FsERRcfHL7sMvEIAHx3s= au561649@d37738.local
```

(notice the last part with my user ID)

Insert into Ucloud:



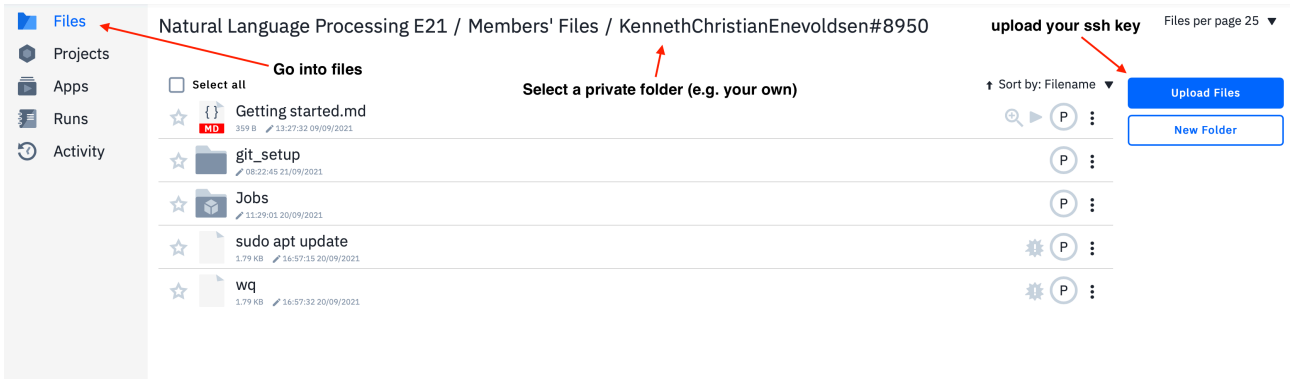
Then you just have to wait for access (takes a while, please be patient).

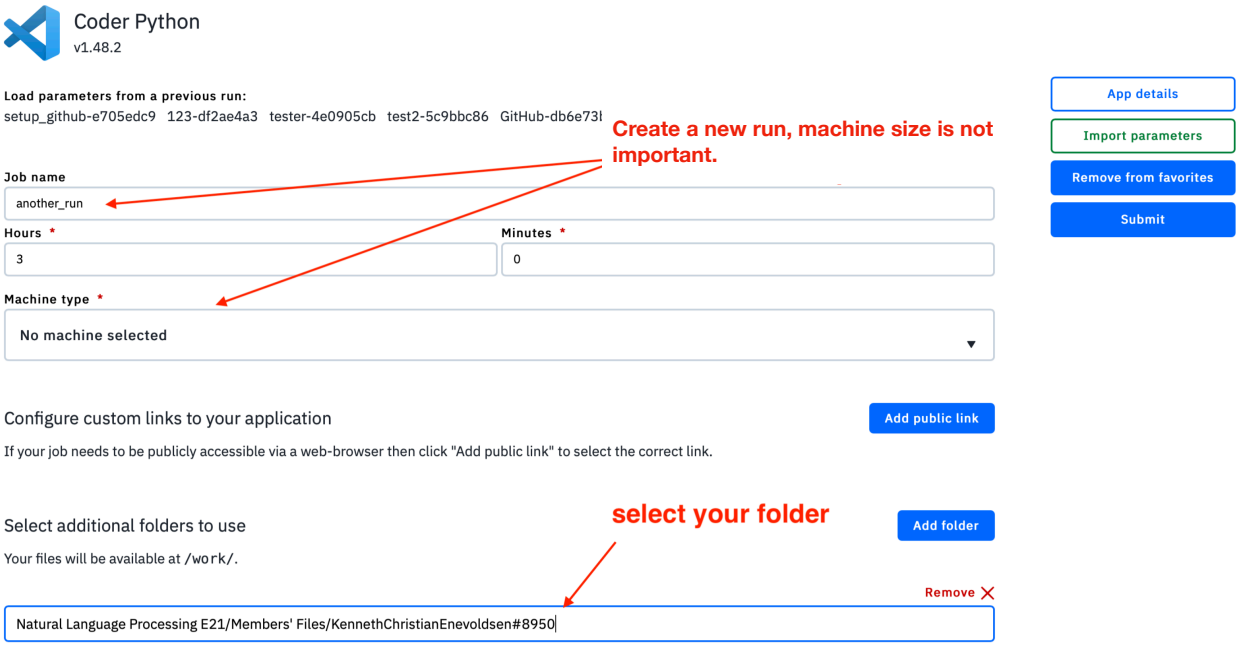


2) After this, what we want to do it connect to the GPU. We will use this using a news run on Ucloud (so that everyone can follow along), but it is likely that you can simply connect from you own computer instead.

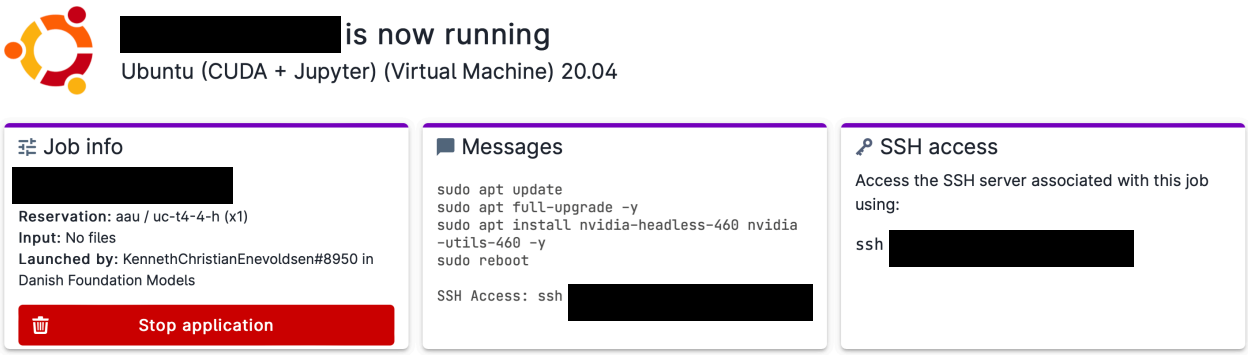
Note: that at the time (Nov. 2022) of writing connection for the Aarhus University network is currently blocked (we are working on resolving this issue).

We will connect to the GPU job using the ssh key. Therefore we first need to upload the shh key you created at the beginning. For this we create a new instance (using your code interface of choice):


Files
Projects
Apps
Runs
Activity
Natural Language Processing E21 / Members' Files / KennethChristianEnevoldsen#8950
Go into files
Select a private folder (e.g. your own)
upload your ssh key
Files per page 25
Select all
Sort by: Filename
Upload Files
New Folder
Getting started.md
git_setup
Jobs
sudo apt update
wq


Coder Python
v1.48.2
Load parameters from a previous run:
setup_github-e705edc9 123-df2ae4a3 tester-4e0905cb test2-5c9bbc86 GitHub-db6e73l
Create a new run, machine size is not important.
App details
Import parameters
Remove from favorites
Submit
Job name
another_run
Hours *
3
Minutes *
0
Machine type *
No machine selected
Configure custom links to your application
Add public link
If your job needs to be publicly accessible via a web-browser then click "Add public link" to select the correct link.
Select additional folders to use
select your folder
Add folder
Your files will be available at /work/.
Remove
Natural Language Processing E21/Members' Files/KennethChristianEnevoldsen#8950

when that is up and running check your GPU job, you should see something like this:

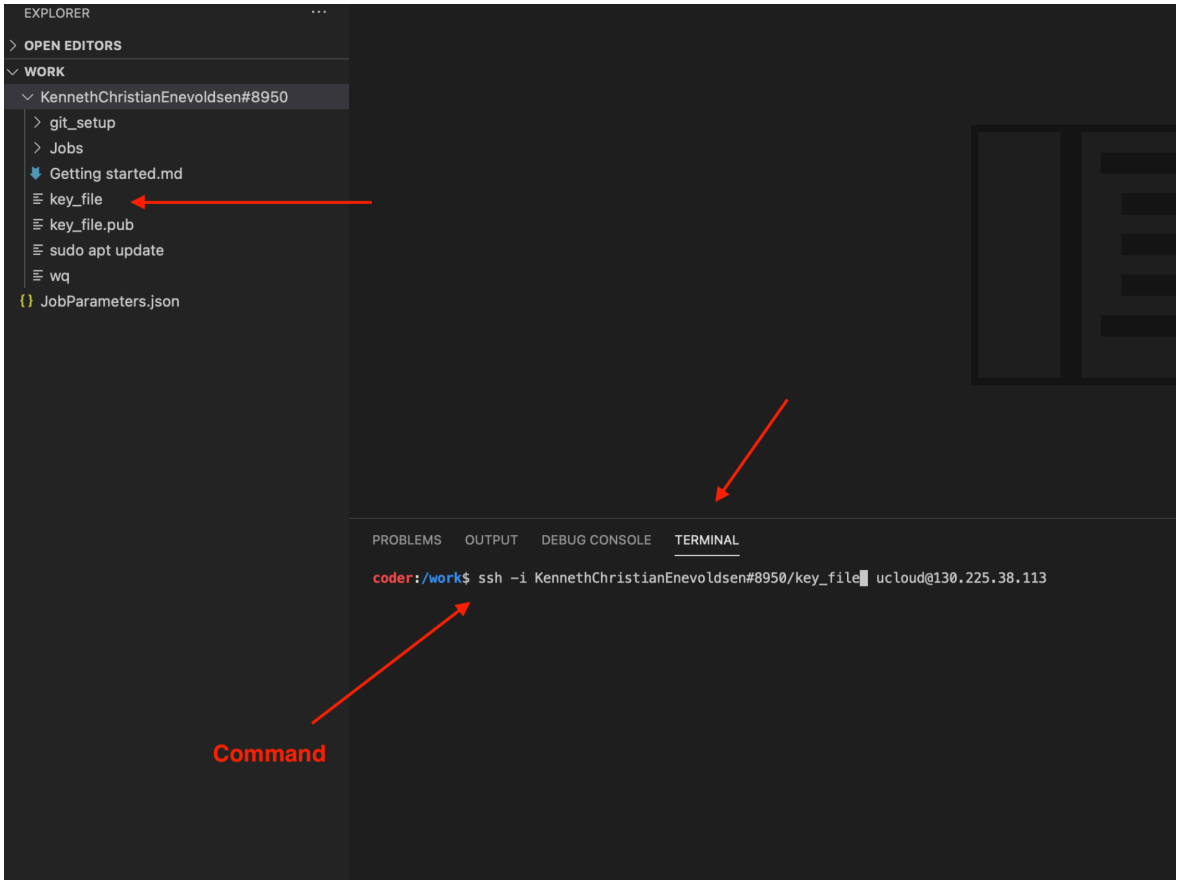


Especially note the message:

sudo apt update
sudo apt full-upgrade -y
sudo apt install nvidia-headless-460 nvidia-utils-460 -y
sudo reboot

SSH Access: ssh ucloud@**<SERVER-ID>**

Now connect you can connect to the GPU using:
`ssh -i ~/path_to_key/custom_key_name SYSUSER@x.x.x.x`
(If there is a problem here check the FAQ)
e.g.:



Then follow the instructions in in the message:

```
sudo apt update
sudo apt full-upgrade -y
sudo apt install nvidia-headless-460 nvidia-utils-460 -y
sudo reboot
```

Then you should be able to work from there.

3) After you reboot you will be disconnected, simply connect using ssh command from above.

FAQ

1) Unprotected private key file

Some might get a problem like:

```
coder:/work$ ssh -i [redacted]#8577/key_file ucloud@[redacted]

@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
@         WARNING: UNPROTECTED PRIVATE KEY FILE!          @
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
Permissions 0640 for 'PernilleH\303\270jlundBrams#8577/key_file' are too
open.
It is required that your private key files are NOT accessible by others.
This private key will be ignored.
Load key "[redacted]/key_file": bad permissions
ucloud@[redacted] Permission denied (publickey).
```

There is some potential problems here:
1) you are using the key_file.pub instead of key_file
2) other people have access to your file. You can fix this using (changes access to file):

```
chmod 400 path/to/key_file
```

2) How to move files to and from the GPU?

You can move files from your CPU to your GPU using scp:

```
# move data to GPU from ucloud:
scp -r model_folder user@server.dk:gpu_model_folder
```

Or from the GPU to the instance you are connecting from:

```
# move data from GPU to Ucloud:
scp -r user@server.dk:data_folder location_folder_on_local
```

So the format is: scp FROM LOCATION

3) How do I navigate form the terminal?

A good place to start is using the three commands:

```
ls #print files in current folder
ls path/to/folder #print files in the desired folder
```

```
pwd # Print current Working Directory
```

```
cd path/to/folder #change current folder to the desired folder
```

4) Can’t access my files:

They are likely not on the GPU, check FAQ 3) on how to check if the files are on the GPU and 2) on how to move them to the GPU.