



# Virtual Machine and how to use the exercise documents

This document describes how to use the exercise documents and how to connect to the virtual machine that you will be working on in the practical exercises.

1. [How to use these exercise documents](#)
2. [The virtual machines](#)

## 1. How to use these exercise documents

---

The first thing to notice is that there are links to the different sections in the exercise at the top of each exercise together with a short introduction to the exercise

You will also find links to external web sites describing most of the tools you will be using throughout the exercises

You can copy and paste commands directly from this HTML and into your terminal if you don't want to write the complete commands yourself

The commands are written in boxes like this

```
any command
```

File paths to data are also written like the commands, for example: `path/to/files`

The tilde (~) symbol means home directory, therefore `~/practical/` is the same as `/home/practical`

We try to write tool in **bold letters** and filenames in boxes like this `filename` , but we are only human...

The tasks you will be performing will be announced like this:

[I\] Read this line which is printed in blue](#)

You will be given questions throughout the exercises. The questions will be given like this:

? Can you read this?

The solution to the exercises is found below each question like this:

► **Solution** - Click to expand

Hints, notes and useful information are (often) put in cyan boxes like below:

💡 **Note:** Did you know that you cannot snore and dream at the same time.

The exercises will consist of several sub parts. A progress bar after each sub part will indicate how much is left of the exercise

**Progress tracker**

Part 1 finished

## NB!! IMPORTANT SHORTCUTS THAT WILL SAVE YOU LOTS OF TIME

- **Shortcut for copying from the web browser = ctrl + c**
- **Shortcut for pasting into the terminal = ctrl + c**

**ALTERNATIVELY:** Mark the text you want to copy (marking the text is equal to copy) and paste it by pressing the mid-mouse button

💡 **IMPORTANT NOTE:** Many of the analysis you will be running the next days are very compute intensive, even on a relative small dataset as the one you will be working with. Therefore, we have already run some of these analysis beforehand and made the results available to you on the virtual machine (VM). **It will be described in all the exercises when you should use the prerun results.**

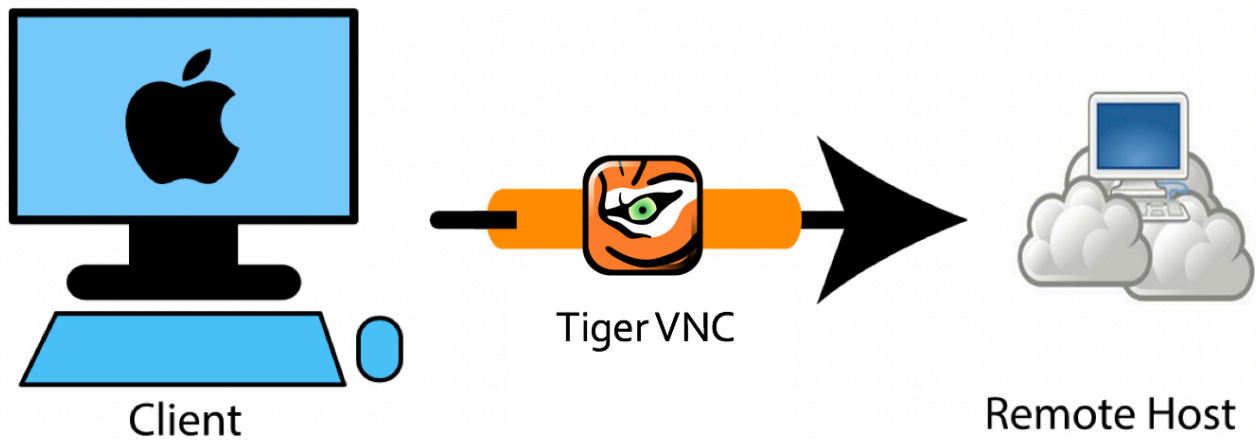
You could still try to run the analysis yourself. The tools are installed on the VM, but they will require a lot of resources and slow all other processes down. On tip: you can start an analysis just to see that you are able to fill in the correct arguments, and stop it by pressing `Ctrl + z`

**Good luck with the exercises and have fun** 🙌😊🙌

## 2. The virtual machines

---

💡 Using a virtual machine (VM) enables us to encapsulate the course data and software in such a way that you don't have to depend on the computational resources on your local machine. The complete course, including tools and course data is installed on the VM we have set up for you. All the practical exercises that you will be working on will be run on the VM.



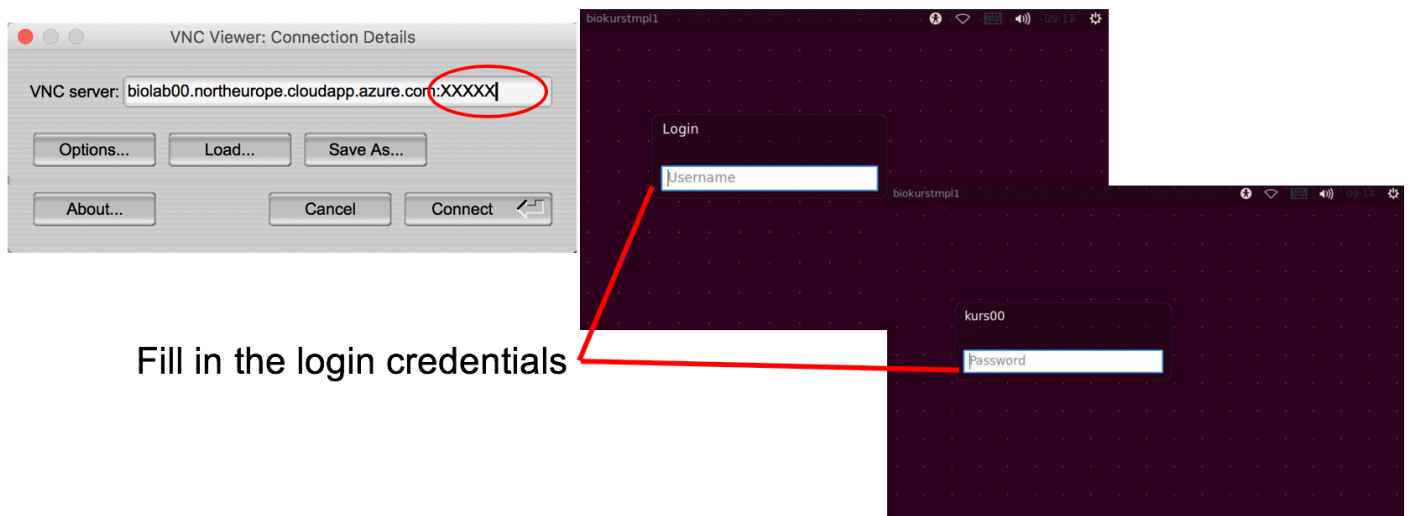
We have installed the remote desktop viewer **TigerVNC** on the computers in this lab. If you prefer to run the exercises on your own laptop, you need to install **TigerVNC**. **TigerVNC** allows you to access a remote computer (the VM), view the desktop on that machine and use it as if it was your own computer.

For a detailed description of **TigerVNC** and how to install the tools visit the [homepage](#).

## Logging on to the VM through the remote desktop viewer Tiger VNC

Address to VM: biolab00.northeurope.cloudapp.azure.com:XXXXXX

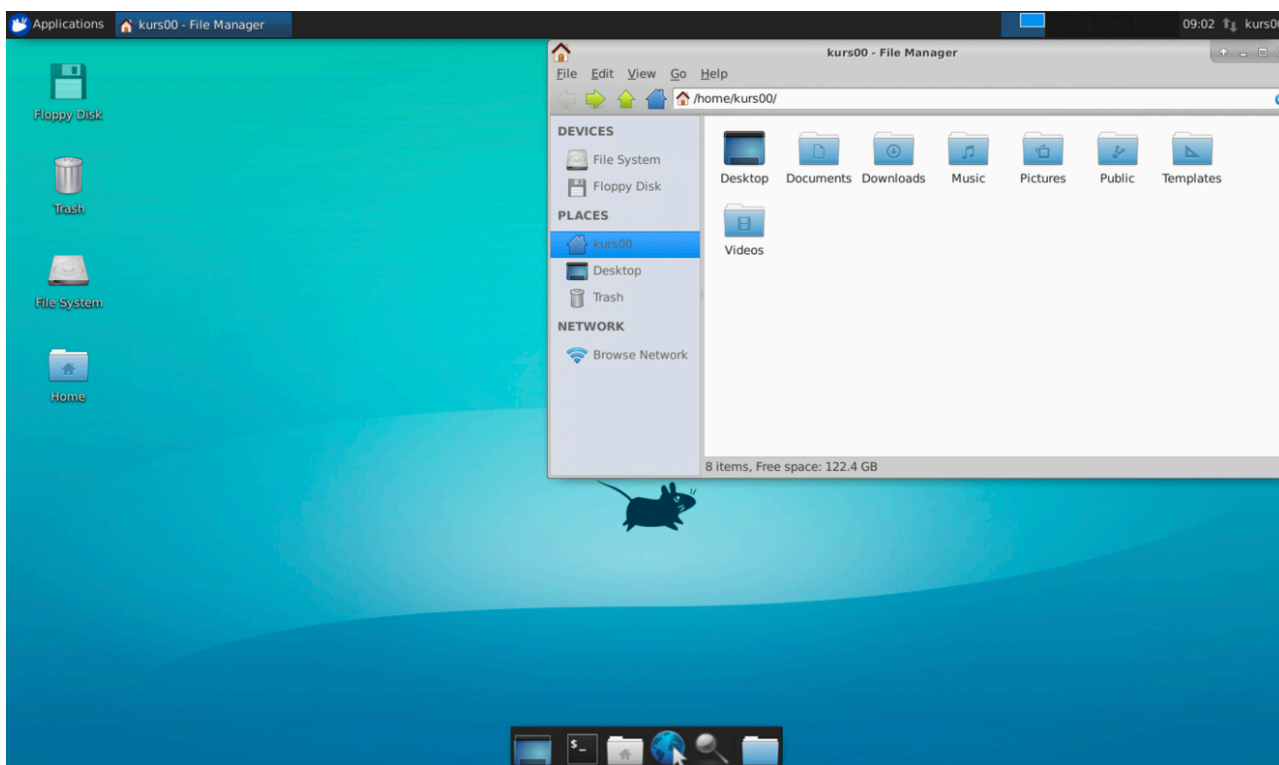
Replace the port number with using the login credentials found on the [EeLP](#)



Fill in the login credentials

## Getting familiar with the Ubuntu environment on the VM

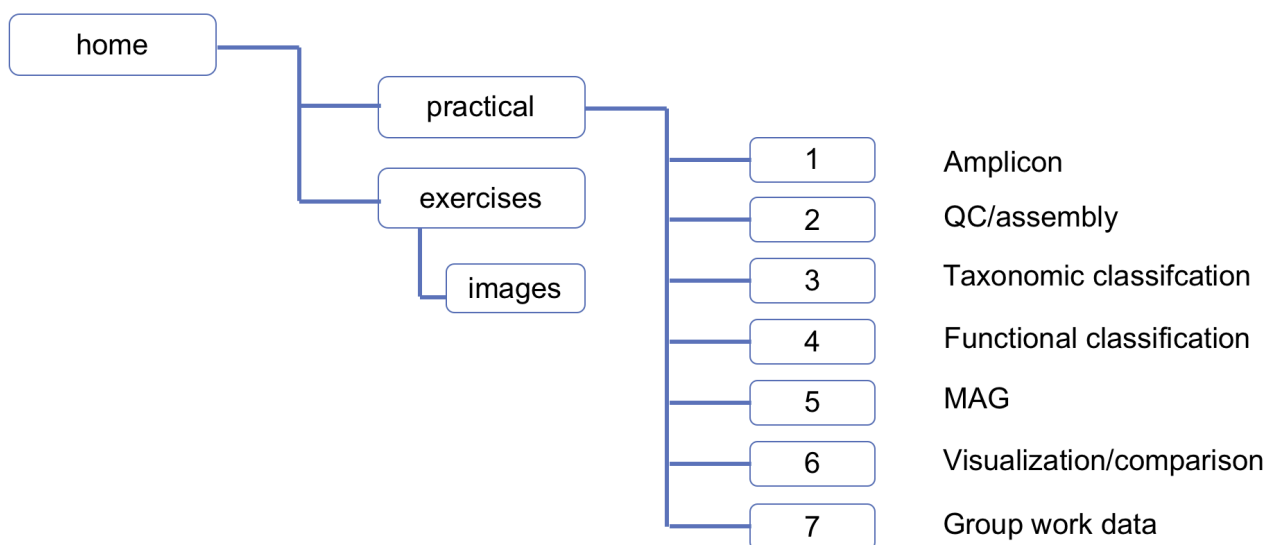
Once you are connected, you should see the desktop of the VM - and discover that it is similar to other OS with file browser etc.



## Course data

All the data you will be analysing during the practical exercises are located on a shared disk. You can access this disk by ...


The directories (linux equivalent of folder on a mac) and files are stored in an organized structure:



Note that the exercise descriptions are also located in the subdirectory `exercises`. For the practical exercises it is recommended that you open these HTML documents inside the VM (not on your local machine)

either directly from the `exercises` directory or from the EeLP, so that you can copy and paste the commands during the exercises into the terminal.

The first exercise in the **Linux practical exercise** will be to copy the directory `exercises` to your `home` directory.

 **IMPORTANT NOTE WHEN RUNNING TOOLS INSTALLED WITH CONDA** Conda is a package manager helps you find and install packages (tools and dependencies). Many tools on the VMs are installed in separate **Conda** environments. You will need to activate the environment the tool you are going to use is installed in. When you are finished using the tool in the environment, you need to deactivate the **Conda** environment (so other tools will work properly). This will be announced in the exercises.

You can list the **Conda** environments with the command:

```
conda env list

# conda environments:
#
base                *  /opt/SfB-course/anaconda2
Abricate            /opt/SfB-course/anaconda2/envs/Abricate
Checkm              /opt/SfB-course/anaconda2/envs/Checkm
Multiqc            /opt/SfB-course/anaconda2/envs/Multiqc
Plotting           /opt/SfB-course/anaconda2/envs/Plotting
QIIME2              /opt/SfB-course/anaconda2/envs/QIIME2
Roary              /opt/SfB-course/anaconda2/envs/Roary
Scoary             /opt/SfB-course/anaconda2/envs/Scoary
Snippy            /opt/SfB-course/anaconda2/envs/Snippy
```

In order to activate a **Conda**, for example `Checkm` environment:

```
conda activate name_of_environment
```

When activated, you will see that the prompt has changed to: `(Checkm) kursXX@kurslabXX:`

In order to deactivate the environment:

```
conda deactivate
```

When deactivated, you will see that the prompt has changed to: `kursXX@kurslabXX:`