4. User Manual - Student

This page contains User Instructions on how to use the JupyterHub environment on Lisa. This environment is hosted at surfsara.nl, using a typical URL https://jupyter.lisa.surfsara.nl/<coursename>.

Basic Topics

Receive login credentials

Before you start, you will receive an email containing your login-ID and a temporary password. The e-mail will look like the following:

From:	helpdesk@surfsara.nl
Subject:	SURFsara service for user: *******

Message:	Dear ****,
	
	Your password has been changed:
	        login: ****
	        password: ****
	
	We urge you to change your password as soon as possible. Use this method:
	 - point your web browser on:
	    https://portal.surfsara.nl/password
	
	We strongly advise NOT to use your former password.
	
	Questions and remarks can be send to helpdesk@surfsara.nl.
	
	        -The SURFsara System Administration

Alternatively, the login-ID and password may have been provided by your teacher.

First time setup

Before logging in, you will need to

- accept the Usage Agreement;
- change your temporary password.

Both can be done at https://portal.surfsara.nl/. Please select "Usage Agreement" or "Change Password" from the menu's on the left.

Logging in and Profile selection

Each course uses it's own Jupyter Hub. The Jupyter Hubs are running at https://jupyter.lisa.surfsara.nl/<coursename>. The <coursename> will be provided to you by your teacher.

After logging in, you will see the following screen:

You are now in the Jupyter Hub. The Jupyter Hub can be used to start a Jupyter Notebook server. To do this, there are two profiles:

- one '**outside course work**' (or '**homework**') **profile**
- one '**course**' **profile**.

The descriptions are quite self explanatory: the first one is meant for outside course hours, the others are meant to be used during course hours. To start a Jupyter Notebook server, select the desired profile, and click 'Start'.

Outside course hours, only a limited number of slots are available to start Jupyter Notebook servers. This means not all students can run Jupyter Notebooks at the same time. Usually, this should not be a problem, but if many other students are already working, trying to start your notebook may result in a timeout. If that happens, there are no more slots available, and you will have to wait until another student finishes his/her session.

All profiles intended for course hours start Jupyter Notebook servers in a reservation that is large enough to accommodate all students at the same time. This reservation is present only during pre-specified course hours, hence it is important to select the right profile.

The Jupyter Notebook session

After launching a Jupyter Notebook server, you should see something similar to the following screen

Jupyterhub   Logout   Control Panel

Files   Running   Clusters

Select items to perform actions on them.   Upload   New ▾   ⟳

☐ 0 ▾ ▮ /   Name ↓   Last Modified   File size
☐ ▢ Example_folder   een paar seconden geleden
☐ ▤ Course_01.ipynb   3 minuten geleden   72 B

where your teacher might have already prepared some material for you to work with (in this example 'Course_01.ipynb' and the 'Example_folder').

This view shows the files and folders present in your home directory.

Basic navigation

You can browse through the folders or open files by clicking on them. In the example below, we clicked the folder 'Example_folder' and see that it is emtpy. To go back up to a higher level folder, click the '..' after the first folder in the list.

Jupyterhub   Logout   Control Panel

Files   Running   Clusters

Select items to perform actions on them.   Upload   New ▾   ⟳

☐ 0 ▾ ▮ / Example_folder   Name ↓   Last Modified   File size
   ▢ ..   een paar seconden geleden
   The notebook list is empty.

Create/move/remove folders

To create a new folder inside the 'Example_folder', click the 'New' button in the top right corner. By default, this will create an Untitled folder

Jupyterhub   Logout   Control Panel

Files   Running   Clusters

Select items to perform actions on them.   Upload   New ▾   ⟳

☐ 0 ▾ ▮ / Example_folder   Name ↓   Last Modified   File size
   ▢ ..   een paar seconden geleden
☐ ▢ Untitled Folder   een paar seconden geleden

You can change the name by selecting the checkbox in front of the folder and click 'rename'
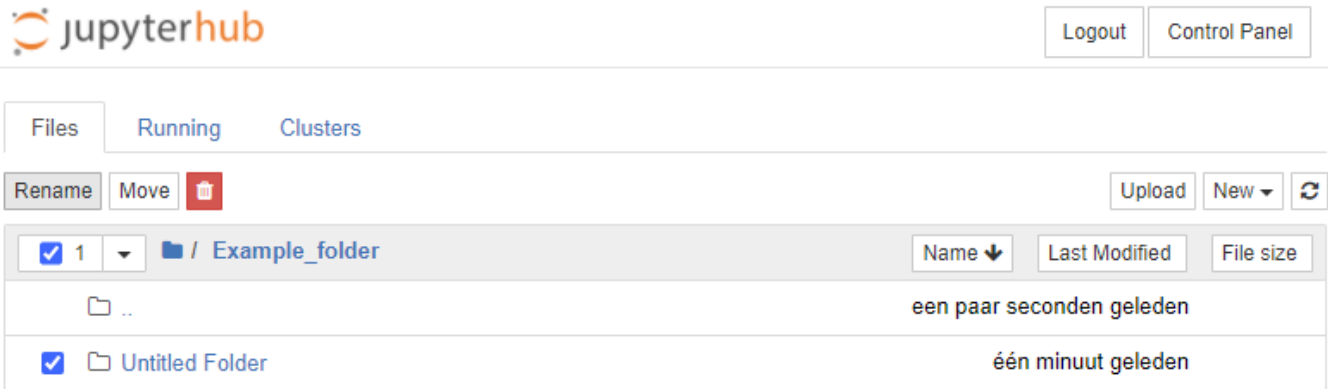
In the same why, by selecting the checkbox in front of the folder, you can move it (by clicking the 'Move' button), or remove it (by clicking the trash bin).

Create/move/remove files

There are a few ways to create new files.

- Click 'New' in the top right and start a notebook (in the example below, a Python 3 or R notebook). This will start a notebook, which will automatically create an 'Untitled notebook' file that you can rename later (in the same way as you rename a folder).
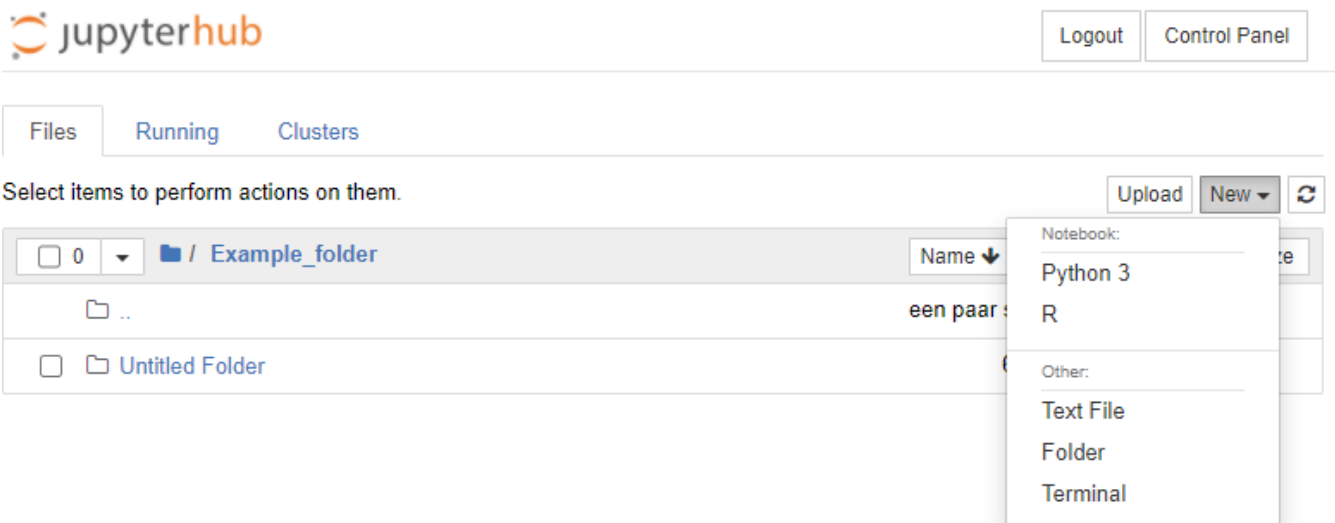
- Click 'New' in the top right, and start a Text file. This will automatically create an 'Untitled' text file, that again you can rename (in the same way as you rename a folder).
- Upload a file (or multiple files) by clicking the 'Upload' button in the top right.

Download files

To download a file, select it, and press the download button:

Unfortunately, it is not possible to select multiple files and download them all at once. This is a general limiation of Jupyter Notebook servers.

Starting a notebook

As said, one of the ways to create a new file is by starting a notebook through the 'New' menu on the top right. In the 'New' menu, all Notebooks that can be started are show under the 'Notebook' header. In this example, you can see that the currently running Jupyter Notebook server supports Python 3 and R notebooks. Note that you may see other Notebooks apart from these two: in that case SURF or your teacher has installed additional Notebooks that can be started.

When you start a new Notebook, a new tab opens in your browser, that shows the running Notebook. For example, in an empty notebook, you would see:
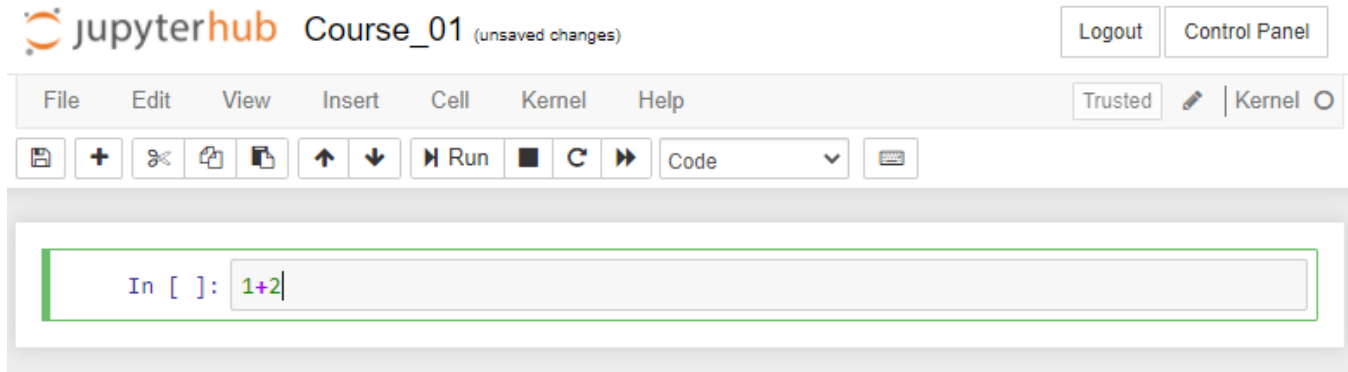

Working in a notebook

Running code

A Jupyter Notebook is essentially en environment in which you can combine text, code, and output. For this section, we will assume you are running a Python Notebook, so we will write Python syntax. As a simple example, we can write code that adds two numbers:


There are multiple ways to execute this code. The first option is to go simply select the cell you want to run, and press 'Run'. Another option is to go to the 'Cell' menu, and click on of the 'Run' options. If you hover over these menu items, a tooltip will explain exactly what each item does.
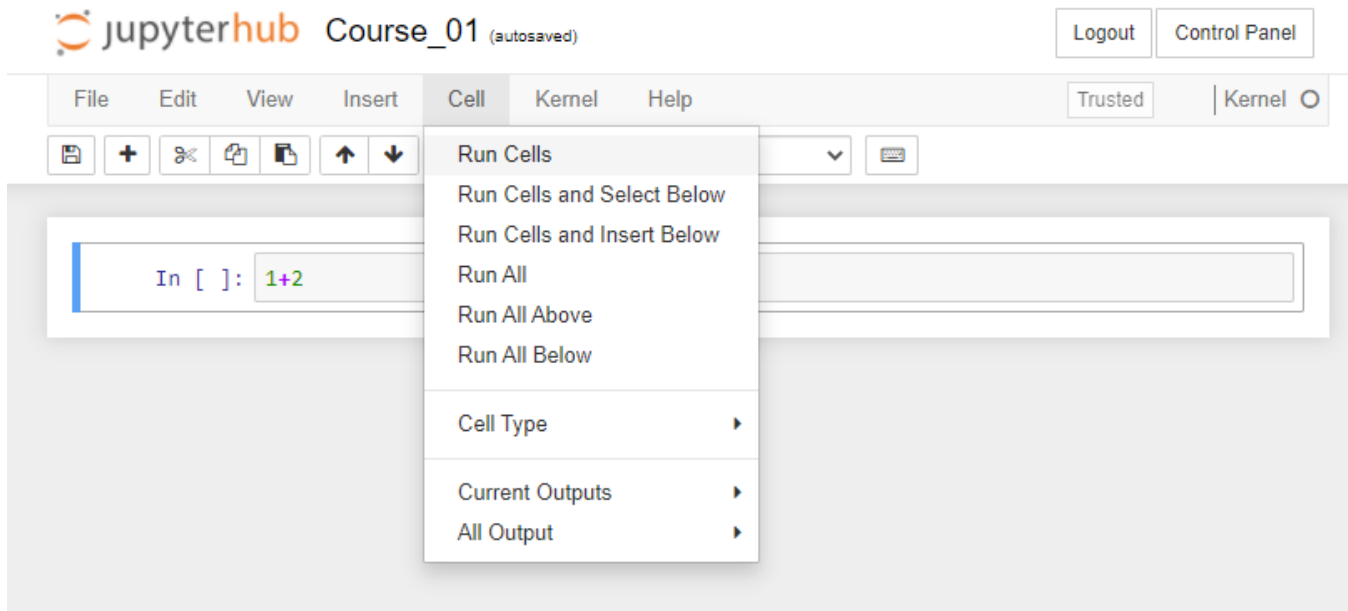
Finally, you can run cells using shortcuts. For example, to run the current cell, press shift + enter. Note that there are many more shortcuts; you can click the keyboard icon to see a full list.

After running the cell, we also see the output
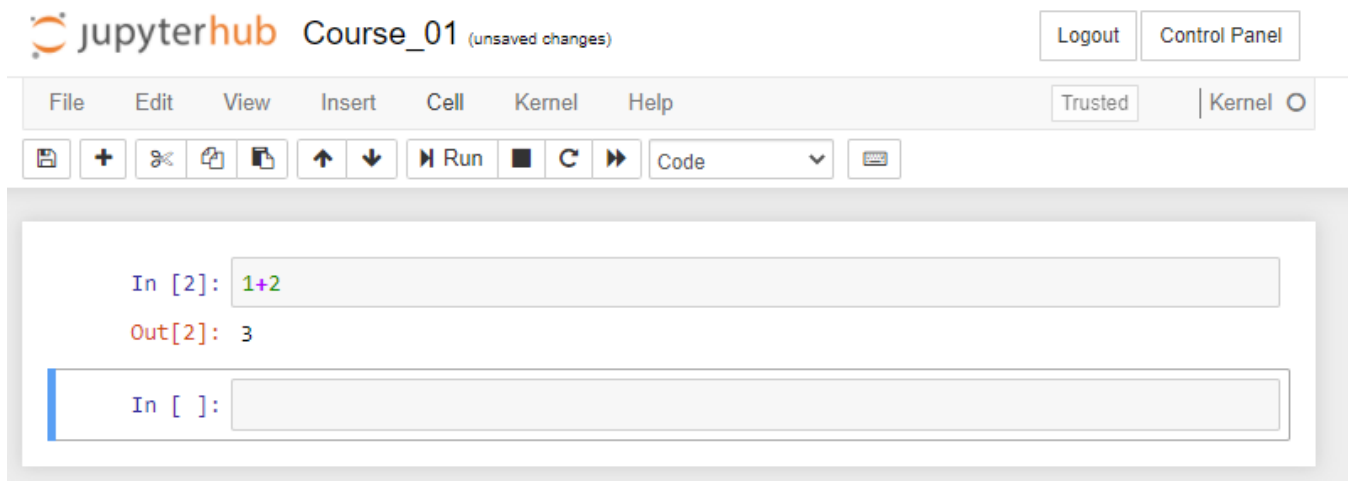
A new code field has automatically appeared in this case. You can also add new code fields by pressing the '+' button, or cut, copy and paste code fields with the corresponding buttons. With the arrow buttons, you can move the current code cell up or down.

Interrupting a calculation

You may want to interrupt a calculation, e.g. because it is taking very long and you found out you made a mistake in your code. You can either press the 'stop' button, or go to the 'Kernel' menu and press 'Interrupt'.
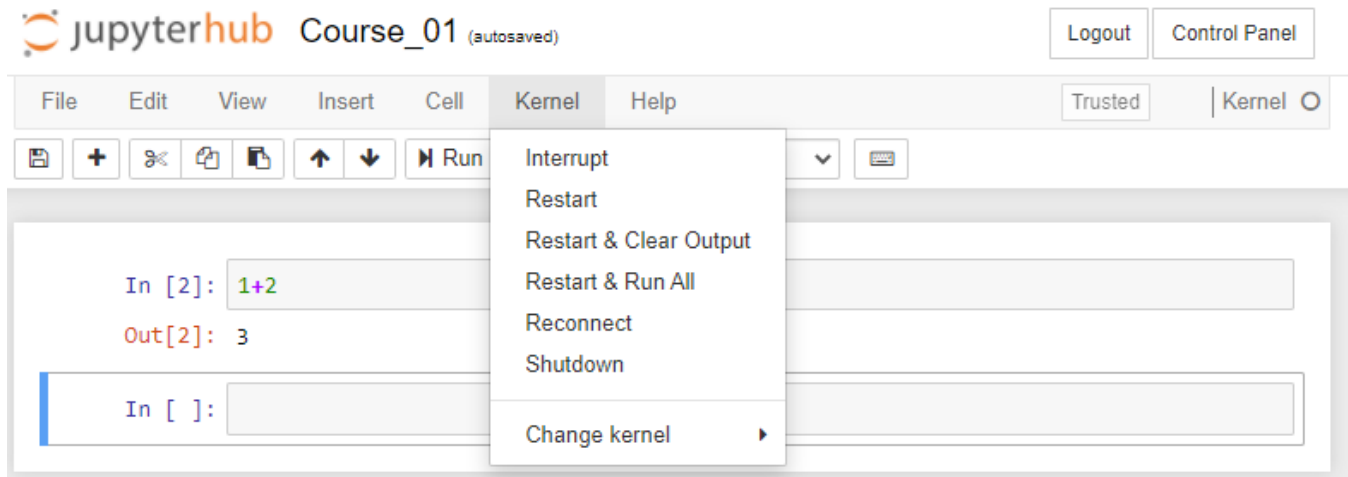

Restarting the kernel

Sometimes, you may also want to restart the 'Kernel'. The Kernel keeps all your variables in memory. While you can always override existing variables that you have assigned, maybe you want to be sure to get a 'clean' start (for example to test if your complete Notebook runs without errors). In that case, you can restart the kernel with the circular arrow button, or by going to the 'Kernel' menu and pressing 'Restart'.

Writing text

You can convert the current cell to a text cell by going to the dropdown menu that says 'code' and change it to 'Markdown'.
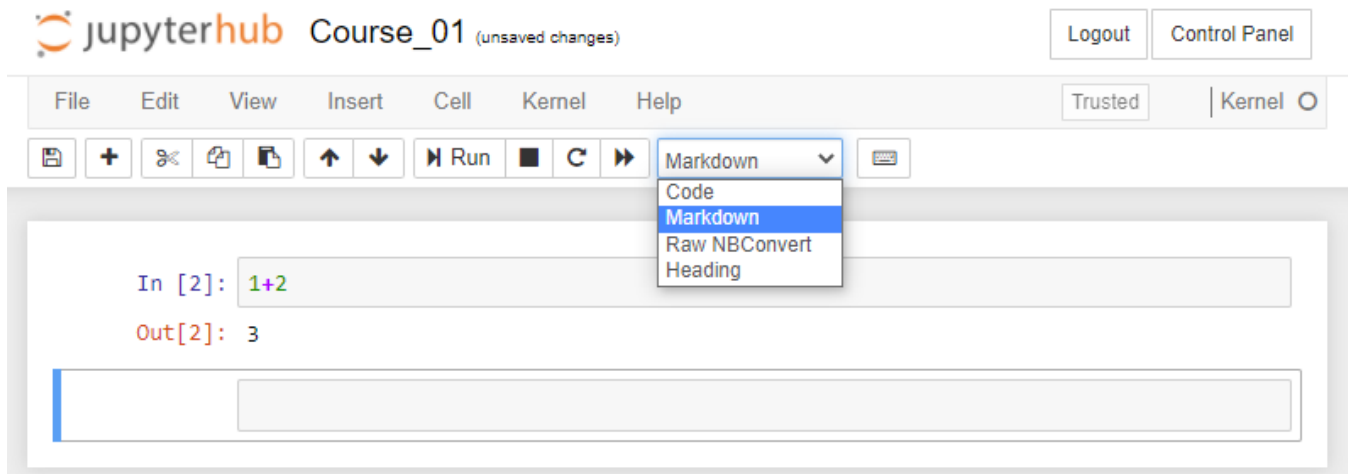
Now you can type text in a markup language called 'Markdown'. For example, to create a header:

Now, when we execute this cell (just like we would execute code), the text will be formatted:

For more information on how to write formatted text in Markdown, search the web for a Markdown tutorial.

Saving your notebook

While Jupyter Notebook will autosave your notebook at regular intervals, it is good practice to save your notebook regularly yourself. You can save it under the current name with the floppy disk icon on the left. If you want to save your notebook under a different name, you can go to the 'File' menu and click 'Save as'.

Closing your notebook

Go to 'File' and click 'Close and Halt'. This will stop the notebook and close the current browser tab. After shutting down, all objects in memory will be deleted, so the next time you start your notebook, you would have to re-execute the cells (though of course any printed output will still be there, even without re-executing).

Note that if you just close your tab without shutting down the notebook, the notebook will keep running. This is indicated by the green icon and the 'Running' word in the browser view.

It's not a big issue if a notebook is still running, it means you can continue with it where you left off (though all notebooks will be shut down once the Jupyter Notebook server shuts down). It does however mean that your notebook will still consume memory. If you have many (large) notebooks simultaneously in a running state, you may run out of memory. To avoid this, either open it again, and go through the 'File' menu to 'Close and Halt' your notebook. Or, from the browser view, you can select the checkbox in front of the notebook, and press 'Shutdown'.

Alternatively, go to the 'Running' tab for an overview of all your running notebooks, and shut it down there by pressing the 'Shutdown' button:

Shutting down your notebook server

Your Jupyter Notebook server will remain running, even if you close your browser tab, or log out from the JupyterHub. This allows you to reconnect to a running notebook when e.g. your internet connection is shortly interrupted. For the **homework profile**, an **inactivity timeout** is active that will make sure that a Notebook server remains idle for a while (10-20 minutes or so) will shutdown automatically. This timeout is not in place for the **course profile**; here your notebook will be automatically shutdown at the end of the course hour reservation.

You can also shutdown your server manually. This opens up a slot for other notebooks immediately, which will be appreciated by your fellow students when all slots in the **homework profile** have been filled up. To shutdown your notebook, click the "Control Panel" button in the top right, and then click the "Stop My Server" button:

Stop My Server **My Server**

Note that it may take around 10 seconds for the server to be stopped. If you don't see changes, try refreshing the page.

Logging out from the JupyterHub environment

Logout

You can log out from the JupyterHub environment, by using the Logout   button in the top-right corner.

Advanced topics

Downloading/uploading large numbers of files

The quickest way to upload or download a large number of files is by connecting to Lisa through an FTP client. This is explained in the Lisa documentation:
https://userinfo.surfsara.nl/systems/lisa/user-guide/connecting-and-transferring-data#sftp