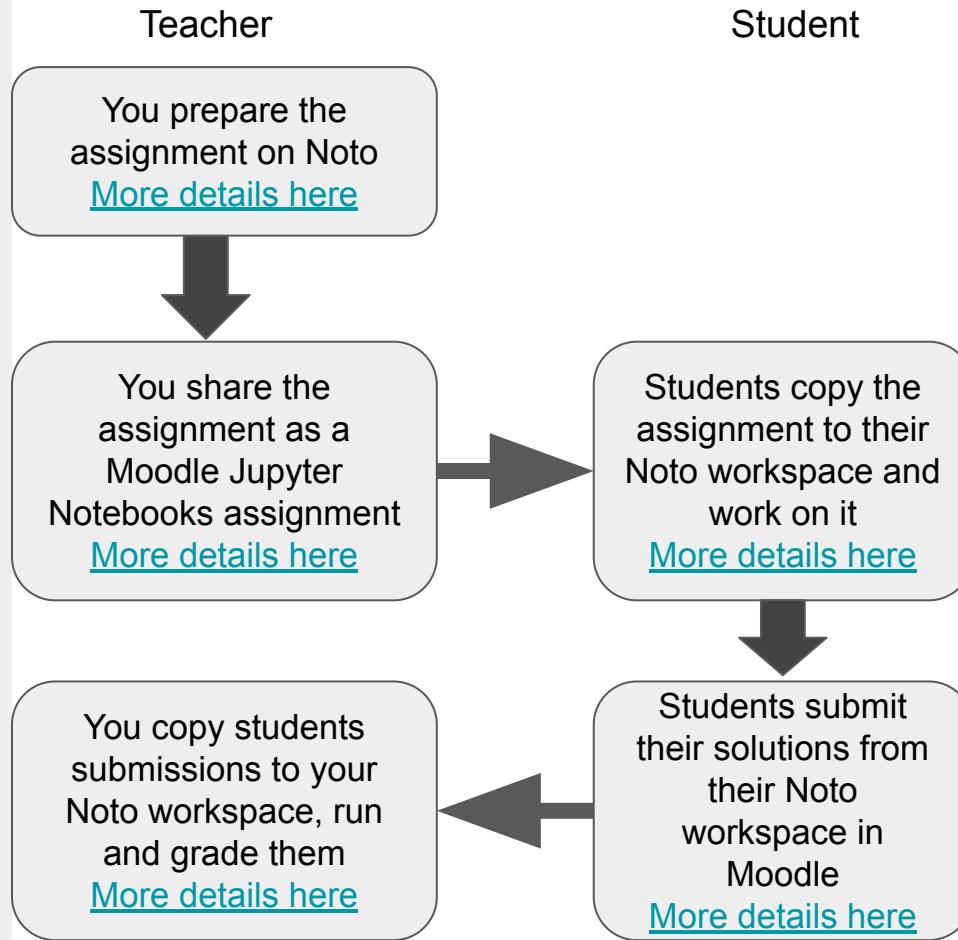


Sharing Notebook Assignments through Moodle

If you would like your students to do **assignments in Python, R, C or Octave**, you can assign them files from your Noto workspace through Moodle, which they can copy to their Noto workspace, write and execute their code online and submit via Moodle.

Note: it is best if you and your students use a computer or a laptop (**not** a tablet or a smartphone).



You prepare your files on Noto

Note: This step is necessary only if you want to **provide students with a notebook to complete or to modify**.

Jump to the next step, option 2, if want to create an empty notebook assignment.

Teacher

Student

You prepare the assignment on Noto
[More details here](#)

You share the assignment as a Moodle Jupyter Notebooks assignment
[More details here](#)

Students copy the assignment to their Noto workspace and work on it
[More details here](#)

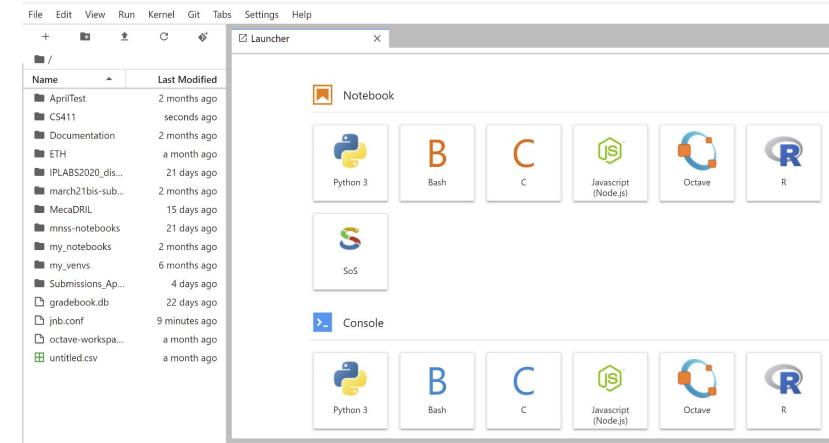
You copy students submissions to your Noto workspace, run and grade them
[More details here](#)

Students submit their solutions from their Noto workspace in Moodle
[More details here](#)

You prepare the assignment on Noto

1. Go to <https://noto.epfl.ch> on your web browser
2. Connect with your GASPAR login and arrive on your personal online workspace (image top right).
3. Create the assignment notebook with the instructions and the code snippets.

We advise you to include a description of the **criteria used for evaluation** as well as **what success means** for each, in addition to the points for each question (image bottom right). For further guidelines on how to create good exercise and lab assignment notebooks along with examples, see [our website](#).



Task 5 : Plot the means for the EPFL_CourseGrade given the prior grade level. (2 points)

```
[ ]: #####  
# Begin Solution  
  
# end Solution  
#####
```

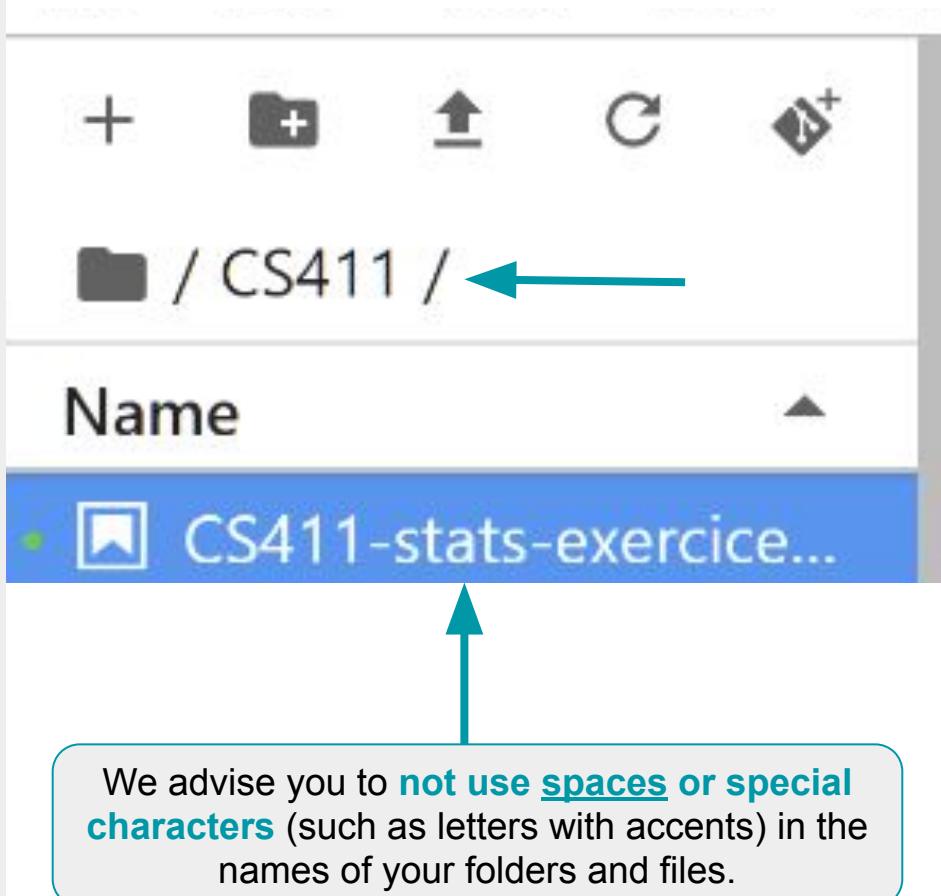
Task 6 : Compare the means of EPFL_CourseGrade. (5 points)

- Check assumptions to run an ANOVA
- Run an ANOVA or a replacement if the assumptions are not set

```
[ ]: #####  
# Begin Solution  
  
# end Solution  
#####
```

Organising notebooks

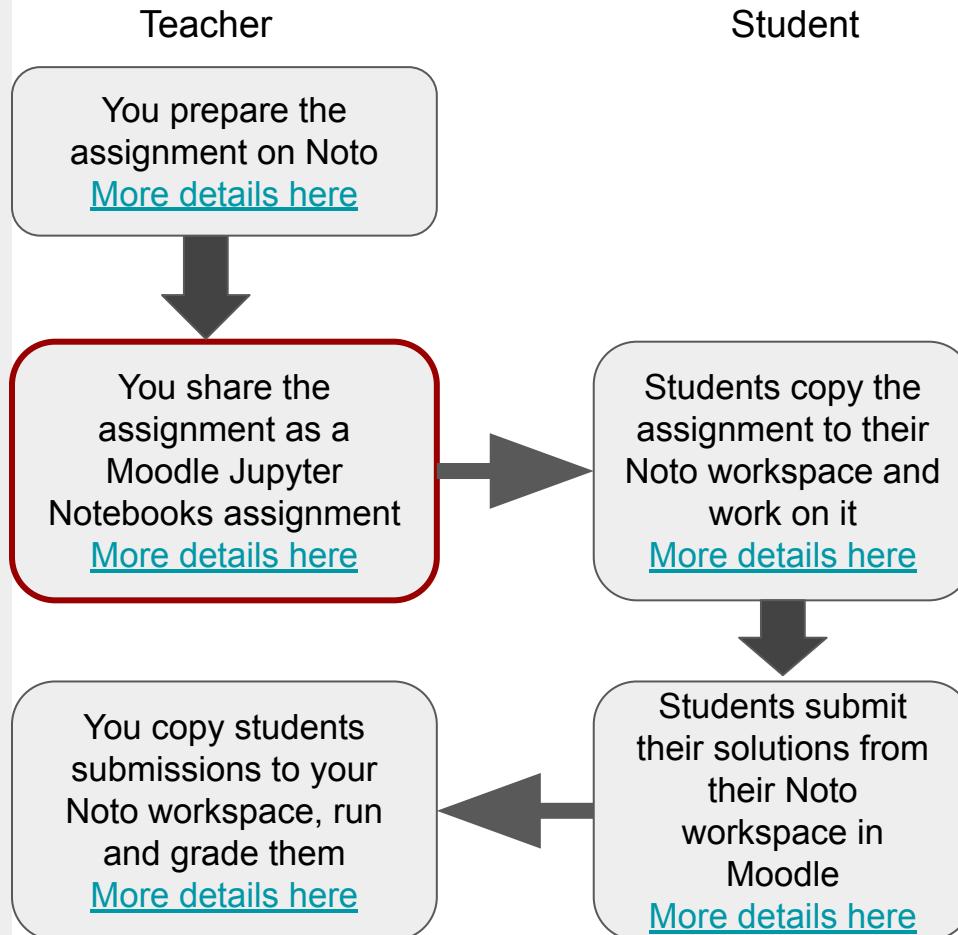
1. Notebooks can be **renamed** and **organized** into folders just as you would do on a computer.
2. The left pane of the window lets you create new folders and move files by drag and drop, by using the toolbar or by right-clicking on elements.
3. You can create a folder for your course (eg. called “CS411”), a notebook associated with a lab or assignment (“CS411-stats-exercices.ipynb” in the image shown on the right) and share this with the students through Moodle. You can also include associated files, such as data, in the same folder.



You create the assignment in Moodle

You have two options:

- **Option 1:** provide students with a **pre-existing notebook** (as well as other files such as datasets etc. if necessary) that students will complete and submit back to you.
Caution: *limit the size of the assignment files as these will be submitted back by all your students.*
- **Option 2:** provide only instructions, students will create a notebook by themselves and submit it to you



Opt. 1: Share a notebook as an assignment in Moodle

1. Add an assignment to your course by clicking on “**Add an activity or resource**” then selecting “**Assignment**”
2. Select the **Submission type** as “**Jupyter Notebooks**”. *Note: deselect other types of submissions unless you need them.*
3. Provide a meaningful name to the assignment.
4. In the directory tree of your Noto workspace, select the *folder* you want to share with students.
5. In the **Feedback types**, select “**Feedback comments**”, “**Jupyter Notebooks**” and “**Offline grading worksheet**”. *Note: deselect other types of feedback unless you need them.*
6. Upon saving, the assignment appears in on the Moodle page of your course.

Statistical Analysis 

1 → + Add an activity or resource

Submission types

2 Jupyter notebooks File submissions Online text

3 Assignment name: Anova
Source folder: /Assignments/Anova

This will be the name given to the assignment folder in the students' workspace.

4 This is your Jupyter workspace. Please select the folder containing your assignment.
jnb.conf Documentation my_venvs my_notebooks Assignments Anova

Feedback types

5 Feedback comments Annotate PDF Jupyter notebooks Feedback files

Comment inline: No

Statistical Analysis

6 Analysis of variance



Opt. 2: Create an empty notebook assignment

1. Add an assignment to your course using “**Add an activity or resource**” then selecting “**Assignment**”
2. Provide instructions as you normally do for any Moodle assignment (either in the “Description” textbox or as an attached file).
3. Choose the **Submission type** as “**Jupyter Notebooks**”. *Note: deselect other types of submissions unless you need them.*
4. **Do not select any folder** from the Noto directory tree so that the “Source Folder” textbox remains empty.
5. In the **Feedback types**, select “**Feedback comments**”, “**Jupyter Notebooks**” and “**Offline grading worksheet**”. *Note: deselect other types of feedback unless you need them.*
6. Upon saving, the assignment appears in on the Moodle page of your course.

The screenshot shows the Moodle 'Add an activity or resource' page for creating a new assignment. Step 1 is indicated by a teal arrow pointing to the 'Add an activity or resource' button. Step 2 is indicated by a teal circle around the 'Assignment' option under 'Activity type'. Step 3 highlights the 'Submission types' section where 'Jupyter notebooks' is checked. Step 4 highlights the 'Source folder' section which is empty. Step 5 highlights the 'Feedback types' section where 'Feedback comments', 'Jupyter notebooks', and 'Offline grading worksheet' are checked. Step 6 highlights the 'Statistical Analysis' section where 'Analyse MOOC data' is listed.

1 → + Add an activity or resource

Statistical Analysis

Submission types

Assignment name

Source folder

This is your Jupyter workspace. Please select the folder containing your assignment.

Feedback types

Comment inline

Statistical Analysis

Analyse MOOC data

Students get the assignment

If you have provided a notebook in the assignment (option 1 in the previous step), students can get a copy of the files you have provided into their Noto workspace using the instructions in this section.

Otherwise, if you created an empty assignment (option 2 in the previous step), students simply skip this step.

Teacher

Student

You prepare the assignment on Noto
[More details here](#)

You share the assignment as a Moodle Jupyter Notebooks assignment
[More details here](#)

You copy students submissions to your Noto workspace, run and grade them
[More details here](#)

Students copy the assignment to their Noto workspace and work on it
[More details here](#)

Students submit their solutions from their Noto workspace in Moodle
[More details here](#)

Students copy the assignment to their Noto Workspace

1. When students click on the name of the assignment in Moodle they will see an option “**Get a copy of the assignment**”.
2. When they click on this link they will be shown the directory tree of their Noto workspace. They click on the folder where they want to **save the assignment** and click on “Copy assignment”.

Submission status

Submission status	No attempt
Grading status	Not graded
Due date	Tuesday, 8 June 2021, 12:00 AM
Time remaining	6 days 8 hours
Last modified	-

Jupyter notebooks [Get a copy of the assignment](#)



1

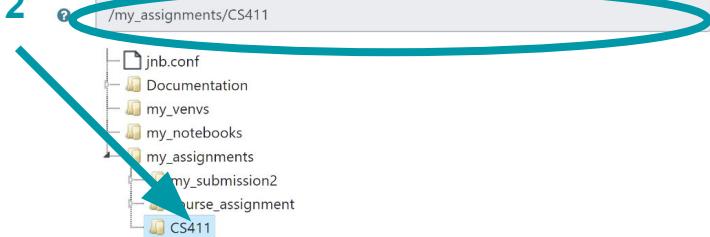
Submission comments [Comments \(0\)](#)

Destination folder



Below is a view of your Jupyter workspace. Please select the folder where to copy the assignment. Feel free to create a folder in Jupyter before copying the assignment.

2



[Refresh tree](#) [Copy assignment](#) [Cancel](#)

Students work on the assignment in their Noto workspace

3. The assignment will be copied to their Noto workspace and appear there.
4. The students work on the notebook in Noto as per the instructions provided within the notebook (or within the assignment information) and add/modify code as required.

If needed, students can download another copy of the assignment into their Noto workspace, using the same procedure again.

A screenshot of a Jupyter Notebook interface. At the top, a message says: "A copy of the assignment has been copied to '/my_assignments/CS411/course_assignment'. Click here to get to your Jupyter workspace. You can create another copy of the assignment or click 'Cancel'." A blue arrow labeled '3' points to the 'Click here' link. Below this, a 'Back to assignment' button is visible. The main area shows a file list with one item: "course_assignment" last modified "5 minutes ago". A blue arrow labeled '4' points to the 'course_assignment' entry. The bottom part of the interface shows a notebook titled "CS411-stats-exercises.ipynb" with a section titled "How to use this notebook?" containing instructions about executing code cells and hiding cells for readability. A blue rounded rectangle highlights this section.

A copy of the assignment has been copied to "/my_assignments/CS411/course_assignment".
Click here to get to your Jupyter workspace.
You can create another copy of the assignment or click "Cancel".

Back to assignment

L
/ my_assignments / CS411 /

Name	Last Modified
course_assignment	5 minutes ago

Launcher CS411-stats-exercises.ipynb git

How to use this notebook?

- This notebook is made of text cells and code cells. The code cells have to be **executed** to see the result of the program. To execute a cell, simply select it and click on the "play" button (▶) in the tool bar just above the notebook, or type `shift + enter`. It is important to execute the code cells in their order of appearance in the notebook.
- To improve readability, it can be useful to **hide** cells from the notebook (e.g. long code cells). To hide a cell, select it and click on the blue bar which appears on its left. To make the cell visible again, just click again on the blue bar, or on the three "dots" which represent the collapsed cell.

The MOOC dataset

The data we use in this document to demonstrate the use of basic statistics is about students' performance in academic exams (e.g. the algebra course taken at the university) and their activity online in a related Massive Open Online Course (e.g. the algebra MOOC). The general question we try to answer is: what is the relation between the use of the MOOC by students and their academic achievement.

Question: Does the use of MOOCs help succeed in courses ? Do only good students use the MOOCs ? Are MOOCs more helpful for better students ?

As a general remark, we should note that because we did not conduct a controlled experiment with random assignment of subjects to experimental groups, we cannot establish any causal relationships between MOOC use and academic performance. Rather, we use statistical tools to "explore" data.

Students submit their work

Teacher

Student

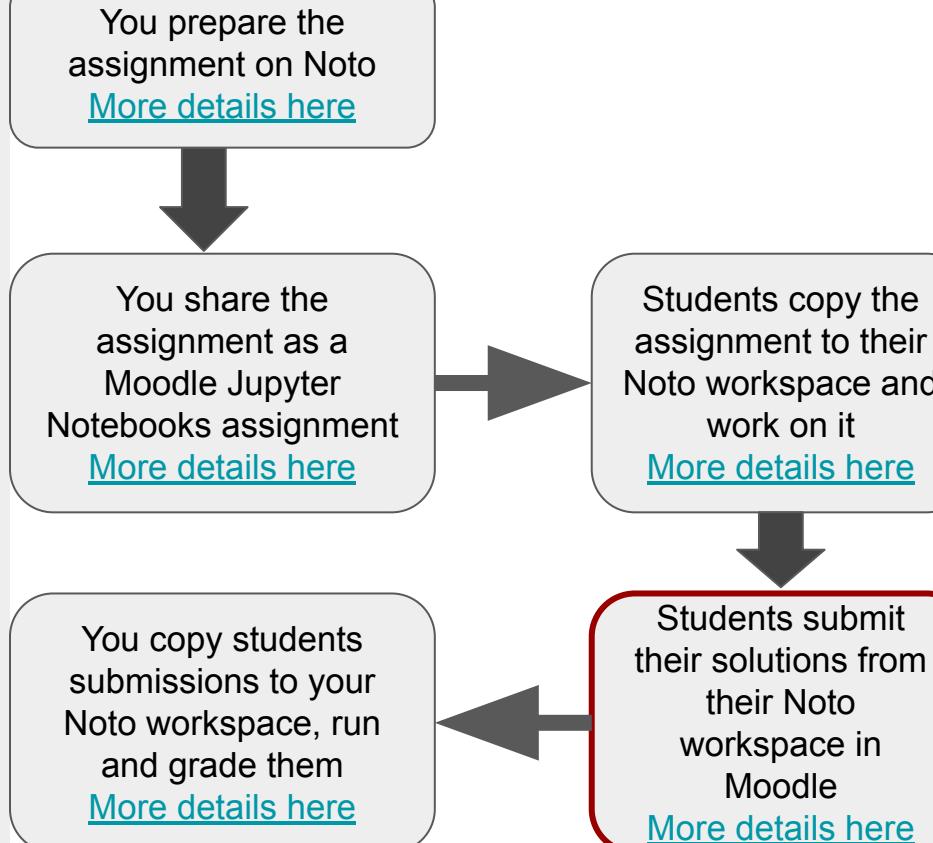
You prepare the assignment on Noto
[More details here](#)

You share the assignment as a Moodle Jupyter Notebooks assignment
[More details here](#)

You copy students submissions to your Noto workspace, run and grade them
[More details here](#)

Students copy the assignment to their Noto workspace and work on it
[More details here](#)

Students submit their solutions from their Noto workspace in Moodle
[More details here](#)



Students submit the solutions from their Noto workspace in Moodle

1. Students click on the name of the assignment in Moodle then on “**Add submission**”.
2. They are shown the directory tree of their Noto workspace and they select the *folder* they want to submit.

Submission status	
Submission status	No attempt
Grading status	Not graded
Due date	Tuesday, 8 June 2021, 12:00 AM
Time remaining	6 days 7 hours
Last modified	-
Jupyter notebooks	Get a copy of the assignment
Submission comments	Comments (0)

The screenshot shows the Moodle submission interface for an assignment named "course_assignment". A teal circle labeled "1" highlights the "Add submission" button. Another teal circle labeled "2" highlights the file selection tree. The tree shows the following directory structure:

- /my_assignments/CS411/course_assignment
 - jnb.conf
 - Documentation
 - my_venvs
 - my_notebooks
 - my_assignments
 - my_submission2
 - course_assignment
 - CS411
 - course_assignment

At the bottom, there is a green "Refresh tree" button.

Students submit the solutions from their Noto workspace in Moodle

3. Students click on “Save Changes” and their assignment status changes to “Submitted for grading”.

A copy of the submitted files is saved into moodle as a reference.

If students modify their files on noto, they have to upload again a new version of their submission into moodle for the changes to be seen by the teacher.

4. Students can view a copy of their submission if they wish (this will create a new copy of their submission back into Noto).

Submission status

Submission status	Submitted for grading
Grading status	Not graded
Due date	Tuesday, 8 June 2021, 12:00 AM
Time remaining	6 days 7 hours
Last modified	Tuesday, 1 June 2021, 4:40 PM
Jupyter notebooks	Get Jupyter notebooks View your submission
Submission comments	Comments (0)

You get students' submissions and grade them

In this step you can:

- Get the submission of a single student
- Get the submissions of all students at the same time (bulk action)

You can also:

- Enter your grades and comments manually in Moodle
- Enter your grades and comments in Noto while you review students' notebooks and upload the resulting gradebook in Moodle (bulk action)

Teacher

Student

You prepare the assignment on Noto
[More details here](#)

You share the assignment as a Moodle Jupyter Notebooks assignment
[More details here](#)

Students copy the assignment to their Noto workspace and work on it
[More details here](#)

You copy students submissions to your Noto workspace, run and grade them
[More details here](#)

Students submit their solutions from their Noto workspace in Moodle
[More details here](#)

You copy the assignments from Moodle to your Noto workspace (single student)

1. When you click on the assignment name in Moodle, you should be able to see the number of submissions made. Click on the “View all submissions” to view and grade the submissions.
2. A list of students in the class is displayed with the link to view the notebooks of those who submitted. Click the link “View submission” to download the submission of the students you wish.
3. You will see your Noto directory tree. Specify the folder in which to copy the submission into and click the “Copy submission” button.

The screenshot shows the Moodle assignment page for a single student. At the top, it displays the assignment details: "Hidden from students: No", "Participants: 2", "Submitted: 1", "Needs grading: 1", and "Due date: Tuesday, 8 June 2021, 12:00 AM". Below this, the "Time remaining" is shown as "6 days 6 hours". Two numbered circles highlight specific actions: "1" points to the "View all submissions" button, which is highlighted with a teal circle; "2" points to the "View submission" link for "Test 3 User" (test3@epfl.ch), which is also highlighted with a teal circle. The student list shows "Test 2 User" (test2@epfl.ch) with a "Submitted for grading" status and "Grade" and "Edit" buttons, and "Test 3 User" (test3@epfl.ch) with a "No submission" status and "Grade" and "Edit" buttons. At the bottom, a modal dialog titled "Analyse MOOC data" shows a file tree under "Destination folder" with "moodle" and "jupyter" icons. It lists files like "jnb.conf", "my_venvs", "my_notebooks", "Assignments", "Documentation", "bulkdownload", "bulkdownloadcancel", "bulkdownloadcancel2", "bulkdownload3", "test-student-view", "December", "Untitled.ipynb", "Test_Assignment", and "grade_book.csv". A teal arrow points from the "Test_Assignment" folder in the tree to the "Copy submission" button at the bottom right of the dialog, which is also highlighted with a teal circle. The "EPFL" logo is in the bottom right corner.

You copy the assignments from Moodle to your Noto workspace (multiple students together)

1. When you click on the assignment name in Moodle, you should be able to see the number of submissions made. Click on the “**View all submissions**” to view and grade the submissions.
2. A list of students in the class is displayed with the link to view the notebooks of those who submitted. Check the name of the students whose submission you want to download. Go to the dropdown menu titled “*With Selected...*”, select the option “**Upload submissions to Jupyter**” and Click on “**Go**”.

The screenshot shows a Moodle assignment page titled "Analyse MOOC data". The assignment details are as follows:

- Hidden from students: No
- Participants: 2
- Submitted: 1 (circled in red)
- Needs grading: 1
- Due date: Tuesday, 8 June 2021, 12:00 AM
- Time remaining: 6 days 6 hours

A large red circle highlights the "View all submissions" button, which is circled again in red with the number "1".

Below the assignment details, a table lists student submissions:

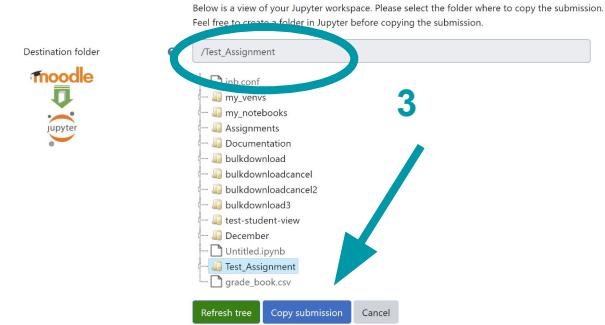
Select	User picture	First name / Surname	Email address	Status	Grade	Edit	Last modified (submission)	Jupyter notebooks	File submissions	Submission comments	Last mod (gr)
<input checked="" type="checkbox"/>		Test 2 User	test2@epfl.ch	Submitted for grading Graded	Grade 100.00 / 100.00	Edit	Monday, 13 December 2021, 12:29 PM	View submission		Comments (0)	Mo 13 Dec 2021, 12:29 PM
<input checked="" type="checkbox"/>		Test 3 User	test3@epfl.ch	Submitted for grading Graded	Grade 90.00 / 100.00	Edit	Monday, 13 December 2021, 12:28 PM	View submission		Comments (0)	Mo 13 Dec 2021, 12:28 PM

A red circle highlights the "With selected..." dropdown menu, which is circled again in red with the number "2". The menu options are:

- Lock submissions
- Unlock submissions
- Download submissions
- Grant extension
- Upload submissions to Jupyter** (highlighted in blue)
- Unlink submissions

You copy the assignments from Moodle to your Noto workspace (multiple students together)

3. You will see your Noto directory tree. Specify the folder in which to copy the submissions into and click the “**Copy submission**” button.



You open student's submissions in your Noto workspace and evaluate them

1. The submissions (single or multiple) are copied to your Noto workspace and will appear there.

Since you selected the option “*Offline grading worksheet*” while creating the assignment, a **gradebook folder** is created along with each submission which contains a csv file, which you can use for entering grades and feedback in Noto as described in the next slides.

2. Open the notebook inside the submission folder. Evaluate the students solutions for the assigned tasks by running the relevant cells.

A copy of the student submission has been copied to "/Assignments/Anova/anova_student5".
[Click here to get to your Jupyter workspace.](#)

[Back to assignment](#)

■ / Test_Assignment / descriptive-statistics_student5 /

Name

Last Modified

■ Data

an hour ago

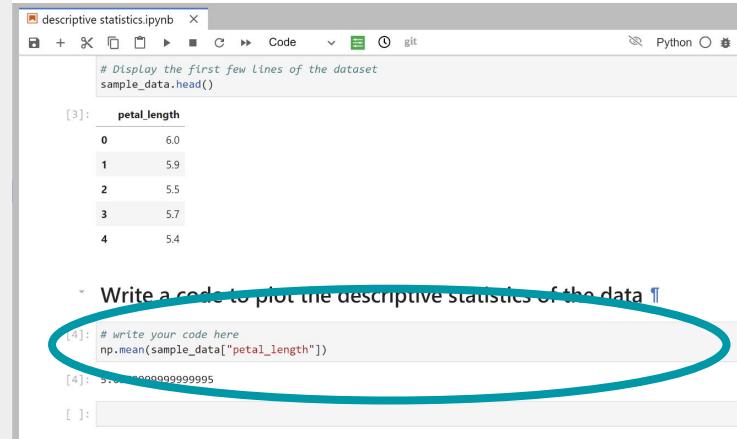
■ gradebook

an hour ago

■ descriptive statistics.ipynb

an hour ago

1



```
# Display the first few Lines of the dataset
sample_data.head()

[3]: petal_length
0      6.0
1      5.9
2      5.5
3      5.7
4      5.4
```

* Write a code to plot the descriptive statistics of the data

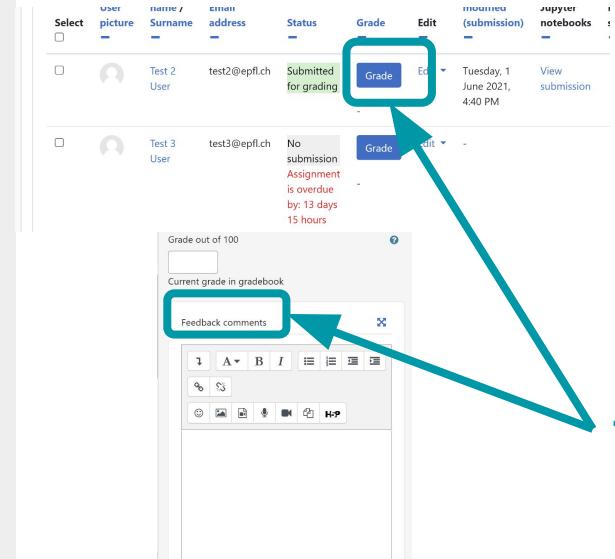
```
[4]: # write your code here
np.mean(sample_data["petal_length"])

[4]: 5.0000000000000005
```

2

You enter the grades for students assignments in Moodle

1. You can enter grades for students' submissions in Moodle. It is good practice to also provide detailed feedback to students about their work: you can do this by leaving comments in the “Feedback comments” field when clicking on the **“Grade”** button in the submission list.
2. An alternative is to **record your grades and comments** directly on Noto in the **offline gradebook** provided with each student's submission: edit the content of the CSV file for each student, using the “Feedback comments” column to enter feedback. You can then directly upload this information on Moodle (see next slides)



The screenshot shows a Jupyter Notebook cell with two tabs: 'descriptive statistics.ipynb' and 'descriptive-statistics_user5_g'. The cell displays a CSV table with columns: Grade, Maximum Grade, Grade can be cha..., Last modified (su..., Last modified (gra..., and Feedback comments. The last row shows values: 1, 60, 100, Yes, 13/12/2021 12:..., -, and 'Think about the implementation'. A red box highlights the 'Feedback comments' column across all rows.

	Grade	Maximum Grade	Grade can be cha...	Last modified (su...	Last modified (gra...	Feedback comments
1	60	100	Yes	13/12/2021 12:...	-	
+						Think about the implementation

2

You enter the grades for students assignments in Moodle

- Once you have edited the gradebook CSV files of all the students, you can **create a compound file containing the grades of all the students** using the *bash* command on the right: open a Terminal on Noto and place yourself in the submissions folder, then run the command. This will create a file called *grade_book.csv*.

Check it carefully, then download it to your computer.

- On Moodle, click the name of the assignment and then click on “*View All submissions*”. Then from the dropdown menu at the top select “***Upload grading worksheet***”.

3: (one single line)

```
IFS=$'\n'; for csv in $(find -type f -name '*_grading\.csv' | sort); do cat ${csv}; done | sort -u | grep -v '^,,,,' > grade_book.csv
```

4

Descriptive Statistics											
Grading action	<input type="button" value="Choose..."/> <input checked="" type="button" value="Choose..."/> <input type="button" value="Download all submissions"/> <input type="button" value="Upload grading worksheet"/>										
First name	<input type="text" value="Bonnicius grading worksheet"/> <input type="button" value="View gradebook"/>										
Surname	<input type="text" value="Ah"/> <input type="button" value="View gradebook"/>										
Select	User picture	First name / Surname	Email address	Status	Grade	Edit	Last modified (submission)	Jupyter notebooks	File submissions	Submission comments	Last mo (gr)
<input checked="" type="checkbox"/>		Test 2 User	test2@epfl.ch	Submitted for grading Graded	<input type="button" value="Grade"/> 100.00 / 100.00	<input type="button" value="Edit"/>	Monday, 13 December 2021, 12:29 PM	<input type="button" value="View submission"/>	<input type="button" value="Comments (0)"/>	<input type="button" value="Mo 13 Dec 2021, 12:29 PM"/>	
<input checked="" type="checkbox"/>		Test 3 User	test3@epfl.ch	Submitted for grading Graded	<input type="button" value="Grade"/> 90.00 / 100.00	<input type="button" value="Edit"/>	Monday, 13 December 2021, 12:28 PM	<input type="button" value="View submission"/>	<input type="button" value="Comments (0)"/>	<input type="button" value="Mo 13 Dec 2021, 12:28 PM"/>	

You enter the grades for students assignments in Moodle

5. Upload the file.
6. Check the option to “Allow updating records that have been modified more recently in Moodle than in the spreadsheet.”
7. Click on the “Upload Grading worksheet” button and the grades and feedback comments are uploaded to each student. A list of changes will be displayed and you will be asked to confirm the changes.

The screenshot shows the 'Descriptive Statistics' page in Moodle. A file upload dialog is open, with the file 'grade_book.csv' selected. The file input field is highlighted with a red box and labeled '5'. Below the file input, there are fields for 'Encoding' (set to 'UTF-8') and 'Separator' (set to 'Comma'). A checkbox labeled 'Allow updating records that have been modified more recently in Moodle than in the spreadsheet.' is checked and highlighted with a red box, labeled '6'. At the bottom of the dialog is a blue 'Upload grading worksheet' button, which is also highlighted with a red box and labeled '7'. A message at the bottom of the dialog reads: 'There are required fields in this form marked *'.

Then in the list of submissions, you should see all the grades and feedback comments that you have just uploaded.

Getting help on noto

If you need support on noto:
noto-support@groupe.epfl.ch

- If you need **specific libraries**, please test if they are already installed on noto.
If not, please send us an email:
noto-support@groupe.epfl.ch
- If your class has **more than 50 students, please let us know** so that we can assist and monitor the load on the server.

More information on noto:
<http://go.epfl.ch/notebooks>