

# Discrete Mathematics

Number Theory

Mathematical Proofs

Topic 00 — Module Introduction

Lecture 31 — Guide to the Python Colab Practicals

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Recurrence Relations

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Set Theory

Autumn Semester, 2021

Graphs and

Relations

## Outline

- Locating and open python notebooks on colab
- Completing your work
- Downloading your work from colab and uploading to Moodle

# Course Locations

The image displays four screenshots of course management tools:

- Moodle:** A screenshot of the Moodle interface for the Discrete Mathematics module. It shows sections for Announcements, Upload Python/Colab Notebook Assignments, and P00 - Introduction to Python and Colab.
- GitHub:** A screenshot of the GitHub repository for Discrete Mathematics, showing sections like Module Introduction, Logic, Methods of Mathematical Proof, Sets, and Relations and Functions.
- Slack:** A screenshot of the Slack workspace for the module. It shows a message from Denis Flynn with a photo, and a message from kmurphy. The Slack sidebar shows various channels and users.
- Colab:** A screenshot of a Google Colab notebook titled "Practical 00 - Introduction to Python and Colab.ipynb". It includes a table of contents, a code cell with setup magic, and an introduction section.

**• Main entry point.**

**• Uploading of assignments.**

**• Online quizzes.**

**• All static content**

**• Links to python notebooks**

**• External resources**

**• Instant messaging (timetable changes etc)**

**• Public and one-to-one questions**

**• View, edit and run python notebooks.**

# Outline

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|--|----|
| <h2>1. Locating and Opening Notebooks</h2> <ul style="list-style-type: none"><li>• Notebooks are listed on the Moodle main page and within topics on the Github website.</li><li>• Clicking on Colab opens notebook in Colab.</li><li>• Need a separate Google account to use colab.</li><li>• Need to login and click on authorship warning before editing.</li></ul>   | 3  |
| <h2>2. Edit and Working with Notebooks</h2> <ul style="list-style-type: none"><li>• A notebook is a list of cells which are either:<br/>text — contain markdown text, where markdown is a simple but effective technique to typeset content<br/>code — which contain python code to run.</li><li>• The Colab interface has many features to help with editing notebooks, so it is worth spending some time just playing with it.</li></ul> | 7  |
| <h2>3. Downloading and Submitting Notebooks to Moodle</h2> <ul style="list-style-type: none"><li>• Colab automatically saves your notebook as you work, but you need to submit it to Moodle for grading.</li><li>• Download python ipynb using the Colab menu option</li><li>• Notebook should be saved to your Download folder.</li><li>• Open Moodle and upload file.</li></ul>  | 10 |

## Locating and Opening Notebooks

# Step 1 — Locating and Opening Notebooks

**Start from Moodle**

Select notebook from list

Click on link to external website

Open notebook using Colab

**Start from Github**

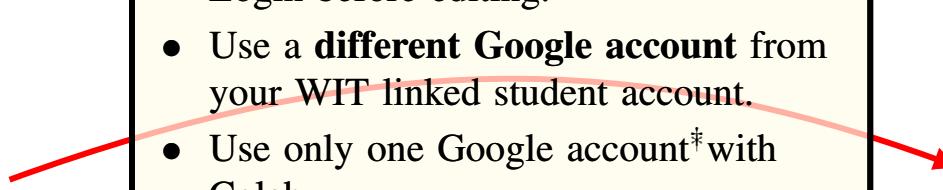
Navigate to required topic, then to required notebook

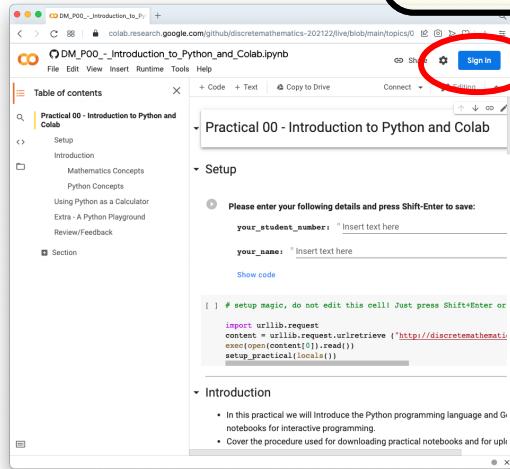
The diagram shows three main paths:

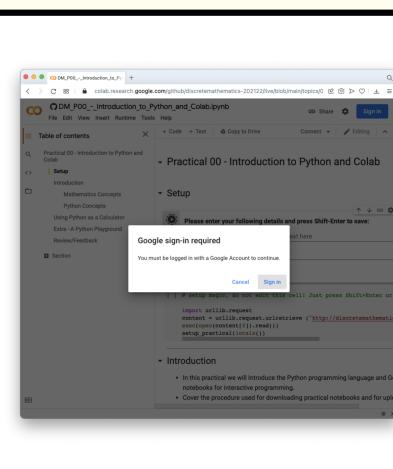
- Moodle Path:** Shows a Moodle course page for "Discrete Mathematics-17080-[2021-2022]". A red circle highlights the "POO - Introduction to Python and Colab" link under "Announcements". Another red circle highlights the "See external website for details." link on the assignment page.
- Colab Path:** Shows the assignment page with the "Open in Colab" button highlighted by a red circle. This leads to a Google Colab notebook titled "Practical 00 - Introduction to Python and Colab.ipynb" containing Python code and sections like "Setup" and "Introduction".
- Github Path:** Shows a "Module Introduction" page with several topics like "Logic", "Methods of Mathematical Proof", "Sets", and "Relations and Functions". A red arrow points from the "Navigation" step to this page, indicating where to find the required topic.

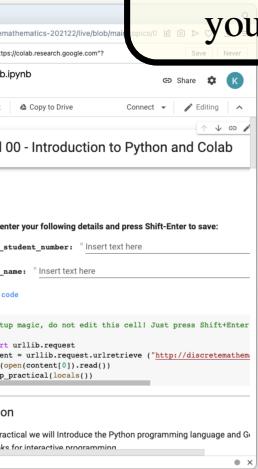
## Step 2 — Login Before You Start Editing ...

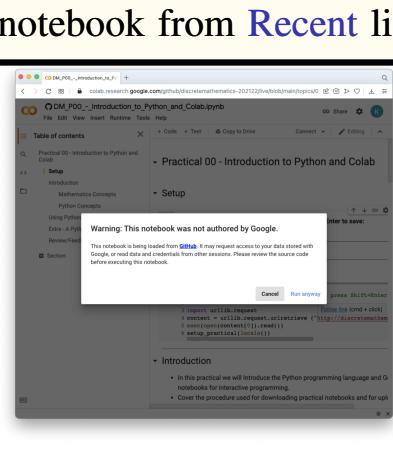
- Login before editing.
- Use a **different Google account** from your WIT linked student account.
- Use only one Google account<sup>†</sup> with Colab.











When you run a cell you will get a ‘This notebook was not authored by Google.’ warning:

- To edit (the just opened) notebook click on **Run Anyway**.
- To continue editing from a previous session, click **Cancel**, then select menu **File → Open notebook**, then select your notebook from **Recent** list.

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<sup>†</sup>Switching between Google accounts is a pain. To avoid this I use a separate browser for Colab work. The Opera browser is a good option.

## Step 3 — Enter Details and Run Practical Setup...

The screenshot shows a Google Colab notebook titled "DM\_P00\_-Introduction\_to\_Python\_and\_Colab.ipynb". The notebook contains several sections: "Setup", "Introduction", and a main content area. In the "Setup" section, there is a text input field with the placeholder "Please enter your following details and press Shift-Enter to save:". Inside this field, two entries are made: "your\_student\_number: 666" and "your\_name: kmurphy". Both of these entries are circled in red. In the main content area, there is a code cell with the following content:

```
[10]: # setup magic, do not edit this cell! Just press Shift+Enter or click on arrow at top-left
       import urllib.request
       content = urllib.request.urlopen("http://discretemathematics-202122.github.io/live/resource.html").read()
       exec(open(content[0]).read())
       setup_practical(locals())

```

Below the code cell, the output shows "Loading ..." followed by "Python practical setup tools version 2021.1. See [DiscreteMathematics-202122.github.io/live/](http://DiscreteMathematics-202122.github.io/live/)".

- In the first cell, enter your student number and name and execute the cell.
- Execute the second cell to complete the setup. You should see message:  
“Python practical setup tools ...”,  
The version number is currently 2021.1, but this will change.

# Outline

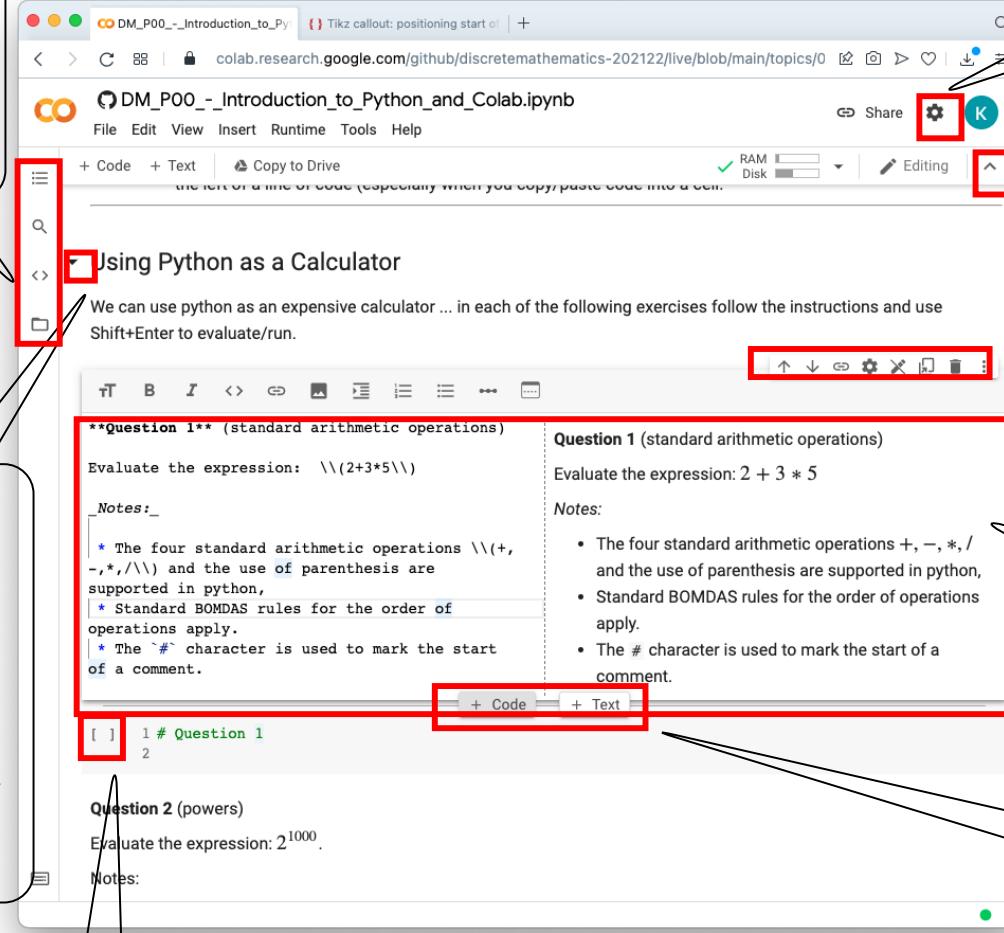
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# Edit and Working with Notebooks

Toolbar to show/hide table of contents, find/replace, code snippets, and files.

Click on the arrow to hide/show section. (This is called code folding.) When hidden see note for number of hidden cells.



Click on the [ ] or ⏪ to run the current cell.

# Review / Feedback

One disadvantage of going online is that students can lose out on opportunities to provide feedback on how they think the semester is progressing and in particular for **Discrete Mathematics**, how they easy/difficult, interesting/boring, useful/confusing they find the material. By completing the following you will help us improve our delivery.

Please enter your feedback and click on arrow at top-left to save.

**This practical**

How difficult did you find this practical?

`practical_difficulty:` Some bits were hard but overall it was doable

Including online session time, how long (in minutes) did it take for you to finish this practical?

`practical_duration:` 30

**This week's material**

How difficult did you find each of the following this week (0=too easy 3=easy, 5=just right, 7=a bit difficult, 10=impossible)?

`lecture_difficulty:` 0

`tutorial_questions_difficulty:` 0

Use the line below to enter any comments – what you liked, what you did not like. Again all feedback is welcome.

At the end of each notebook, we have a short questionnaire which we would like you to complete so that we can have a better idea as to how you are fairing. Everything entered here will be taken in the strictest confidence and we will do our best to address any issues. We are interested in:

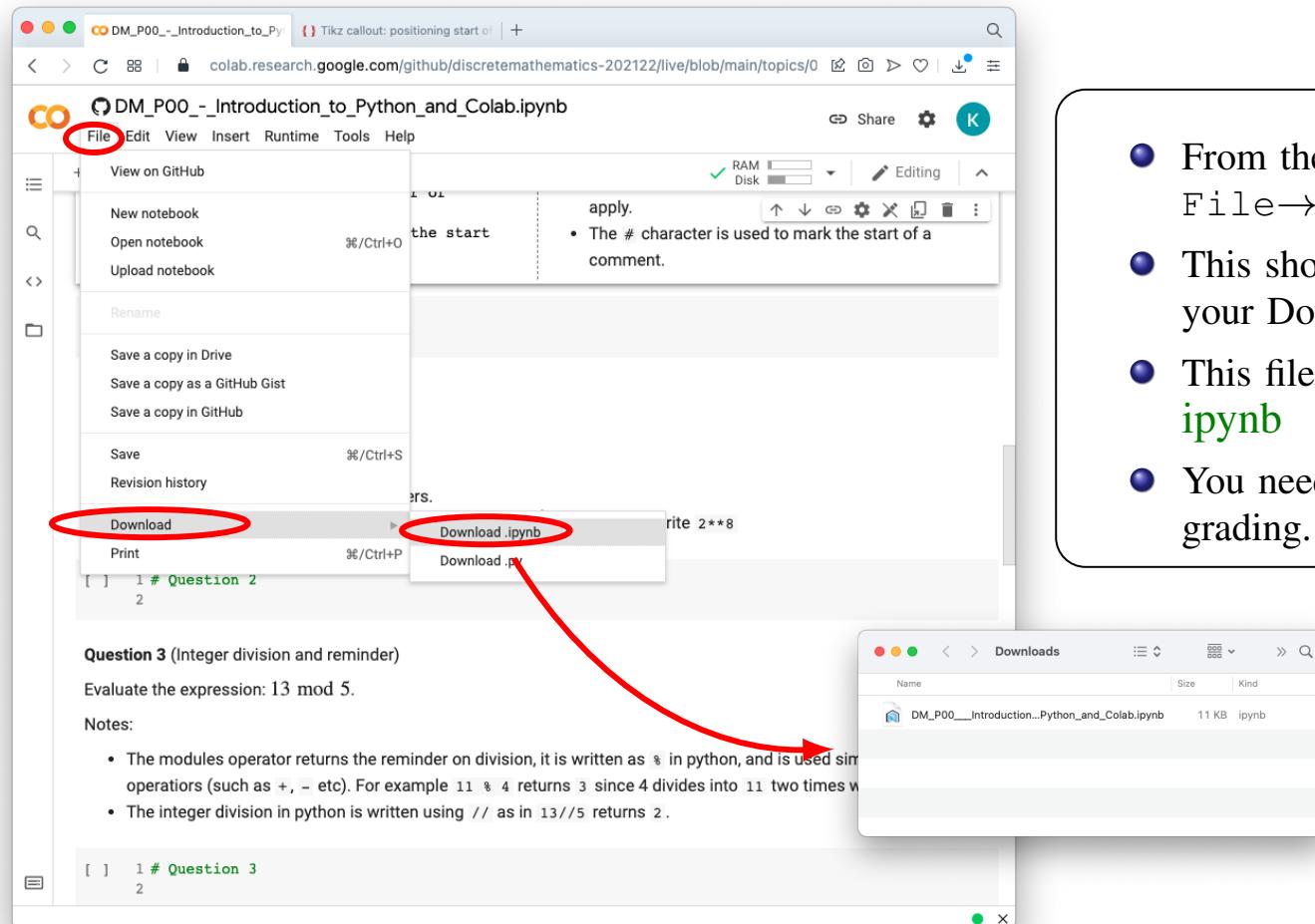
- Difficulty of material — are we assuming too much prior knowledge? do we need to give me examples? etc.
- The length of time you spend on the Discrete Mathematics activities — both spending too little and spending too much time on an activity is common.
- Is there anything that we should start/stop doing?

# Outline

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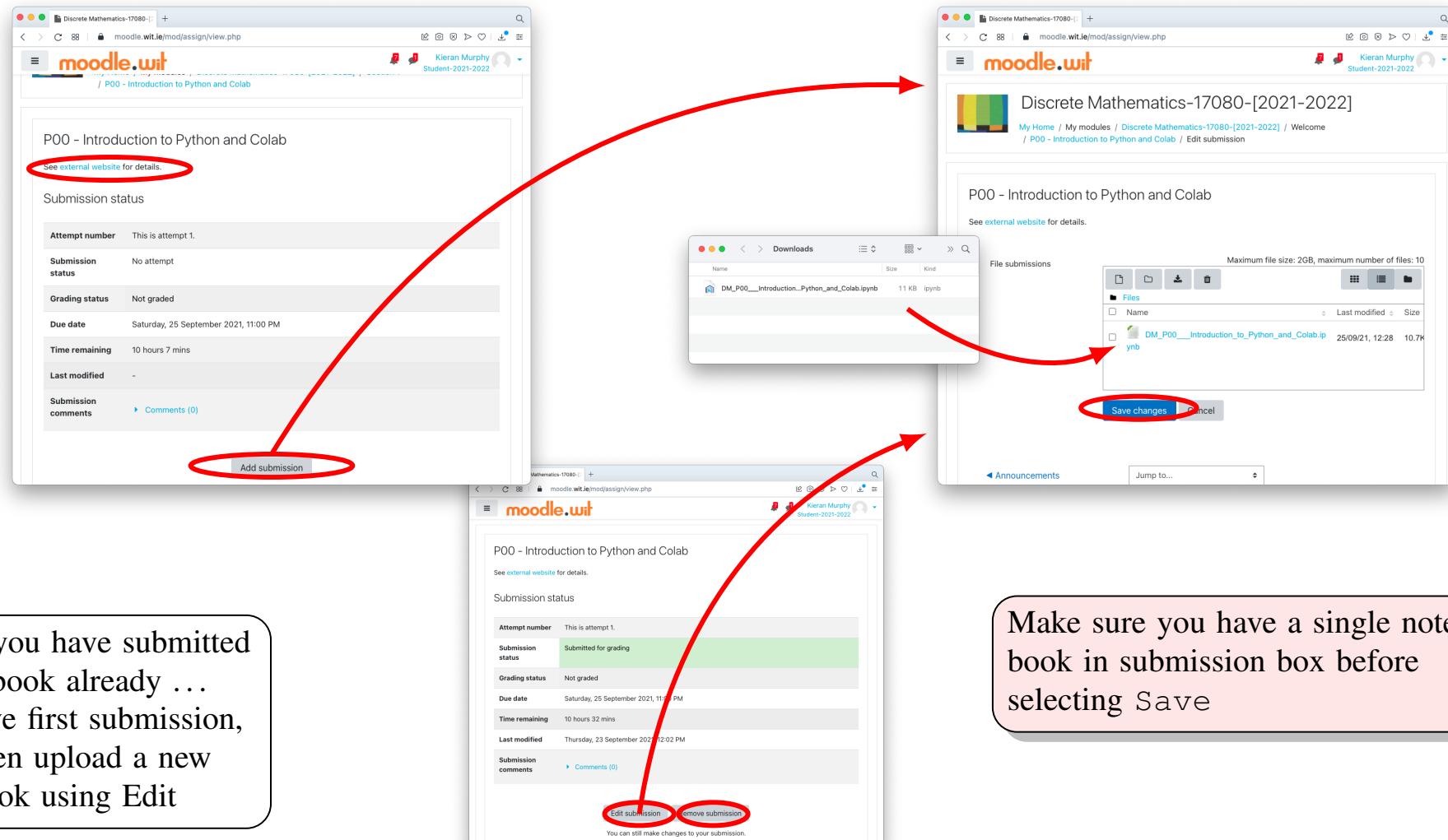
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# Download Notebook as a ipynb



- From the Colab menu select File→Download→Download ipynb.
- This should store a copy of your notebook in your Downloads folder.
- This file is a text encoded file with extension **ipynb**
- You need to upload this file to Moodle for grading.

# Uploading and Submission to Moodle



Or, if you have submitted a notebook already ...  
Remove first submission, and then upload a new notebook using Edit

Make sure you have a single notebook in submission box before selecting Save