

Logic

# Discrete Mathematics

Number Theory

Topic 00 — Module Introduction

Mathematical Proofs

## Lecture 31 — Guide to the Python Colab Practicals

Dr Kieran Murphy   

Recurrence Relations

Department of Computing and Mathematics,  
Waterford IT.  
([kmurphy@wit.ie](mailto:kmurphy@wit.ie))

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



- 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.

1. Locating and Opening Notebooks 3
  - Notebooks are listed on the Moodle main page and within topics on the Github website.
  - Clicking on Colab opens notebook in Colab.
  - Need a separate Google account to use colab.
  - Need to login and click on authorship warning before editing.
2. Edit and Working with Notebooks 7
  - A notebook is a list of cells which are either:
    - text** — contain markdown text, where markdown is a simple but effective technique to typeset content
    - code** — which contain python code to run.
  - The Colab interface has many features to help with editing notebooks, so it is worth spending some time just playing with it.
3. Downloading and Submitting Notebooks to Moodle 10
  - Colab automatically saves your notebook as you work, but you need to submit it to Moodle for grading.
  - Download python ipynb using the Colab menu option
  - Notebook should be saved to your Download folder.
  - Open Moodle and upload file.

## Step 1 — Locating and Opening Notebooks

Select notebook  
from list

Click on link to  
external website

Open notebook  
using Colab

Start from Moodle

moodle.wit

Discrete Mathematics-17080-[2021-2022]

Welcome

Latest announcements

23 Sep, 12:11  
Kiran Mulya  
This is a forum for group 00 cancelled  
Click here...

Assignments

Colab - Introduction to Python and Colab

moodle.wit

Discrete Mathematics-17080-[2021-2022]

P00 - Introduction to Python and Colab

See external website for details.

Attempt number: This is attempt 1.

Submission status: Submitted for grading

Grading status: Not graded

Due date: Saturday, 26 September 2021, 11:00 PM

Time remaining: 1 day 7 hours

Last modified: Thursday, 23 September 2021, 12:52 PM

Submission comments: 0

Practical 00 - Introduction to Python and Colab

Formula Sheet and Exam Papers

Open

Related Resources

Open

Practical 00 - Introduction to Python and Colab

Setup

Please enter your following details and press Shift-Enter to save:

your\_student\_number:

your\_name:

Show code

Introduction

Start from Github

Module Introduction

Logic

Methods of Mathematical Proof

Sets

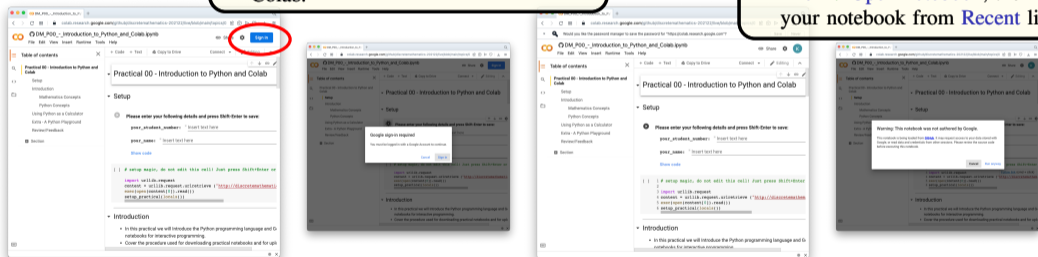
Navigate to required topic,  
then to required notebook

## 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.



<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\_POO\_-\_Introduction\_to\_Python\_and\_Colab.ipynb". The interface includes a menu bar (File, Edit, View, Insert, Runtime, Tools, Help) and a toolbar with options like Code, Text, Copy to Drive, RAM, Disk, and Editing. The notebook content is divided into sections: "Setup" and "Introduction".

In the "Setup" section, there is a prompt: "Please enter your following details and press Shift-Enter to save:". Below this prompt are two input fields: "your\_student\_number:" with the value "666" and "your\_name:" with the value "kmurphy". These fields are circled in red.

Below the input fields is a code cell with the following code:

```
[10] 1 # setup magic, do not edit this cell! Just press Shift+Enter or click on arrow at top-left
      2
      3 import urllib.request
      4 content = urllib.request.urlopen("http://discretemathematics-202122.github.io/live/resourc
      5 exec(open(content[0]).read())
      6 setup_practical(locals())
```

The output of the code cell shows "Loading ..." and "Python practical setup tools version 2021.1. See [DiscreteMathematics-202122.github.io/live](http://DiscreteMathematics-202122.github.io/live)". This output is also circled in red.

The "Introduction" section contains the following text:

- In this practical we will introduce the Python programming language and Google's colab notebooks for interactive programming.
- Cover the procedure used for downloading practical notebooks and for uploading completed notebooks to [moodle](#).

The notebook status bar at the bottom indicates "0s completed at 18:19".

- 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.

## 1. Locating and Opening Notebooks

3

- Notebooks are listed on the Moodle main page and within topics on the Github website.
- Clicking on Colab opens notebook in Colab.
- Need a separate Google account to use colab.
- Need to login and click on authorship warning before editing.

## 2. Edit and Working with Notebooks

7

- A notebook is a list of cells which are either:
  - text** — contain markdown text, where markdown is a simple but effective technique to typeset content
  - code** — which contain python code to run.
- The Colab interface has many features to help with editing notebooks, so it is worth spending some time just playing with it.

## 3. Downloading and Submitting Notebooks to Moodle

10

- Colab automatically saves your notebook as you work, but you need to submit it to Moodle for grading.
- Download python ipynb using the Colab menu option
- Notebook should be saved to your Download folder.
- Open Moodle and upload file.

# Edit and Working with Notebooks

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

Click to access setting including hide/show line numbers

Click to hide/show menu & ribbon

This toolbar appears when editing a cell. Buttons move cell up / down, delete etc.

When editing a text cell, the cells splits into two — the left is the source (in markdown) and the right is the generated output.

Move mouse pointer to centre of top or bottom edge of cell to insert a code (or text) cell in that location.

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.

The screenshot shows a Jupyter Notebook interface with the following elements highlighted:

- Left sidebar:** A vertical toolbar containing icons for table of contents, search, code snippets, and files.
- Top right:** A settings gear icon and a user profile icon.
- Section header:** A red box highlights the title "Using Python as a Calculator" and a small arrow icon next to it.
- Cell toolbar:** A red box highlights a toolbar above the code cell containing icons for moving up/down, deleting, and other actions.
- Code cell:** A red box highlights the code cell content, which is split into two panes: source code on the left and generated output on the right.
- Code cell footer:** A red box highlights the footer of the code cell, showing a "+" icon and a "Code" label.
- Bottom left:** A red box highlights the run button (a play icon) and the cell selection brackets [ ] at the bottom left of the code cell.



# Review / Feedback

One of 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

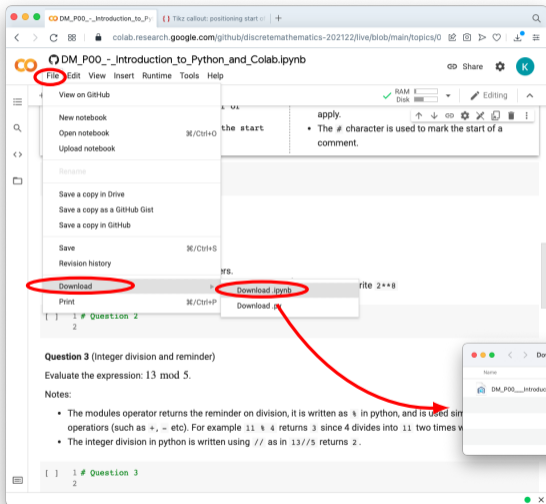
Use the line below to enter any comments – what you liked, what you did not like. Again all feedback is welcome.

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?

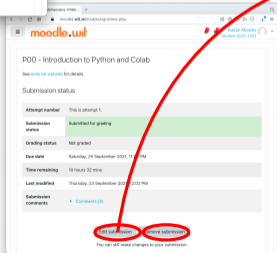
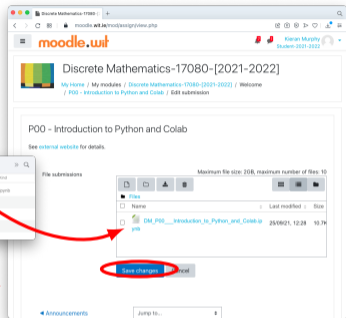
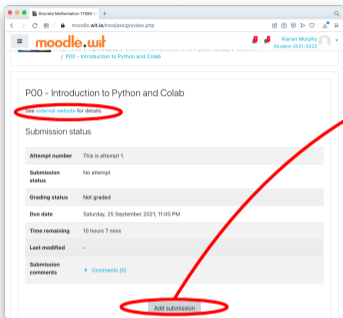
1. Locating and Opening Notebooks 3
  - Notebooks are listed on the Moodle main page and within topics on the Github website.
  - Clicking on Colab opens notebook in Colab.
  - Need a separate Google account to use colab.
  - Need to login and click on authorship warning before editing.
2. Edit and Working with Notebooks 7
  - A notebook is a list of cells which are either:
    - text** — contain markdown text, where markdown is a simple but effective technique to typeset content
    - code** — which contain python code to run.
  - The Colab interface has many features to help with editing notebooks, so it is worth spending some time just playing with it.
3. Downloading and Submitting Notebooks to Moodle 10
  - Colab automatically saves your notebook as you work, but you need to submit it to Moodle for grading.
  - Download python ipynb using the Colab menu option
  - Notebook should be saved to your Download folder.
  - Open Moodle and upload file.

# 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