

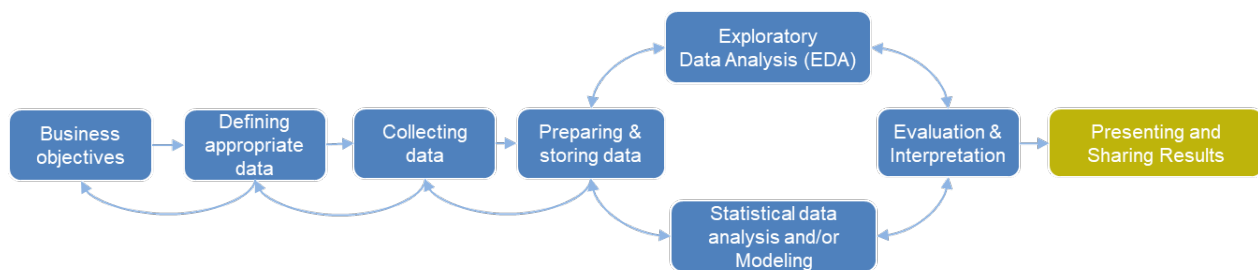
# Data Analytics – Exercises

## (Week 12)

In these exercises, you will learn:

- how to run and share a Jupyter notebook on Google Colab
- how to share a Jupyter notebook using Git and GitHub
- how to use Python and flask to run a simple web application
- how to use plotly and Dash to run a simple web application

In the data analytics process model, these exercises cover part of the step “Presenting and Sharing Results” (see figure 1). Results of the exercises must be uploaded as separate files (**no .zip files!**) by each student on Moodle. Details on how to submit the results can be found in the tasks below.

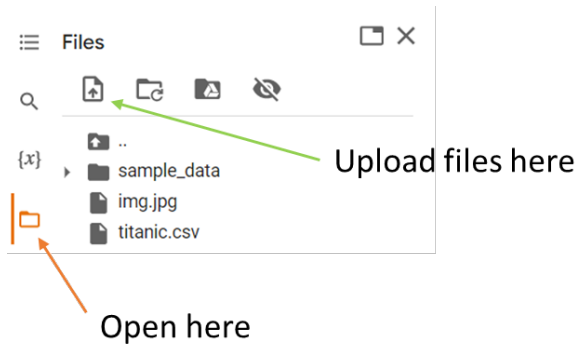


**Figure 1:** Data analytics process model (see slides of week 01)

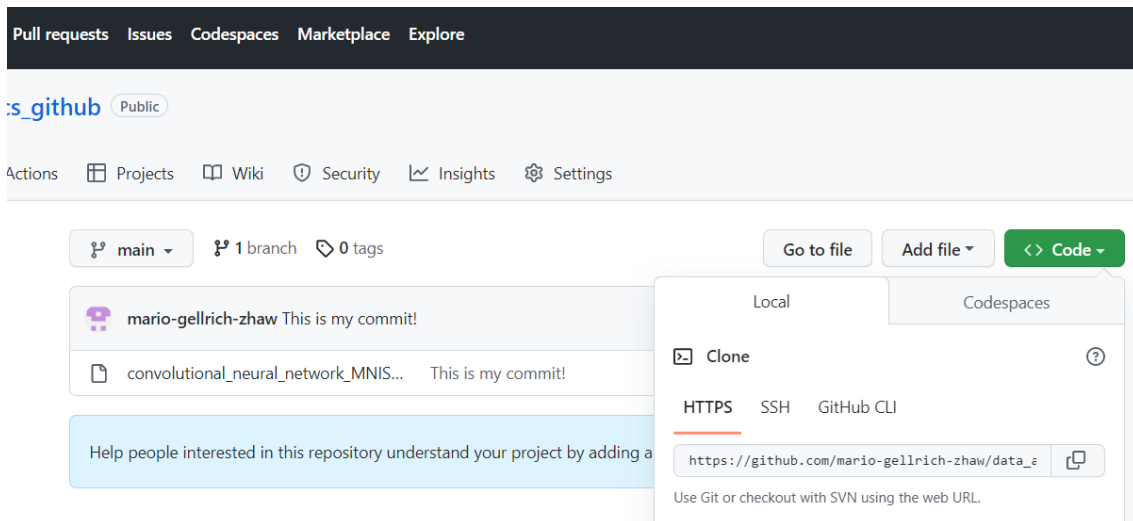
### Task 1

In this exercise, you will learn to run and share a Jupyter notebook on Google Colab. In addition, you will learn to share a Jupyter notebook using Git and GitHub. The tasks are:

- a) Create a Google account (or use your existing Google account).
- b) Navigate to the Google Colab webpage <https://colab.research.google.com>.
- c) If only available in German, change the language to English.  
(Google Colab -> Main Menu -> Hilfe -> Auf Englisch ansehen)
- d) Upload the Jupyter notebook with the titanic example from week 09.  
(Google Colab -> Main Menu -> File -> Upload Notebook)
- e) Upload the two files 'titanic.csv' and 'img.jpg' from week 09 (see graphic below).  
(Google Colab -> Left sided Menu -> Folder Symbol -> Upload to session storage)



- f) Run the 'titanic' Jupyter notebook on Google Colab.  
(Google Colab -> Main Menu -> Runtime -> Run all)
- g) Create a Shared-Link to the Google Colab Jupyter notebook and save it.  
(Google Colab -> Upper Right Menu -> Share)
- h) Run the Jupyter notebook '[convolutional\\_neural\\_network\\_MNIST.ipynb](#)' in your local conda environment and try to understand what the Python code does.
- i) Follow the instructions in the file 'github\_create\_new\_repository.txt' on Moodle to make the Jupyter notebook available on GitHub.
- j) On GitHub, set the visibility of the new repository to 'public'.
- k) Get the URL to the GitHub repository (see screenshot below).  
(here, my URL is: [https://github.com/mario-gellrich-zhaw/data\\_analytics\\_github.git](https://github.com/mario-gellrich-zhaw/data_analytics_github.git))



### To be submitted on Moodle:

- The Shared-Link (URL) to your 'titanic' Jupyter notebook on Google Colab.
- The Shared-Link (URL) to your public GitHub repository with the Jupyter notebook.

## Task 2

In this exercise, you will learn to use Python and flask to run web applications to create graphics and deploy a simple Machine-Learning (ML) model. In addition, you will learn

how plotly and Dash can be used to create a simple web application showing interactive graphics.

The tasks are:

- a) Open the Anaconda console and activate your conda environment. Note that you don't need a Jupyter notebook for the following exercises.
- b) Install the following additional Python libraries using the Anaconda console:

```
pip install flask_wtf  
pip install joblib  
pip install dash
```

- c) In the following folders (provided on Moodle) you can find README.txt – files with short instructions how to run the flask and plotly/Dash web applications. Use the Anaconda console to run the web applications in the following order:

1. flask\_simple\_application
2. flask\_matplotlib\_example
3. flask\_iris\_model\_example
4. flask\_dash\_example

- d) Create screenshots of each web application running in your web browser.

**To be submitted on Moodle:**

- A screenshot of the 1<sup>st</sup> web application named '[flask\\_simple\\_application.png](#)'
- A screenshot of the 2<sup>nd</sup> web application named '[flask\\_matplotlib\\_example.png](#)'
- A screenshot of the 3<sup>rd</sup> web application named '[flask\\_iris\\_model\\_example.png](#)'
- A screenshot of the 4<sup>th</sup> web application named '[flask\\_dash\\_example.png](#)'