

# wat\_bal

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A repository for a conceptual hydrological model. (Exercise 2 Watershed Modelling, ETH Zurich)

## Instructions set up Environemnt

1. Download the zip file wat\_bal\_python.zip and extract it.
2. Install python 3.7.6 (Required)[Its Free!](#)
  - To check that python is installed on your desktop:
    - For Mac open terminal and type pyrhon3 (Mac comes with preinstalled python 2.7.6 but you still need to install python 3.7.6)
    - For Windows 10, open Windows Power Shell and then type Python
3. Install Visual Studio Code (Recommended)[Its Free!](#)
  - Visual Studio Code is an editor and will comes with autocomplete and syntax highlighting features
  - Any other editor should work as well but from here on the setup will be in Visual Studio Code
  - Download the version depending on your OS.
4. Setting up the project. Installing packages.
  - Open Terminal/Windows Power Shell
  - Install pipenv by running "pip3 install pipenv" (without quotes) in Terminal/Windows Power Shell
  - Open Visual Studio Code
  - A welcome screen will appear, in the left side bar select the Extension (icon with 4 squares)
  - Search Python. Select Python (Linting, Debugging,..)
  - Once it is installed open Explorer on the top left bar. (shift+ctrl+e)
  - Select Open Folder, Browse to the directory water\_bal\_python.
  - The folder should contain Pipfile and Pipfile.lock
  - Go to Terminal at the top and select new terminal
  - Terminal will open at the bottom, Run the command "pipenv install"
  - This step may take some time and the internet connection is required
  - Restart the VSCode. Now on the lef side of blue colored bottom bar you can see the python version adn in bracket name of the folder along with pipenv. ('wat\_bal\_python:pipenv')

## Instruction to run the scripts

- There are 5 scripts namely model.py, plots.py, utils.py run\_opt.py, run\_param\_plot.py, run\_sim.py and two folders name data and plots.
- All the required data is in the data folder.
- All the plots will be created in the plots folder
- Two more files will be added namely parameter.h5 and gof.csv
- Parameter.h5 will have the list of parameters for different runs
- gof.csv will contain the goodness of fit values for observation and simulation
- Run the scripts in order
  - (run\_opt.py) run\_opt will optimize the model and save the value of parameters in Parameters.h5

- Number of runs (nruns) needs to be selected here. Roughly it takes 70-120 runs per iteration depending on the computer.
- (run\_param\_plot.py) run\_param\_plot will generate the plots of the parameters
- Seeing the histogram of parameters chose the value of the parameter and add the values to the script run\_sim.py
- (run\_sim.py) Run the script run\_sim.py to save the plots and gof values
- Any change in the structure of the model needs to be made in model.py
- For adding parameters to calibrate some changes also needs to be made in run\_opt.py and run\_sim.py