

HAS Tools:

More numpy and matplotlib

Sept 20, 2022

Reminder:

Homeworks are due today @ midnight

- There are 3 parts

Reminder:

Homeworks are due today @ midnight

- There are 3 parts
- 1. Submit your cheat sheet to your homework repo under `Cheat_Sheets`

Reminder:

Homeworks are due today @ midnight

- There are 3 parts
- 1. Submit your cheat sheet to your homework repo under `Cheat_Sheets`
- 2. Submit your forecast code to your homework repo under `Forecast_Submissions`

Reminder:

Homeworks are due today @ midnight

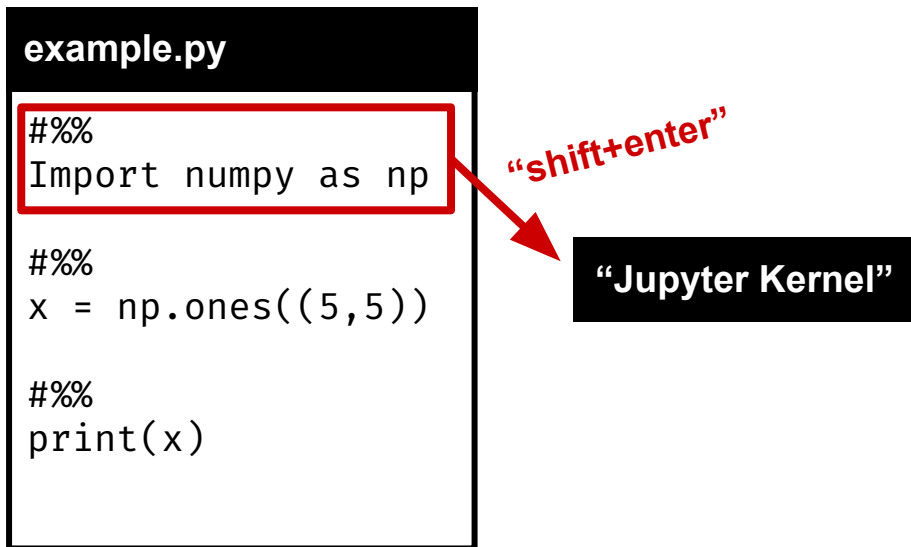
- There are 3 parts
- 1. Submit your cheat sheet to your homework repo under `Cheat_Sheets`
- 2. Submit your forecast code to your homework repo under `Forecast_Submissions`
- 3. Submit your forecast values to the `forecasting22` repo in your forecast value CSV file

But first, how does **vscode:jupyter:conda** work?

example.py

```
#%%  
Import numpy as np  
  
#%%  
x = np.ones((5,5))  
  
#%%  
print(x)
```

But first, how does **vscode:jupyter:conda** work?



But first, how does **vscode:jupyter:conda** work?

```
example.py
#%%
Import numpy as np

#%%
x = np.ones((5,5))

#%%
print(x)
```

“shift+enter”


“Jupyter Kernel”

Conda Environments

But first, how does **vscode:jupyter:conda** work?

example.py

```
#%%  
Import numpy as np  
  
#%%  
x = np.ones((5,5))  
  
#%%  
print(x)
```



“Jupyter Kernel”

Conda Environments

base

-python

But first, how does **vscode:jupyter:conda** work?

example.py

```
#%%  
Import numpy as np
```

```
#%%  
x = np.ones((5,5))
```

```
#%%  
print(x)
```

“Jupyter Kernel”

Conda Environments

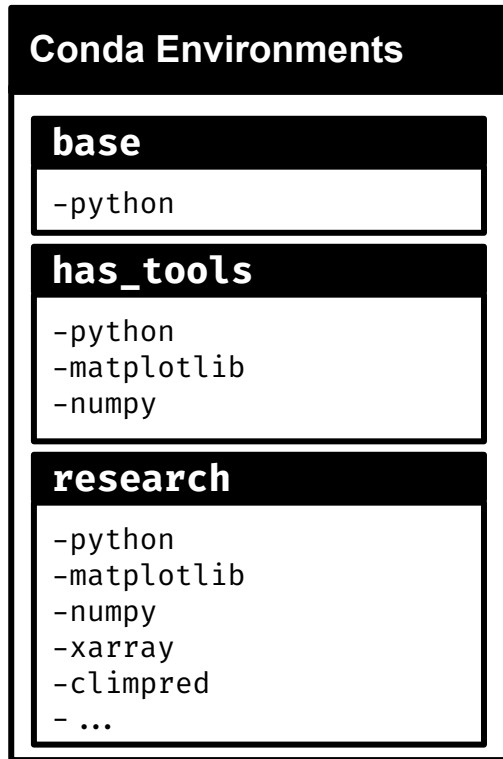
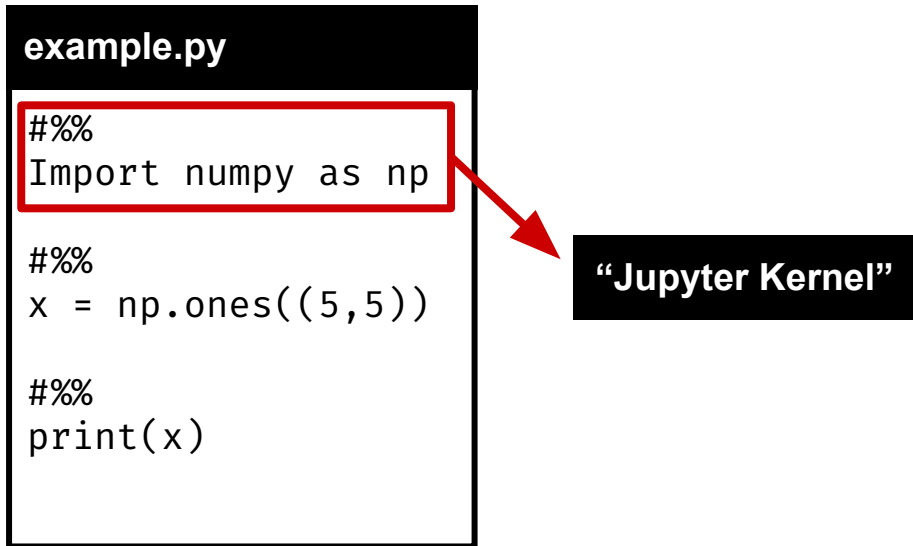
base

-python

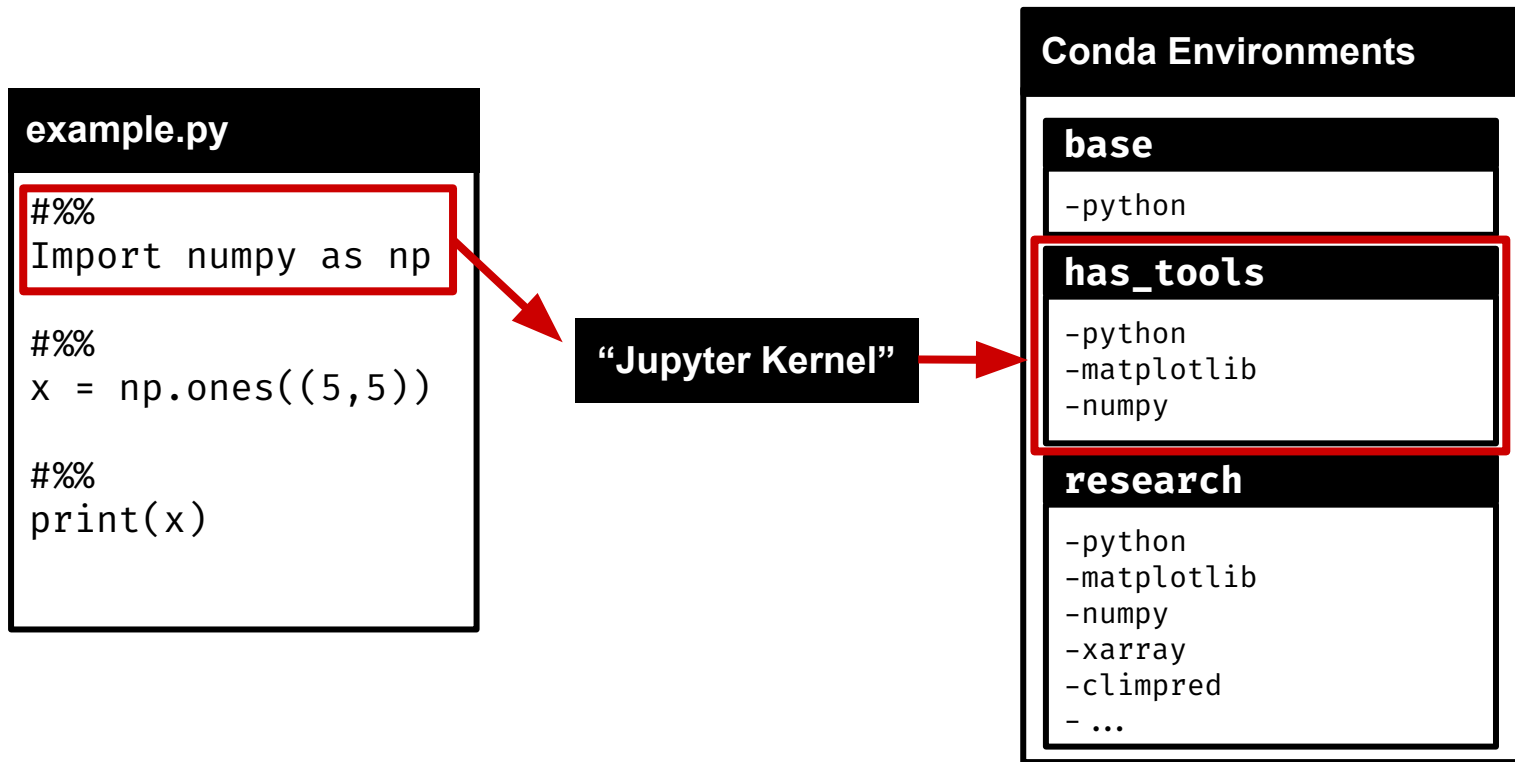
has_tools

-python
-matplotlib
-numpy

But first, how does **vscode:jupyter:conda** work?



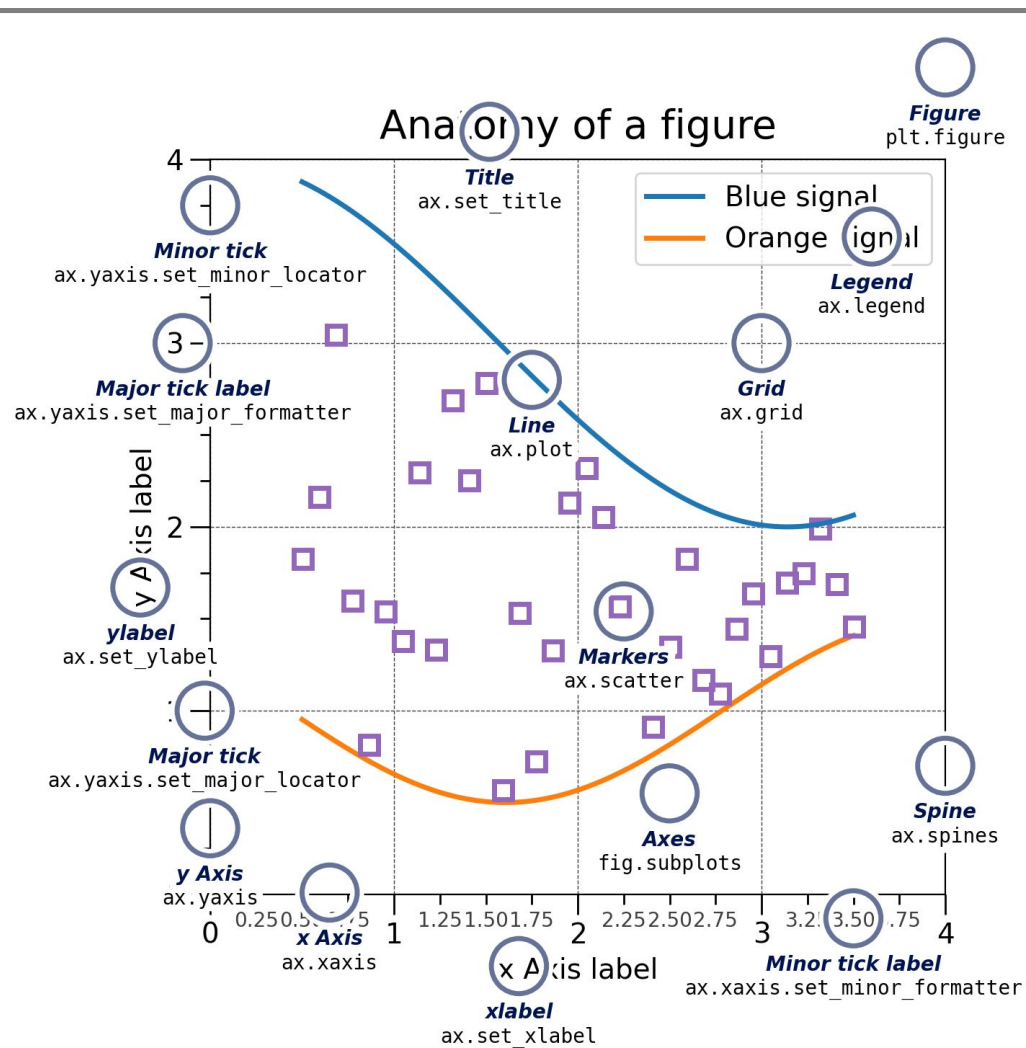
But first, how does **vscode:jupyter:conda** work?



Anatomy of a matplotlib plot

<https://matplotlib.org/stable/gallery/showcase/anatomy.html>

Anatomy of a matplotlib plot



Matplotlib figures can have multiple axes!

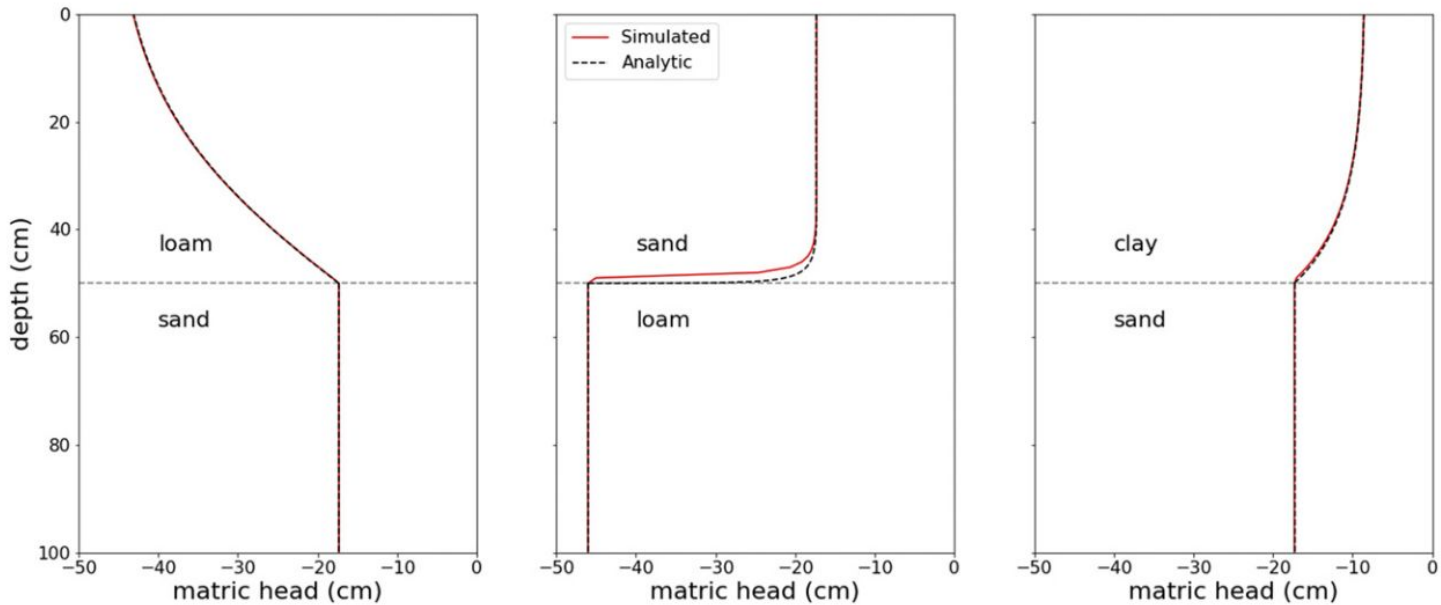


FIG. 4. Solution of the three test problems from [Vanderborght et al. \(2005\)](#), showing the vertical profiles of pressure head at steady state. The solid red lines are the model simulations, and the dashed black lines are the analytical solutions.

Matplotlib figures can have multiple axes!

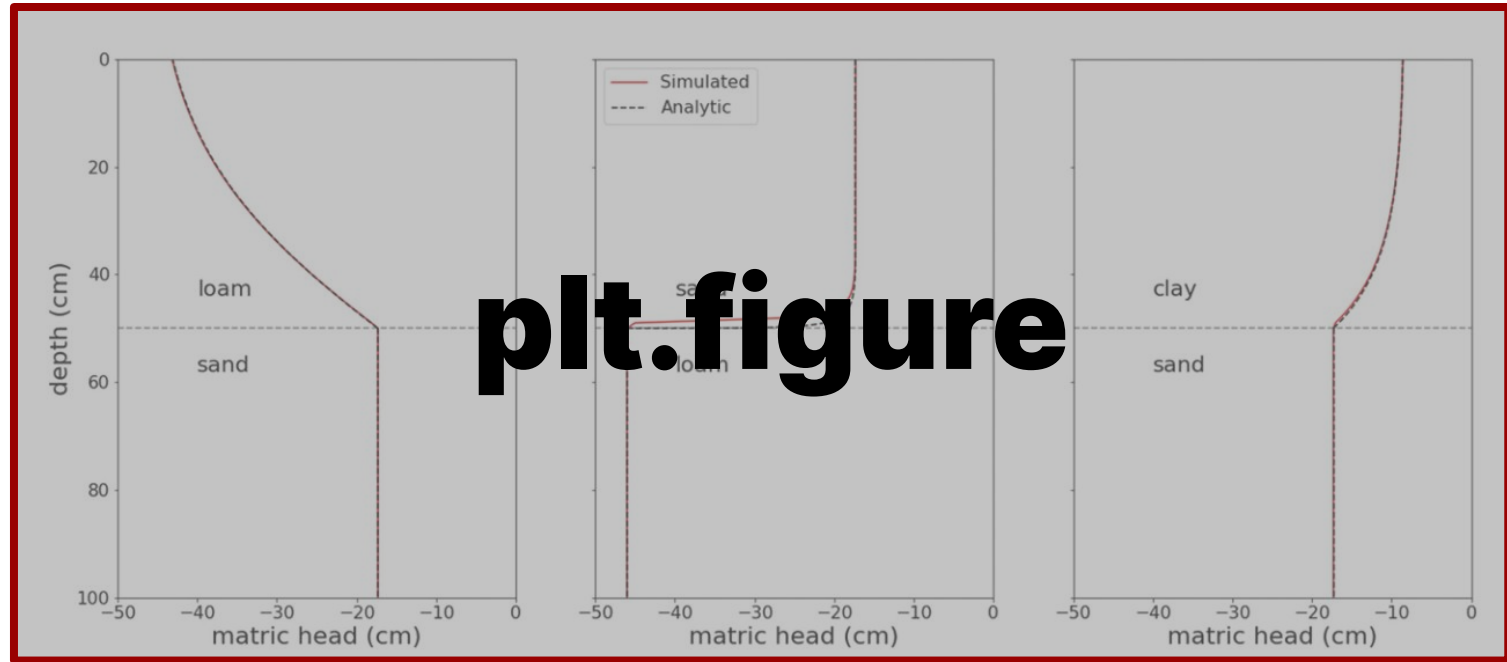


FIG. 4. Solution of the three test problems from [Vanderborght et al. \(2005\)](#), showing the vertical profiles of pressure head at steady state. The solid red lines are the model simulations, and the dashed black lines are the analytical solutions.

Matplotlib figures can have multiple axes!

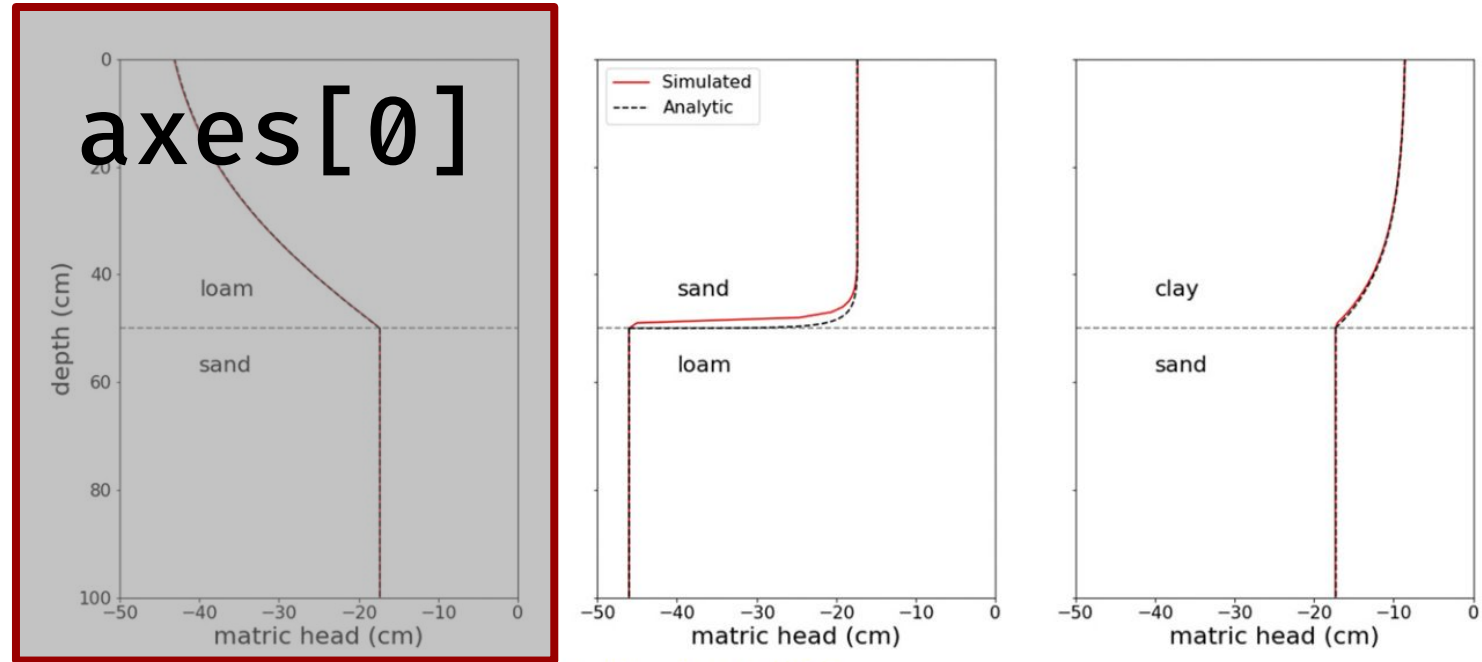


FIG. 4. Solution of the three test problems from [Vanderborght et al. \(2005\)](#), showing the vertical profiles of pressure head at steady state. The solid red lines are the model simulations, and the dashed black lines are the analytical solutions.

Matplotlib figures can have multiple axes!

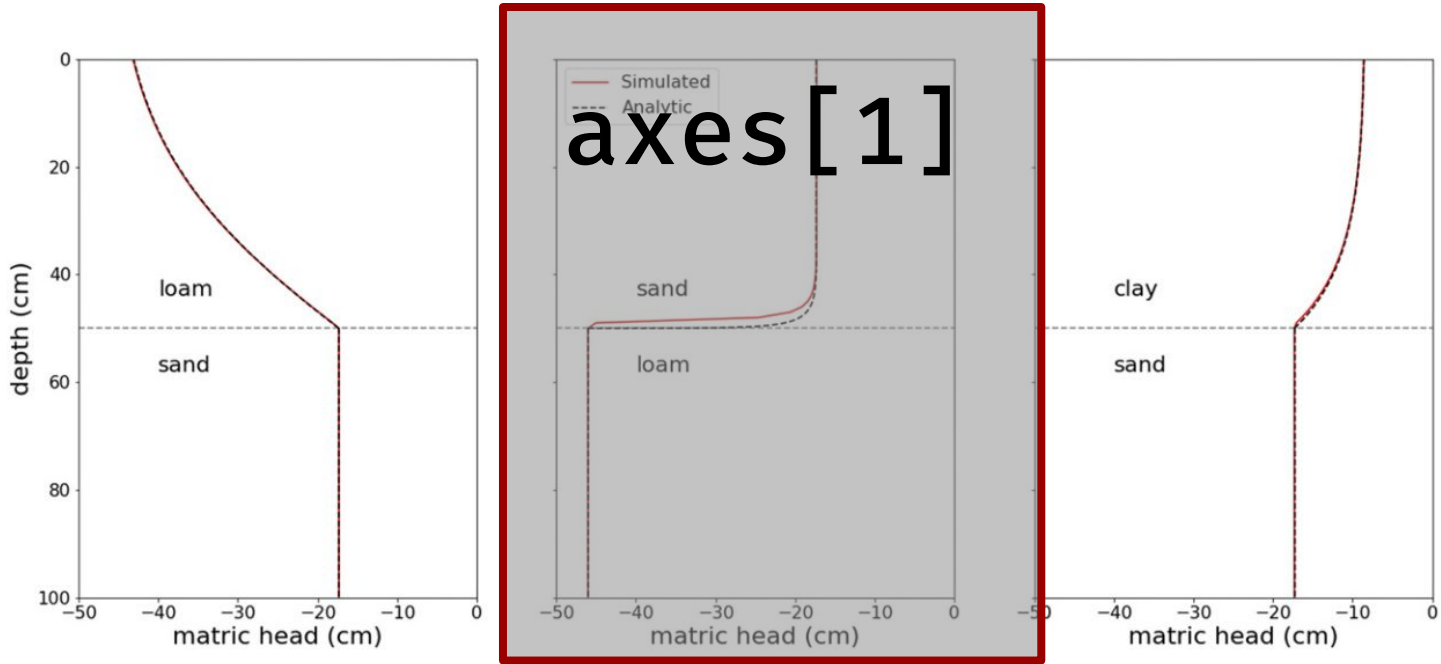


FIG. 4. Solution of the three test problems from Vanderborght et al. (2005), showing the vertical profiles of pressure head at steady state. The solid red lines are the model simulations, and the dashed black lines are the analytical solutions.

Matplotlib figures can have multiple axes!

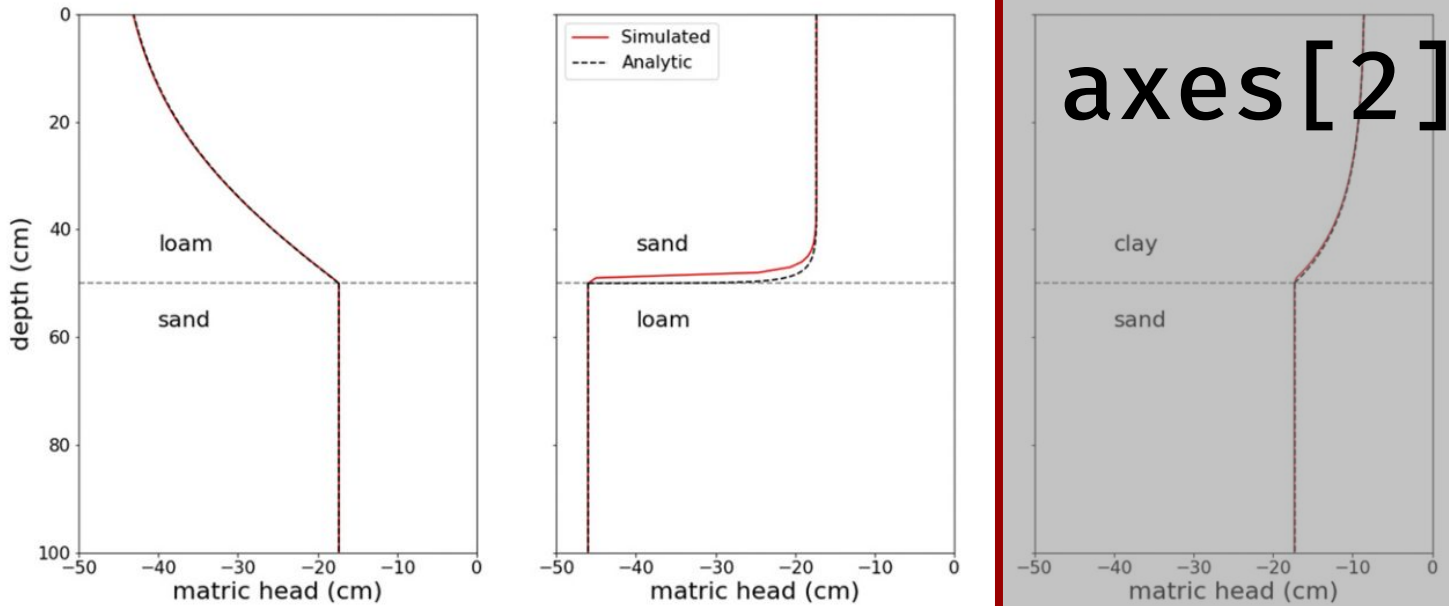


FIG. 4. Solution of the three test problems from [Vanderborght et al. \(2005\)](#), showing the vertical profiles of pressure head at steady state. The solid red lines are the model simulations, and the dashed black lines are the analytical solutions.

Matplotlib figures can have multiple axes!

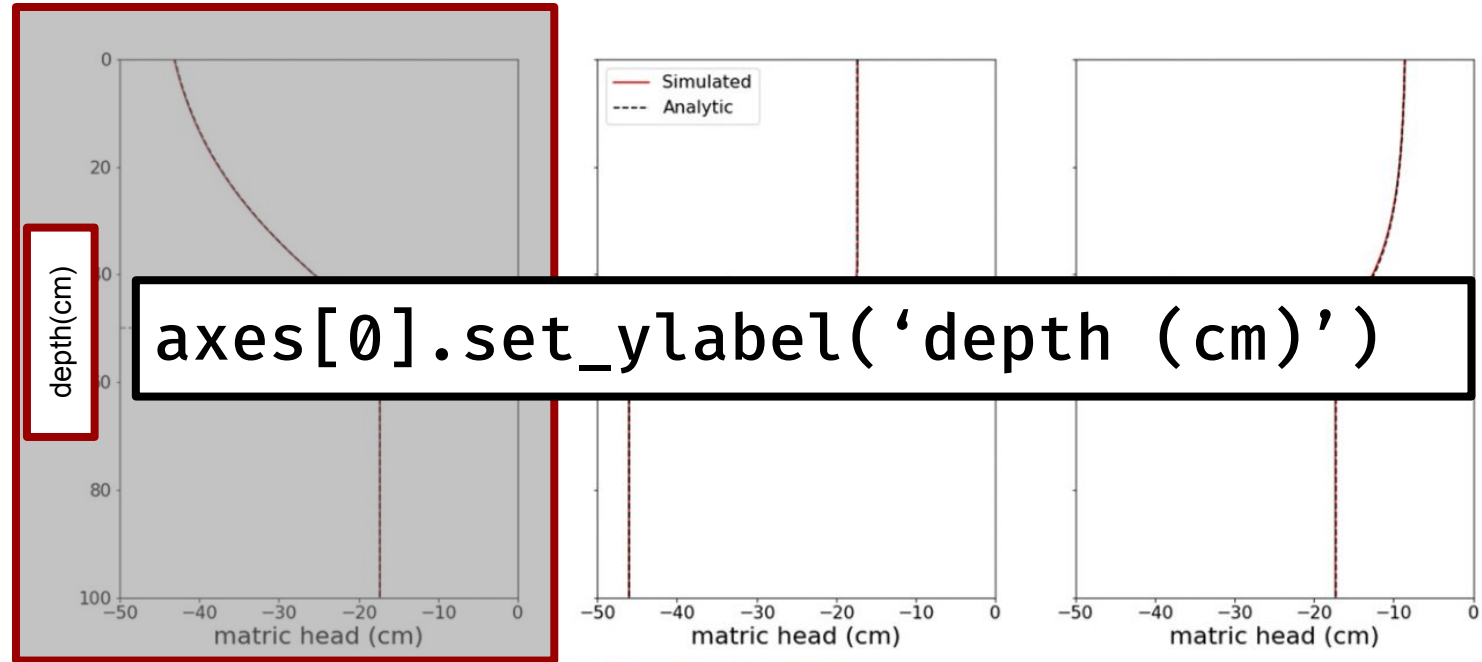


FIG. 4. Solution of the three test problems from [Vanderborght et al. \(2005\)](#), showing the vertical profiles of pressure head at steady state. The solid red lines are the model simulations, and the dashed black lines are the analytical solutions.

Matplotlib figures can have multiple axes!

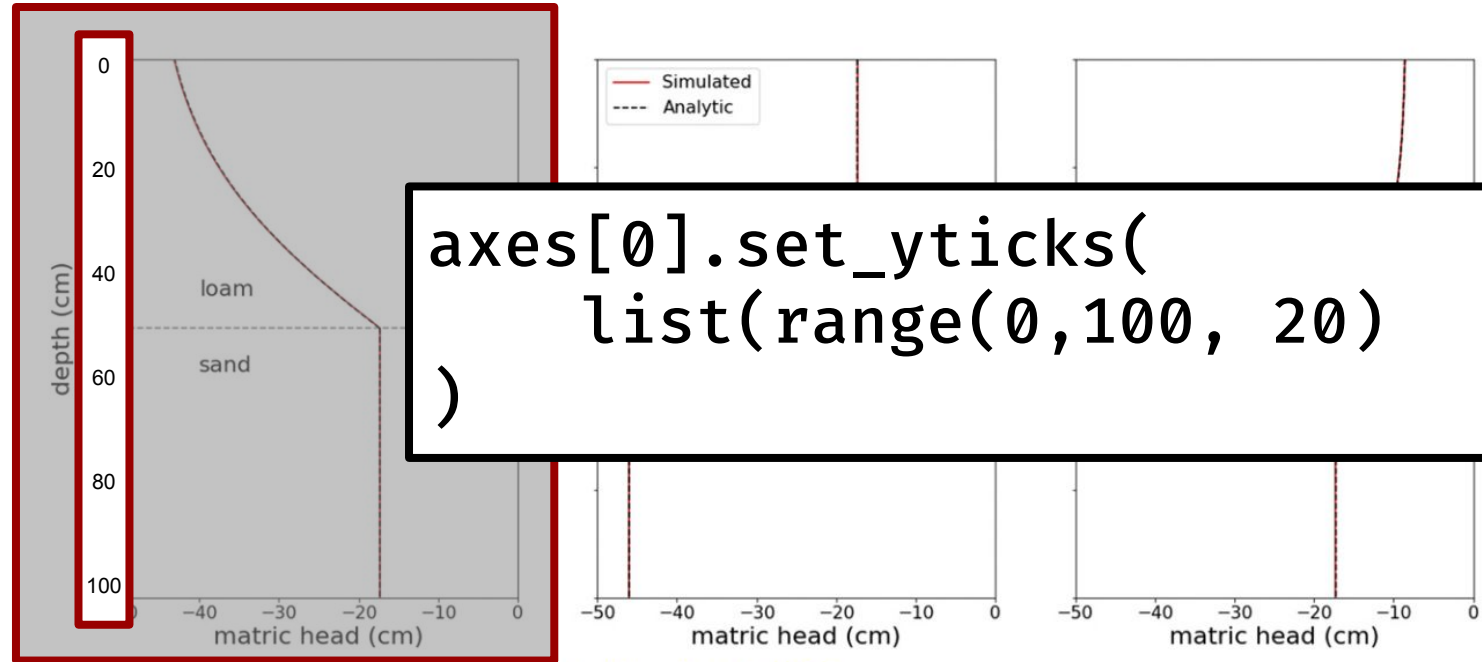


FIG. 4. Solution of the three test problems from [Vanderborght et al. \(2005\)](#), showing the vertical profiles of pressure head at steady state. The solid red lines are the model simulations, and the dashed black lines are the analytical solutions.

Matplotlib figures can have multiple axes!

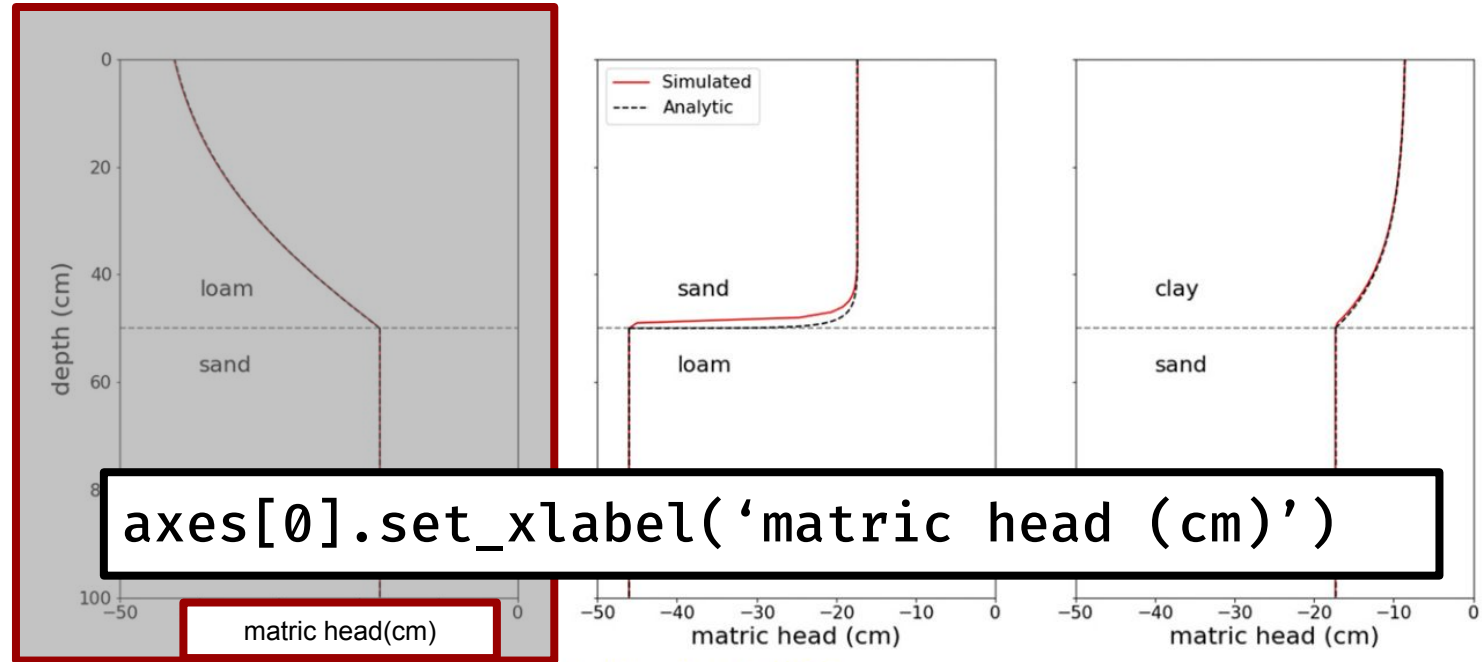


FIG. 4. Solution of the three test problems from [Vanderborght et al. \(2005\)](#), showing the vertical profiles of pressure head at steady state. The solid red lines are the model simulations, and the dashed black lines are the analytical solutions.

Matplotlib figures can have multiple axes!

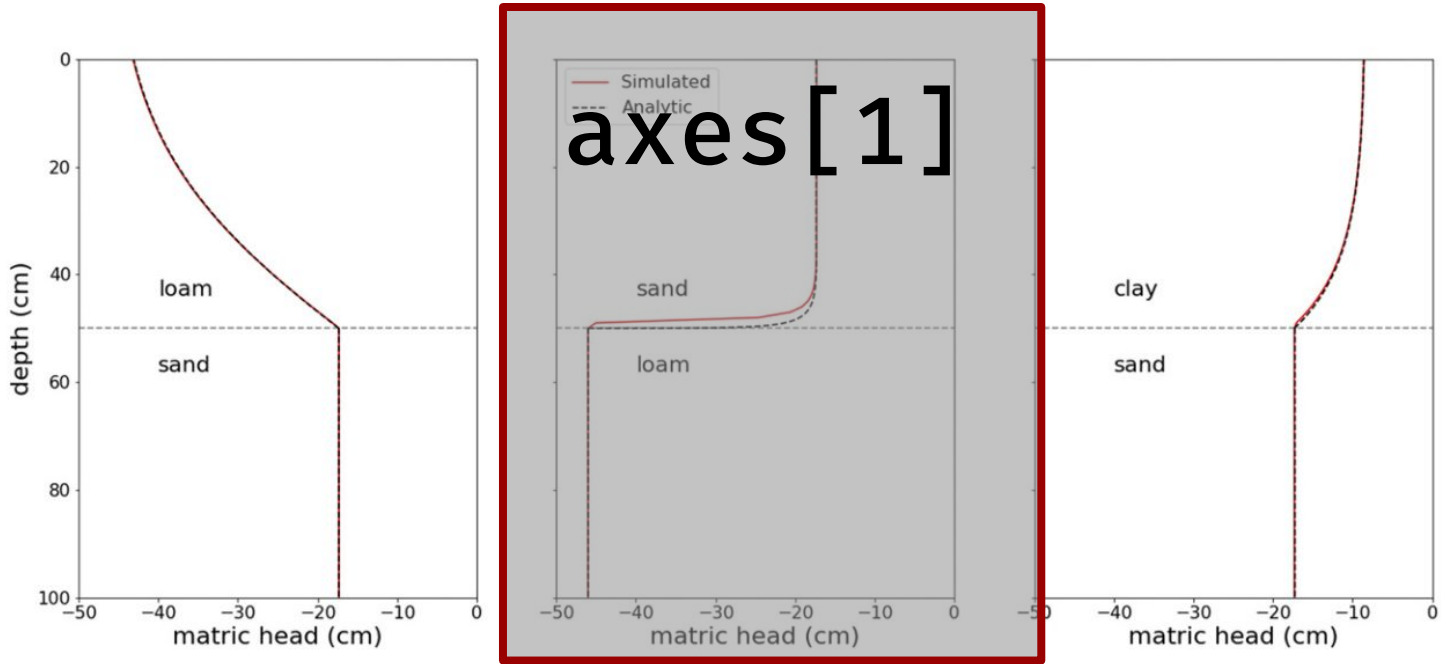


FIG. 4. Solution of the three test problems from [Vanderborght et al. \(2005\)](#), showing the vertical profiles of pressure head at steady state. The solid red lines are the model simulations, and the dashed black lines are the analytical solutions.

Matplotlib figures can have multiple axes!

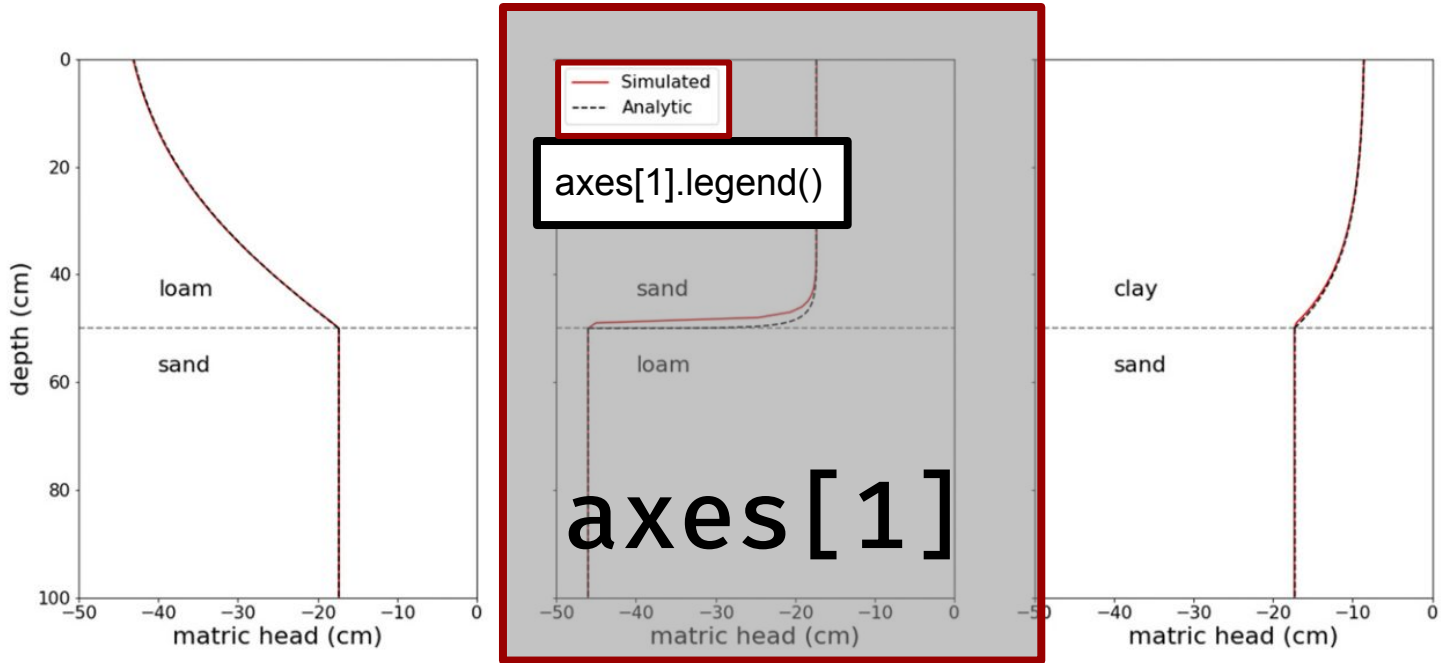


FIG. 4. Solution of the three test problems from Vanderborght et al. (2005), showing the vertical profiles of pressure head at steady state. The solid red lines are the model simulations, and the dashed black lines are the analytical solutions.

Matplotlib figures can have multiple axes!

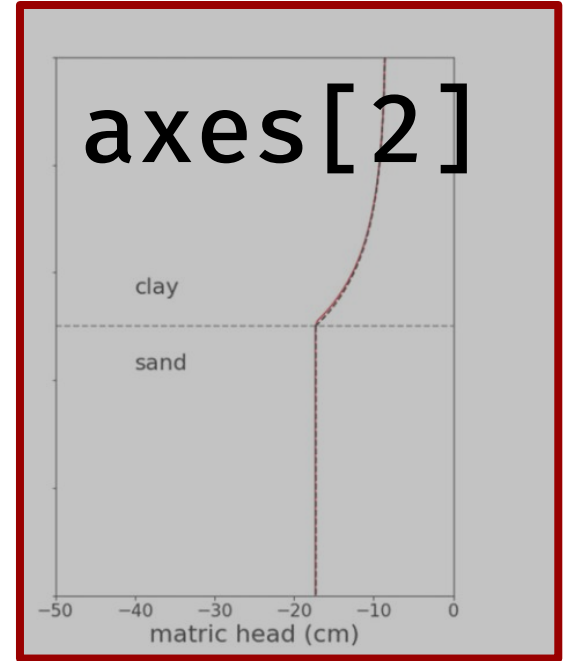
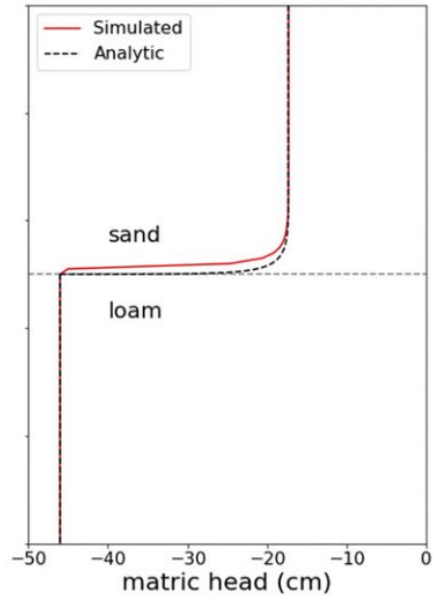
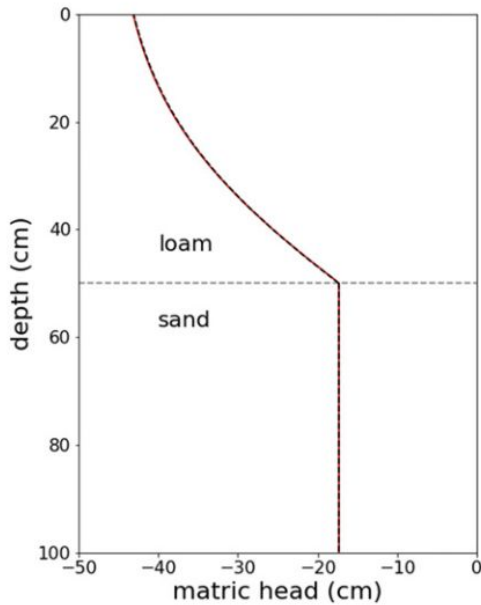


FIG. 4. Solution of the three test problems from [Vanderborght et al. \(2005\)](#), showing the vertical profiles of pressure head at steady state. The solid red lines are the model simulations, and the dashed black lines are the analytical solutions.

It can get way more complicated...

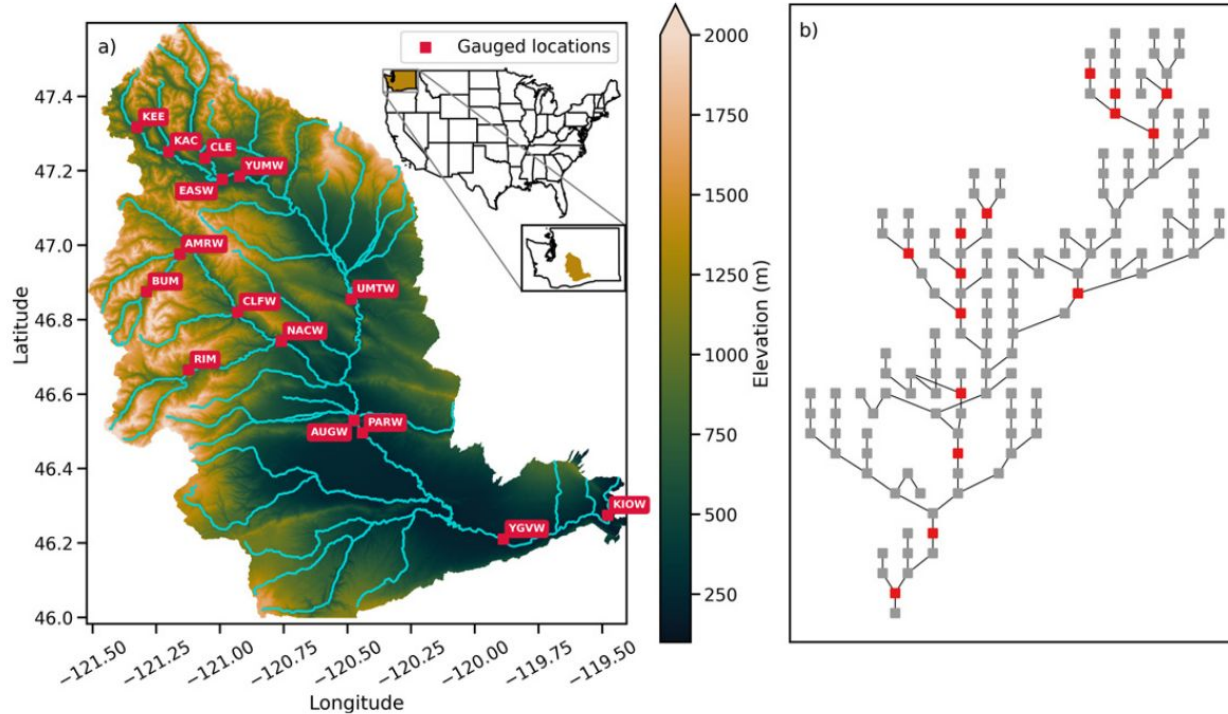


FIG. 2. (a) Yakima River basin map. Gauged sites are shown in red and are labeled with their stream gauge abbreviations. (b) The stream network topology, with gauged locations highlighted in red.

It can get way more complicated...

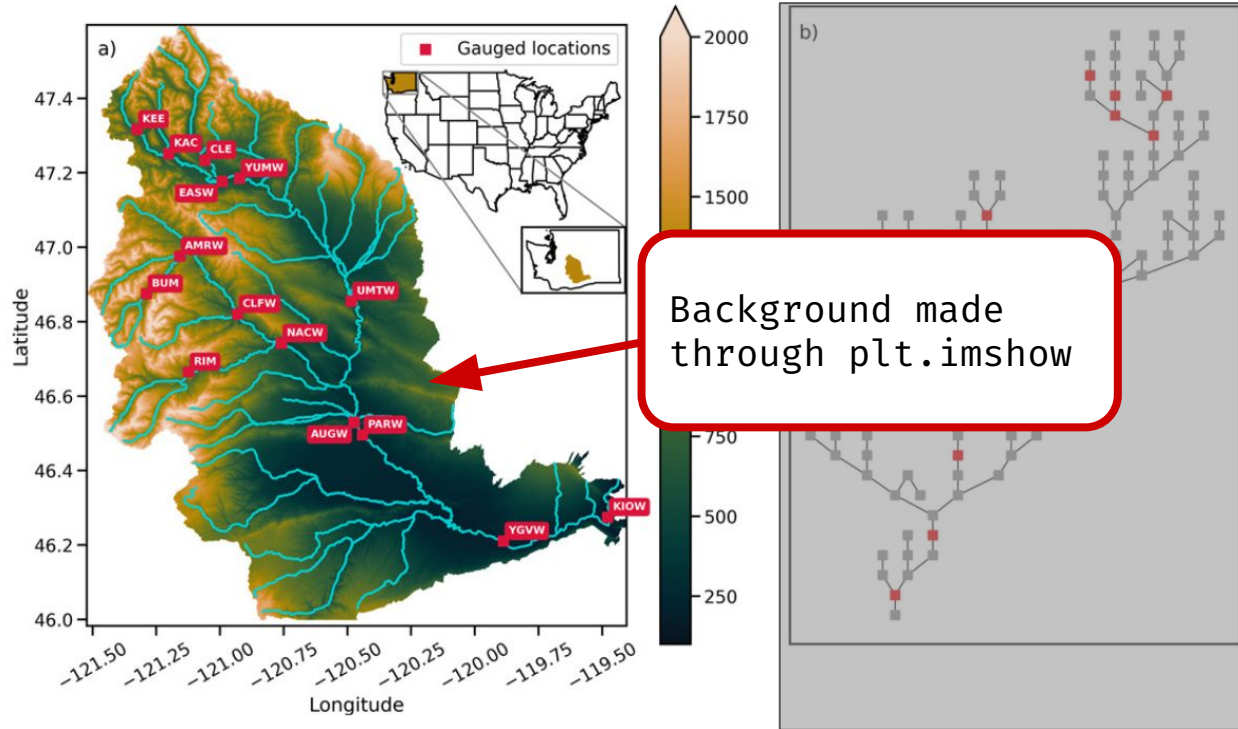


FIG. 2. (a) Yakima River basin map. Gauged sites are shown in red and are labeled with their stream gauge abbreviations. (b) The stream network topology, with gauged locations highlighted in red.

It can get way more complicated...

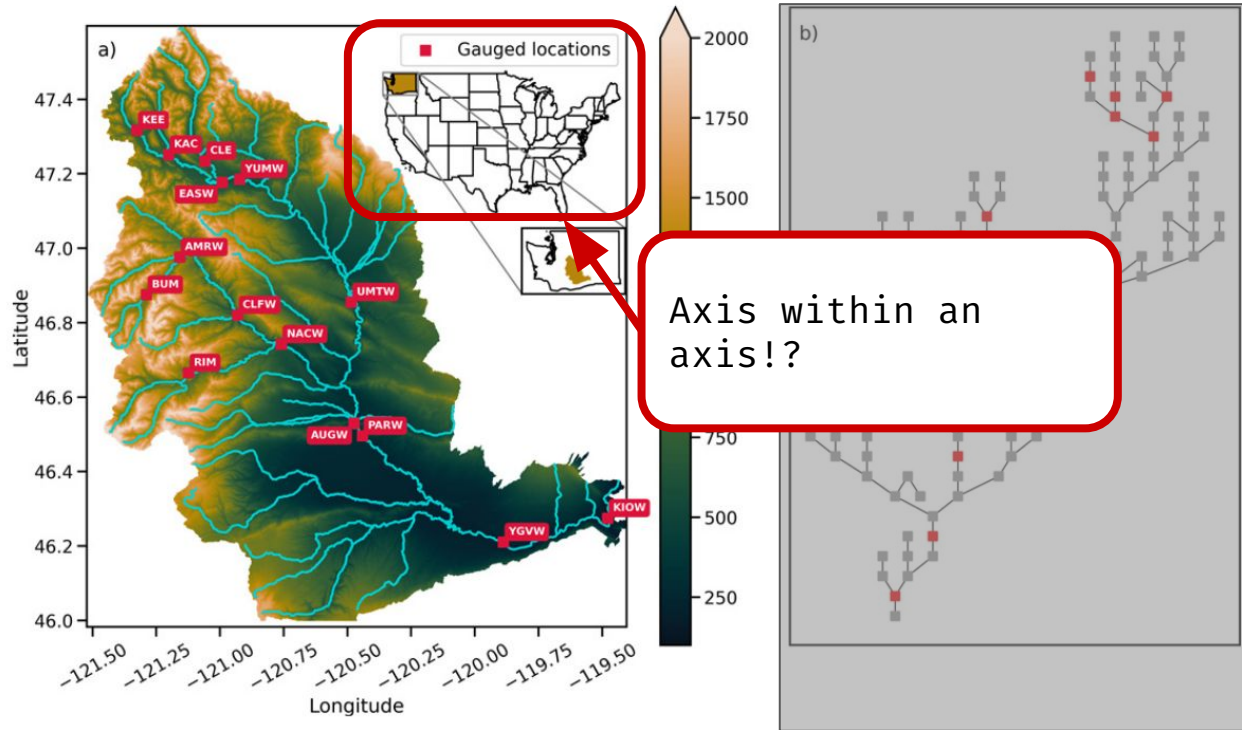


FIG. 2. (a) Yakima River basin map. Gauged sites are shown in red and are labeled with their stream gauge abbreviations. (b) The stream network topology, with gauged locations highlighted in red.

It can get way more complicated...

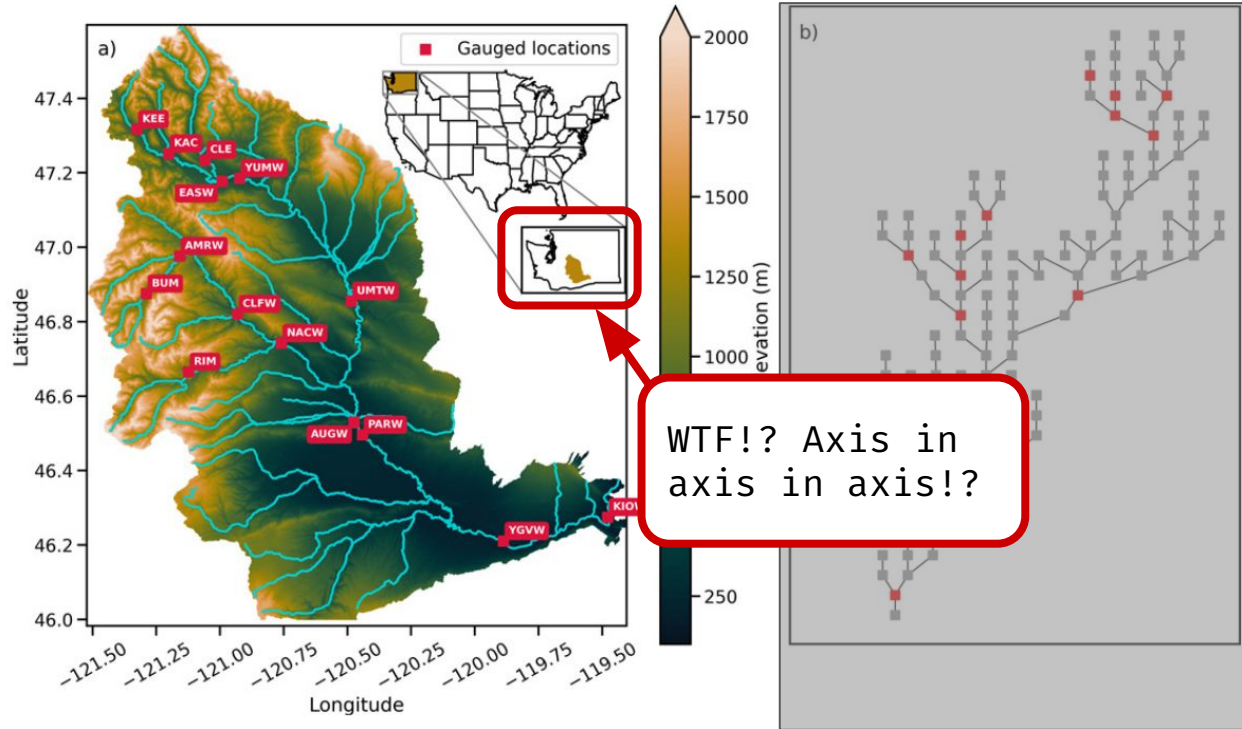


FIG. 2. (a) Yakima River basin map. Gauged sites are shown in red and are labeled with their stream gauge abbreviations. (b) The stream network topology, with gauged locations highlighted in red.

It can get way more complicated...

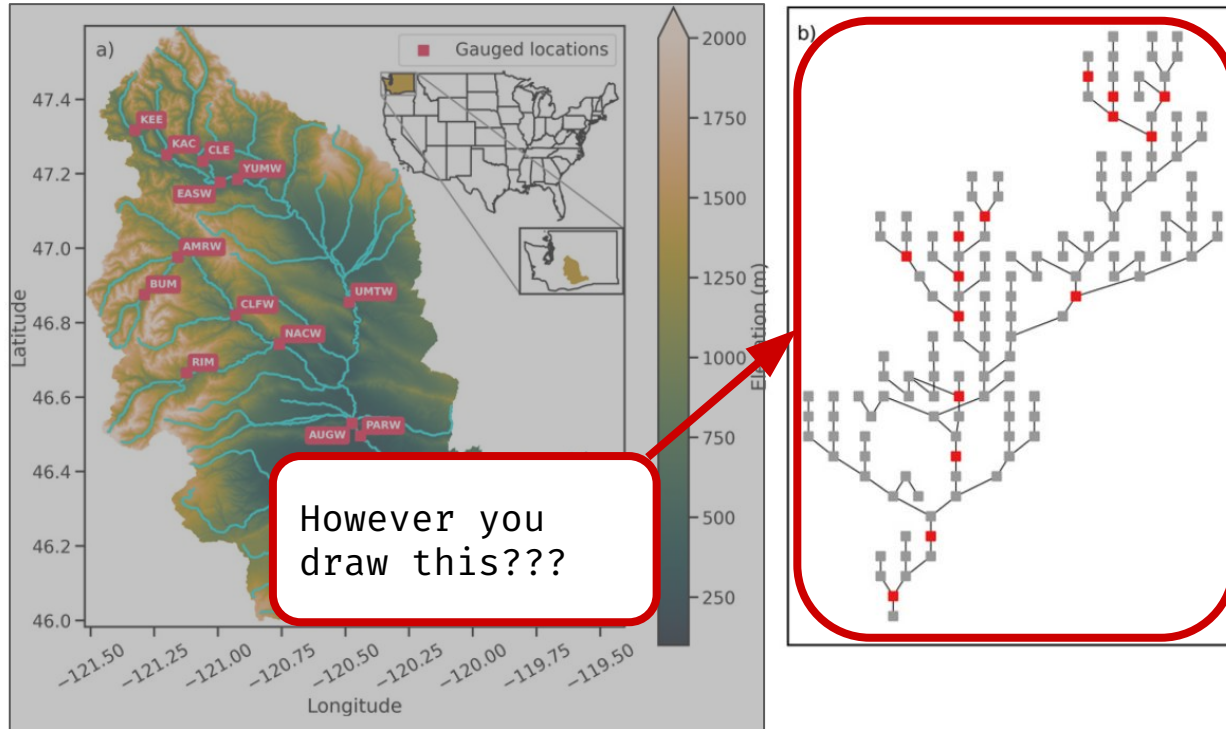


FIG. 2. (a) Yakima River basin map. Gauged sites are shown in red and are labeled with their stream gauge abbreviations. (b) The stream network topology, with gauged locations highlighted in red.

It can get way more complicated...

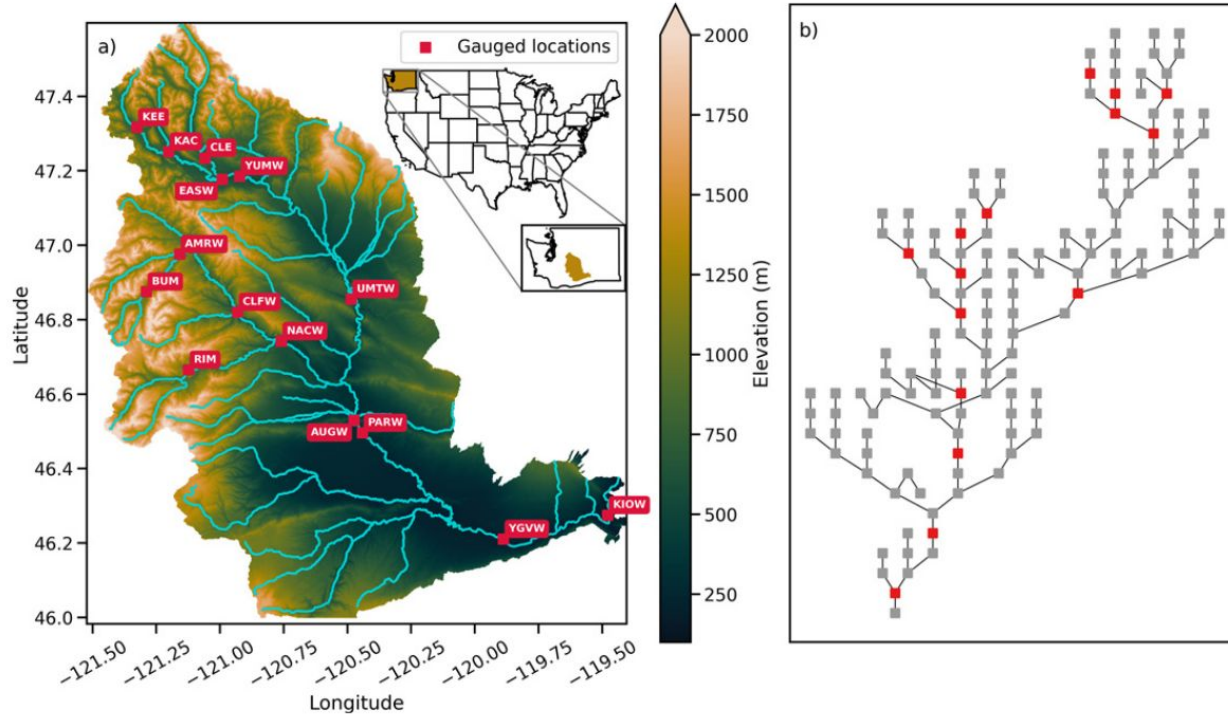
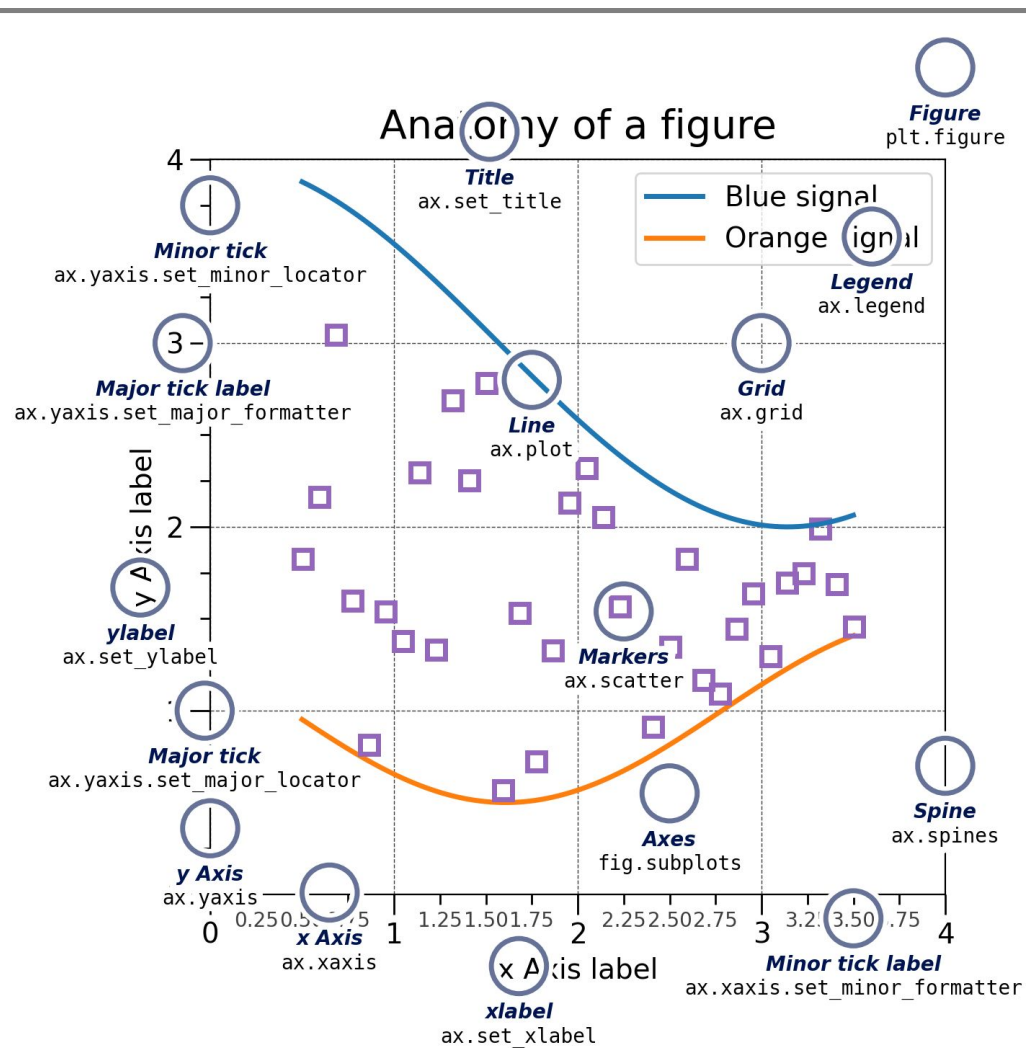


FIG. 2. (a) Yakima River basin map. Gauged sites are shown in red and are labeled with their stream gauge abbreviations. (b) The stream network topology, with gauged locations highlighted in red.

Anatomy of a matplotlib plot



**Let's jump to vscode
for some numpy
review + more
matplotlib**