GENERAL ASSEMBLY

DATA SCIENCE TOOLS

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LEARNING OBJECTIVES

- Identify the data science toolkit
- Navigate Git and the Command Line
- Describe Probability vs Odds

PRE-WORK

PRE-WORK REVIEW

- Explain the difference between *variance* and *bias*
- Use **descriptive stats** to understand your data

OPENING

DATA SCIENCE TOOLS

LET'S DISCUSS THE CURRENT LESSON OBEJCTIVES

- Identify the data science toolkit
- Navigate Git and the Command Line
- Describe Probability vs. Odds

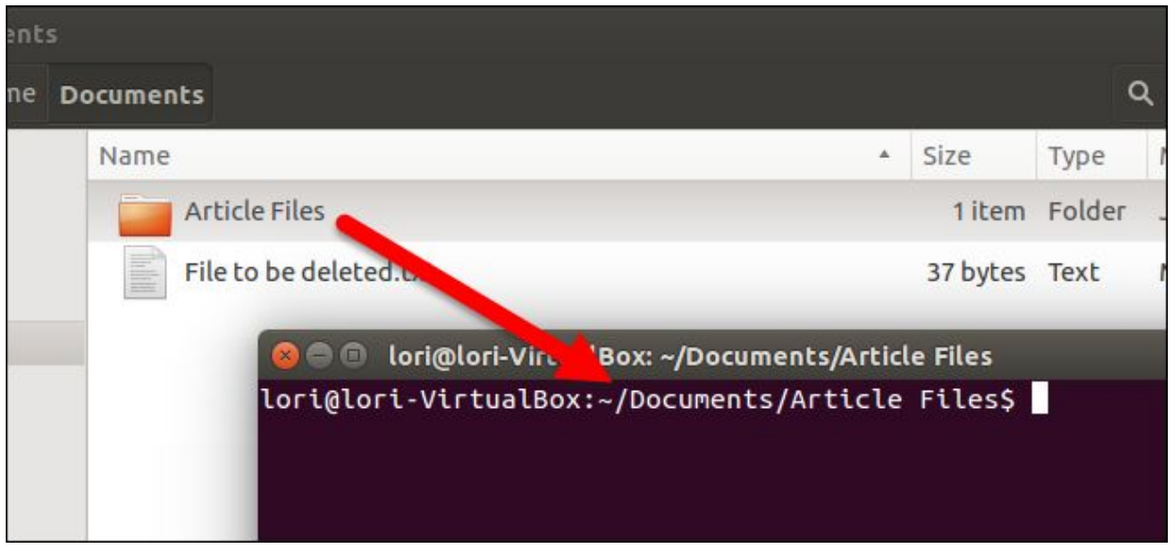
TOOLS OF THE TRADE

TOOLS OF THE TRADE

- Today we are going to review some of the tools we use in data science
- We'll see how they fit into the wider programming environment
- We'll start with the command line
  - This is your portal to your computer and the outside world

LOCAL MACHINE

- On your local computer, you have a variety of tools at your disposal
  - Text editor
  - Programs/tools
  - Your files



- All of these can be accessed through the terminal or through a GUI (Graphical User Interface)
- You can navigate your files through the terminal or through Finder

DATA SCIENCE TOOLS

Outside World

Local Machine

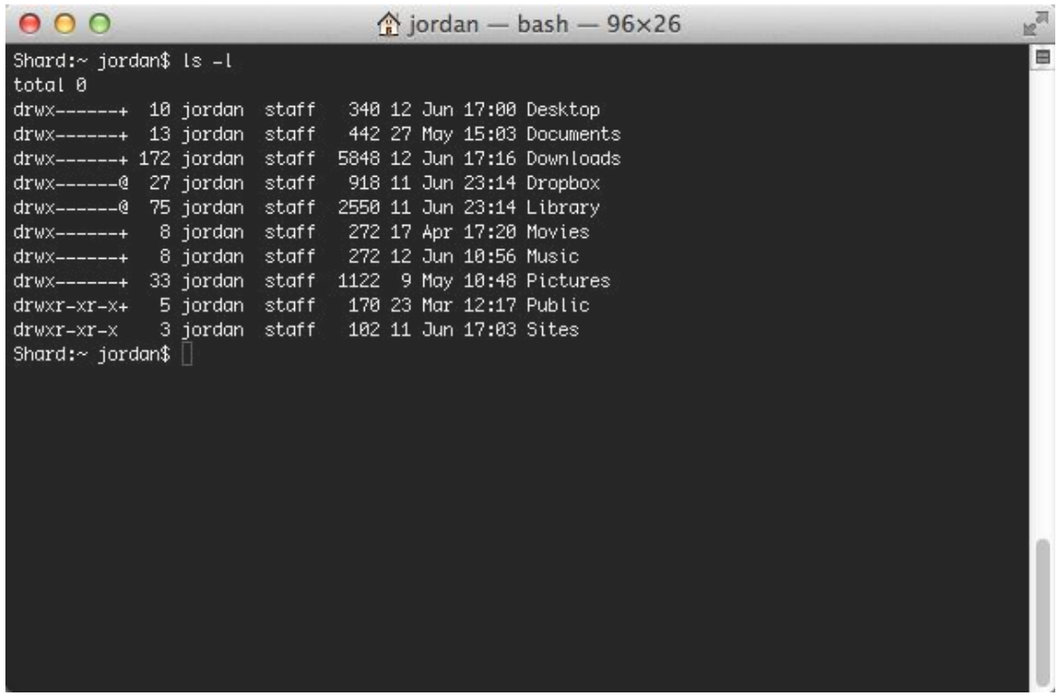
Terminal/
Command Line

DEMO

COMMAND LINE

COMMAND LINE

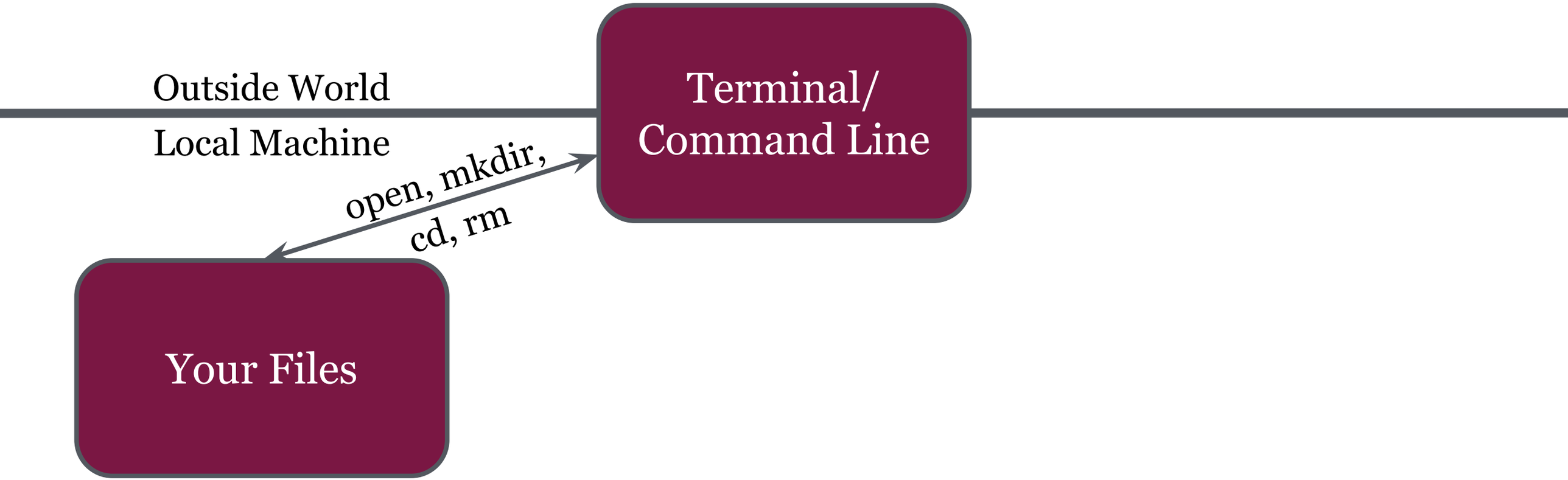
- Let's walk through a few commands
  - `cd`
  - `pwd`
  - `$home`
  - `mkdir`
  - `open`



We can access many tools with the terminal

- Let's walk through a few…

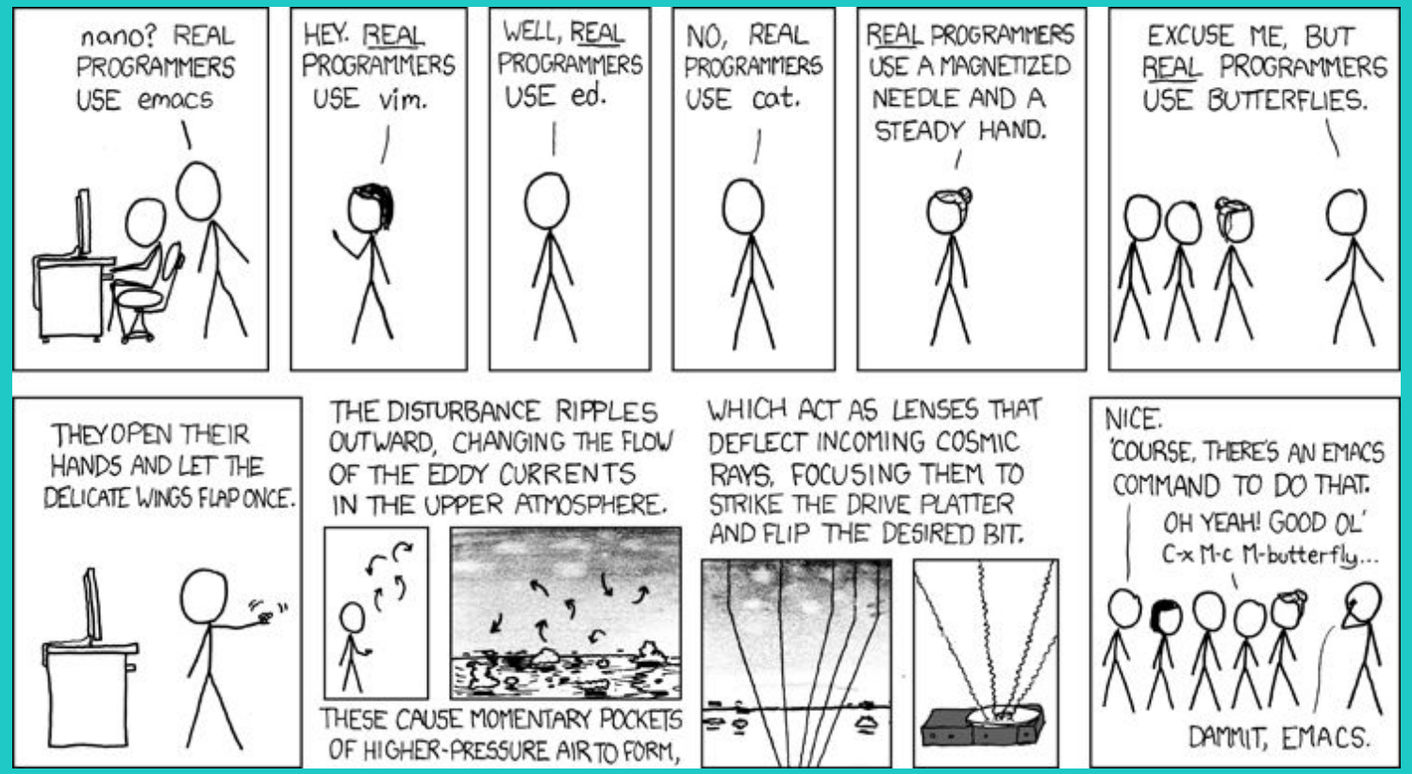
DATA SCIENCE TOOLS



TEXT EDITORS

INTRODUCTION

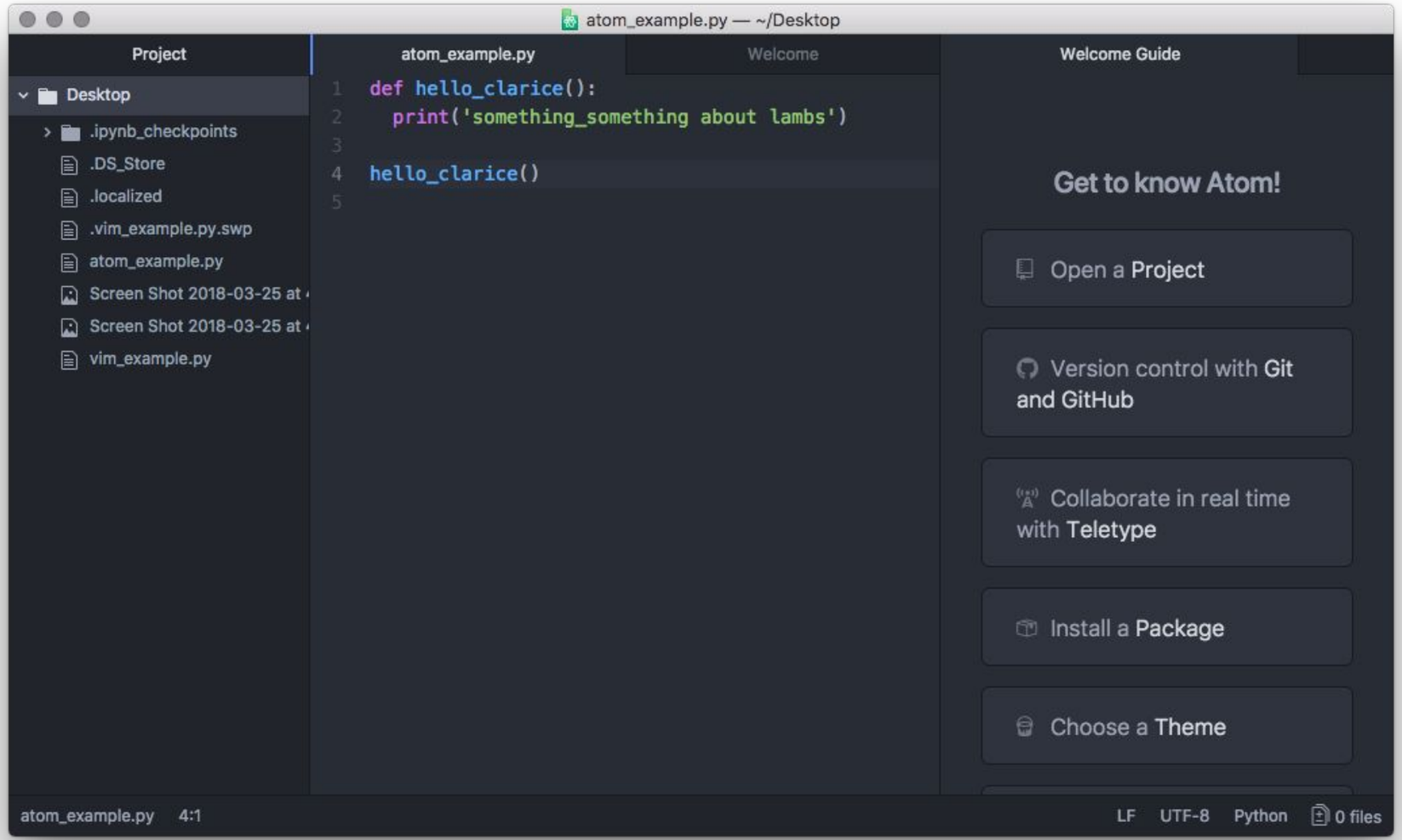
TEXT EDITORS



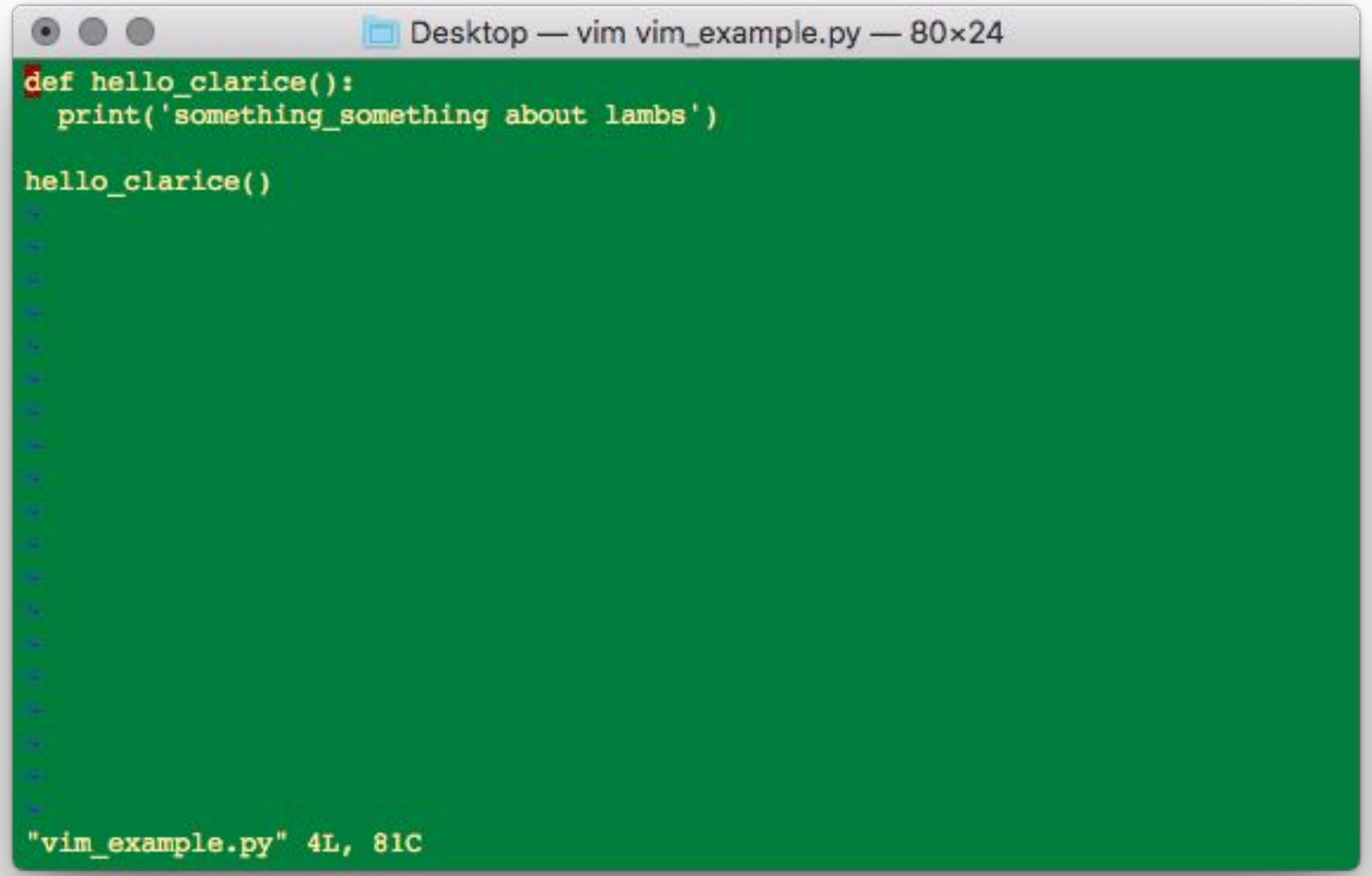
TEXT EDITORS

- So far, we've used iPython Notebooks in place of a text editor
- However, there are many options available
  - eMacs
  - Vim
  - Sublime Text
- Let's look at a few examples...

TEXT EDITORS



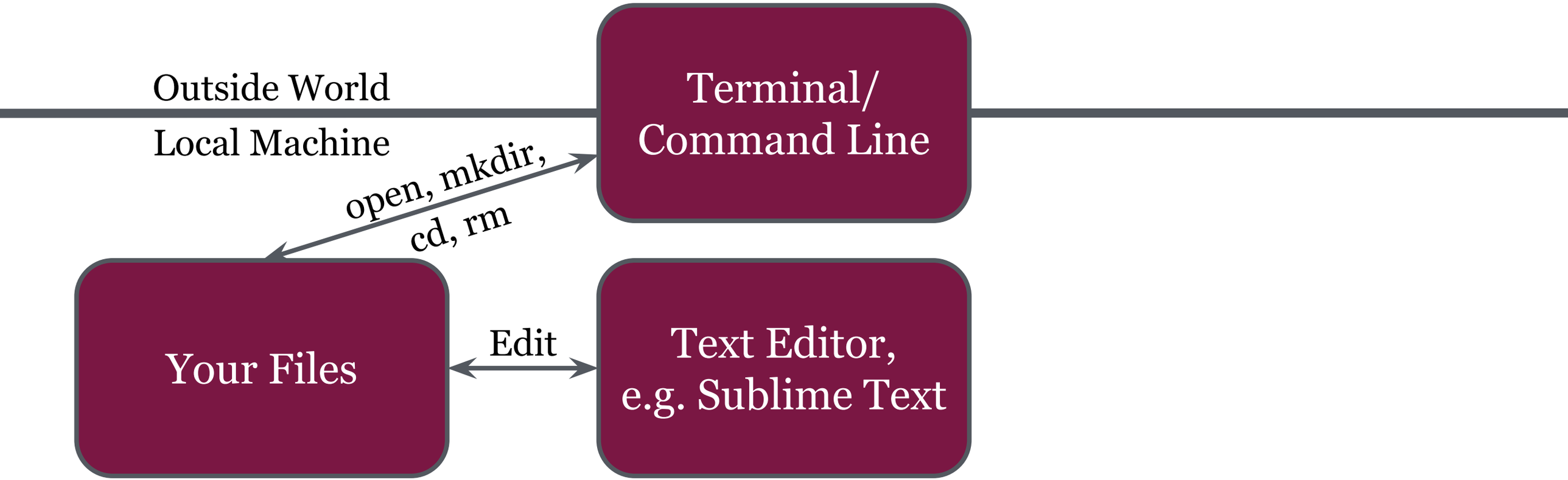
TEXT EDITORS



TEXT EDITORS

- Open “say-hi.py”, in the lesson-05 folder of the class repo, in a text editor

DATA SCIENCE TOOLS



ACTIVITY: KNOWLEDGE CHECK

EXERCISE

ANSWER THE FOLLOWING QUESTIONS

1. What is a text editor?
2. Can you name any other examples?

DELIVERABLE

Answers to the above questions

JUPYTER NOTEBOOK

JUPYTER NOTEBOOK

- Where does Jupyter Notebook fit in?
- The notebook combines the console, web apps, and markdown to capture the whole computation process
- Jupyter/iPython notebooks combine two components:

1. A web application
2. Notebook documents

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- Jupyter/iPython notebooks combine two components:
  - A web application
  - Notebook documents

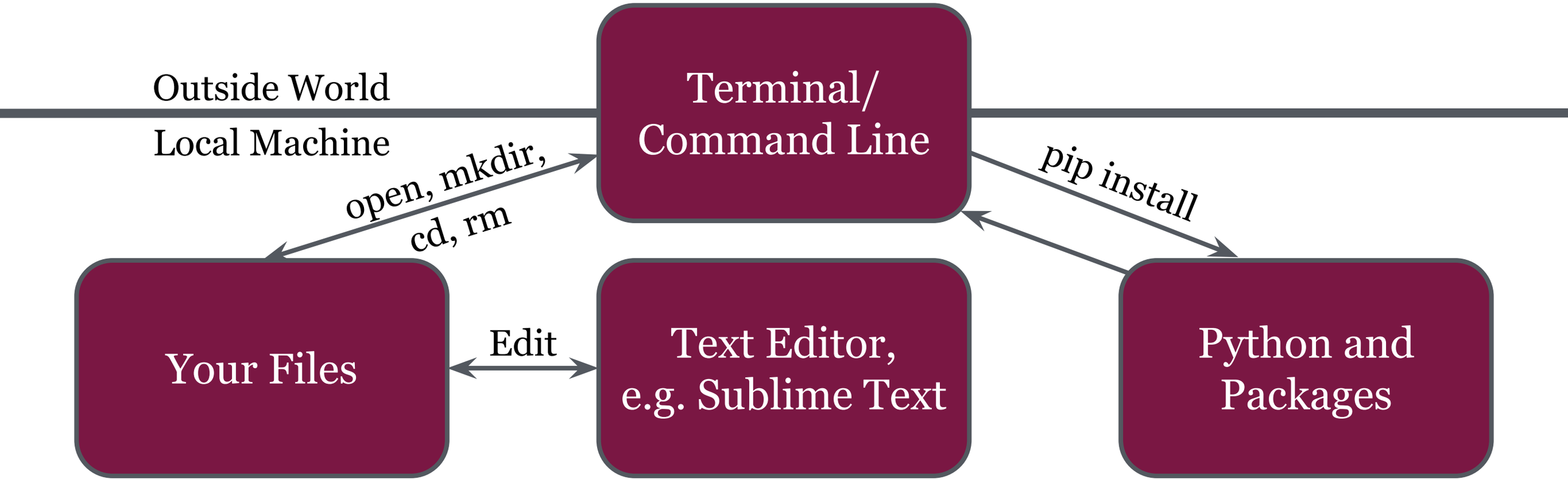
PYTHON PACKAGES

PYTHON PACKAGES

- The terminal allows us to run programs and reach out to the outside world
- We can add programs and packages as needed
- To add Python packages, we use a tool called *pip*
- Let's `pip install` a package with the command line
  - We'll install Beautiful Soup, a HTML/XML parsing package

```
pip install beautifulsoup4
```

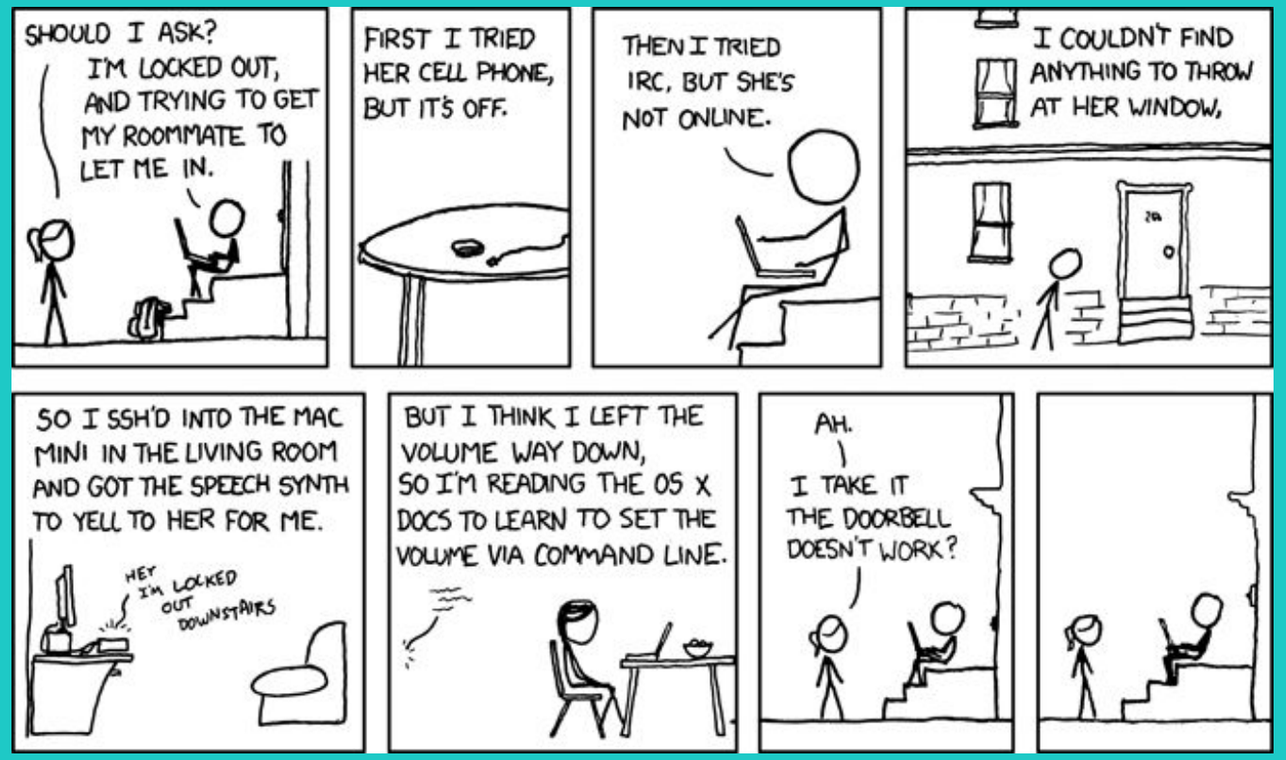
DATA SCIENCE TOOLS



THE OUTSIDE WORLD

INTRODUCTION

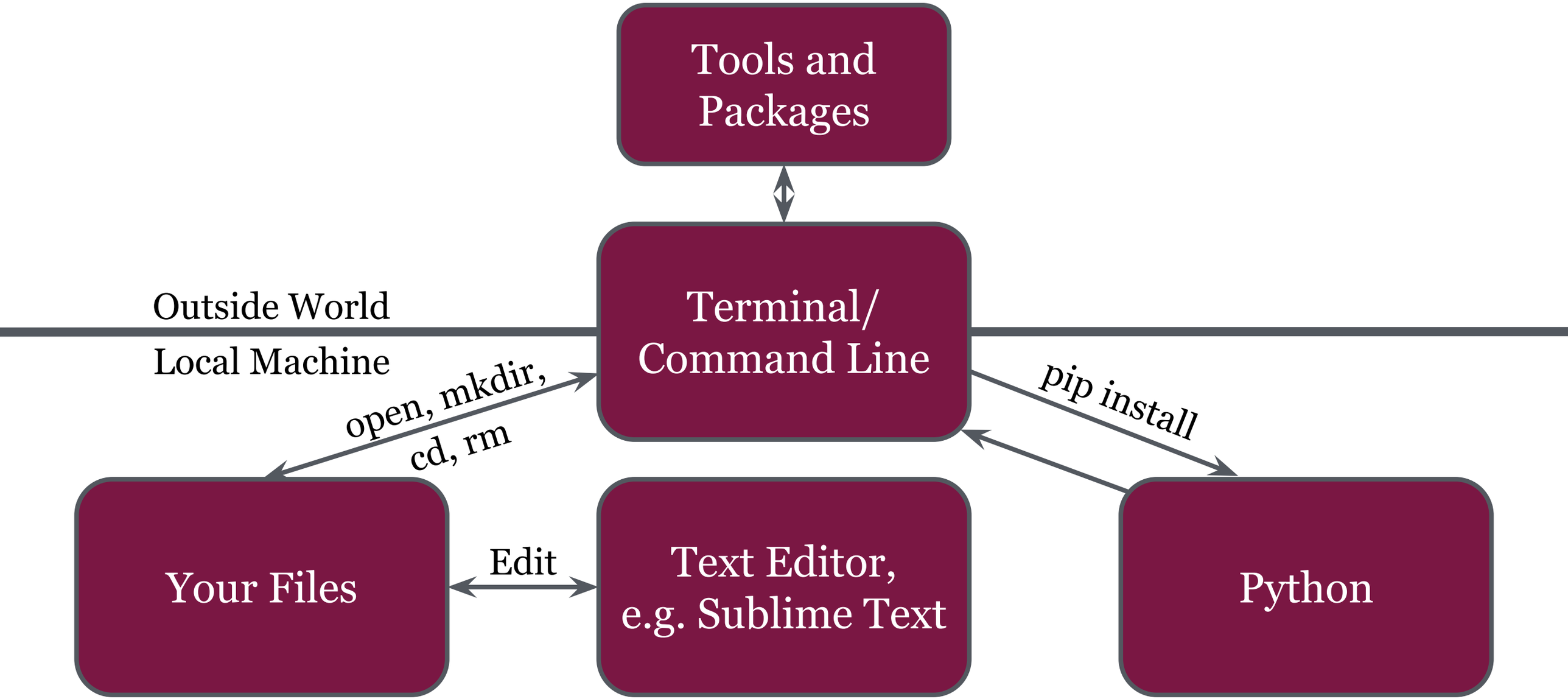
THE OUTSIDE WORLD



THE OUTSIDE WORLD

- The command line also allows you to download and use other tools and packages
- There are many tools for different purposes available in the outside world

DATA SCIENCE TOOLS



THE OUTSIDE WORLD

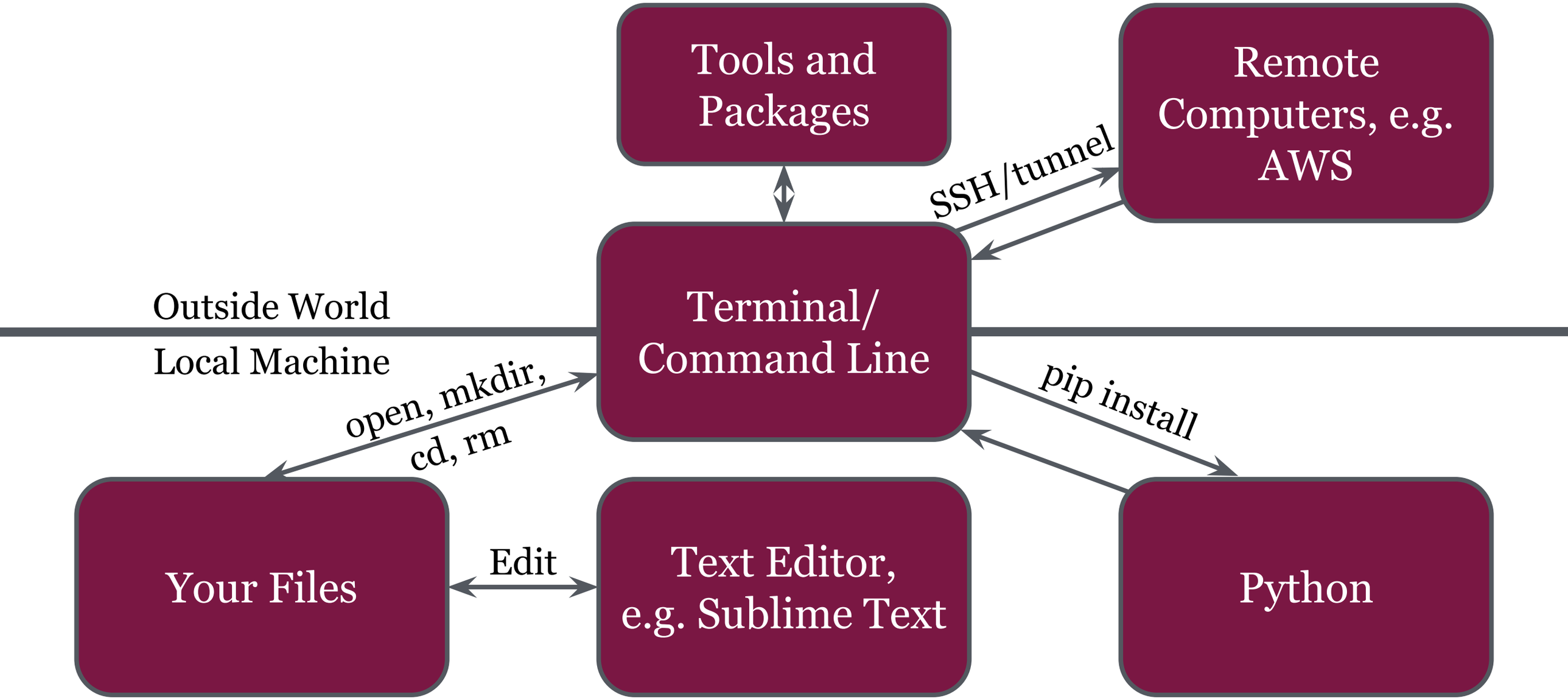
- As we saw with pip, the command line can connect us to the outside world
  - This becomes more important for data

- We may have HIPAA protected data
  - This means we can't leave this sensitive data on our *local* machine (i.e. laptop)

- We need to communicate with a *remote* machine (i.e. server) to access the data via command line

- Let's see a demo!

DATA SCIENCE TOOLS



GIT

INTRODUCTION

GIT

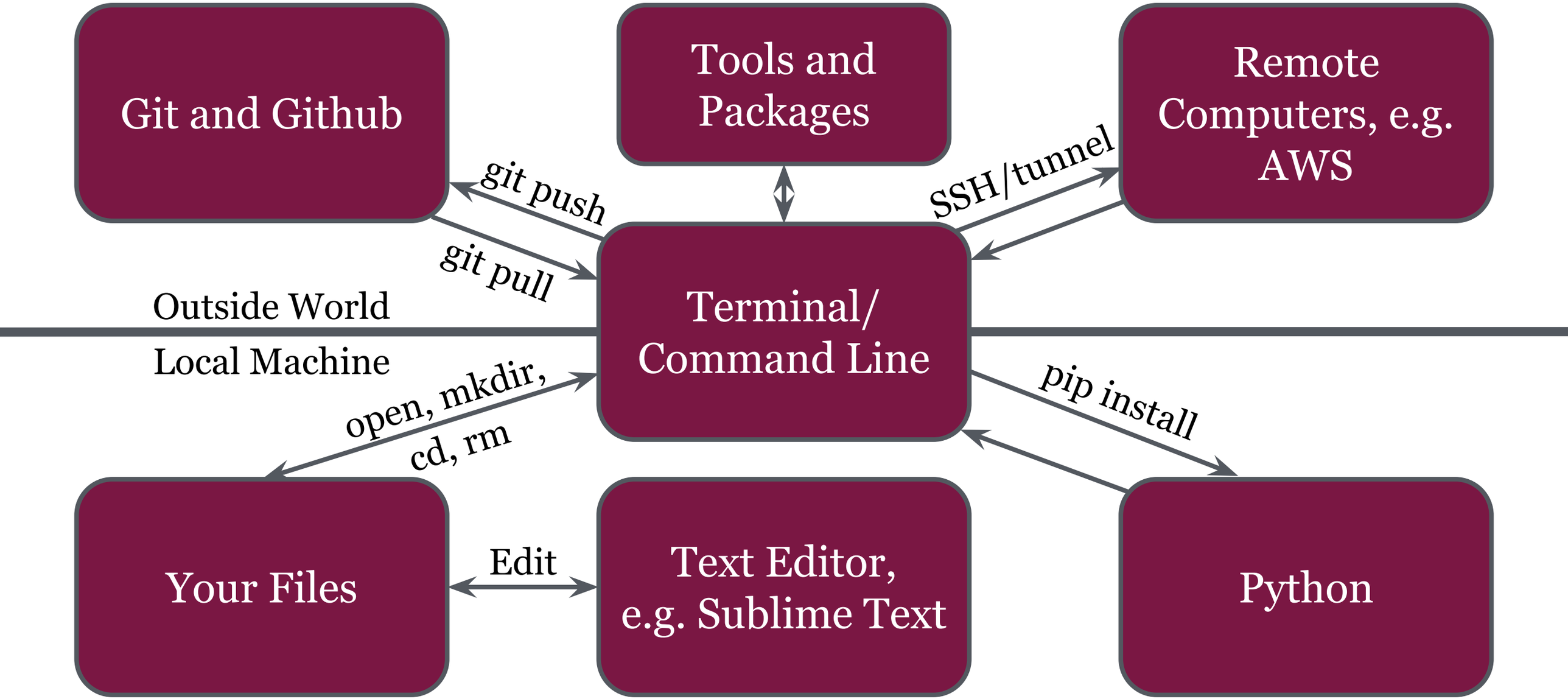
GIT

- Version control is necessary when working on complex projects
- Git is a way of tracking changes we've made to our programs that allows us to go back in time to fix errors
- Combined with Github, Git is a powerful tool for collaborating with colleagues
  - You can work on different aspects of projects simultaneously and merge the changes together seamlessly
- There are many different ways to use these tools

GIT

- Let's see an example of using Git and Github
- There are three primary commands we'll use
  - `git add`
  - `git commit`
  - `git push`
- When a colleague wants to implement our change, we may use the command `git pull`

DATA SCIENCE TOOLS



ACTIVITY: KNOWLEDGE CHECK

EXERCISE

ANSWER THE FOLLOWING QUESTIONS

1. What is a GUI?
2. What is the command line?
3. What are the big advantages of using the command line over a GUI?

DELIVERABLE

Answers to the above questions

GUIDED PRACTICE

GIT AND COMMAND LINE

ACTIVITY: GIT AND COMMAND LINE

EXERCISE

DIRECTIONS (20 minutes)

1. Review the exercises from **try.github.io**
2. Are there any questions?

DELIVERABLE

Questions

GUIDED PRACTICE

ODDS AND PROBABILITY

ACTIVITY: ODDS & PROBABILITY

EXERCISE

DIRECTIONS (20 minutes)

Some of you may already be familiar with odds and probability.

1. We will use the starter code in lesson-05 of the class repo to review the concepts of odds and probability.

DELIVERABLE

Answer the questions in the notebook

TOPIC REVIEW

REVIEW

- What are some common data science tools?
- Why are these tools useful?
- Any other questions?

UPCOMING WORK

BEFORE NEXT CLASS

DUE DATE

- Final Project Pt. 1: Thurs (4/12)

LESSON

Q & A

EXIT TICKET

DON’T FORGET TO FILL OUT YOUR EXIT TICKET