MY470 Computer Programming

Anaconda, Jupyter, and GitHub

Week 1 Lab, MT 2017

IDEs

- Integrated development environment
- A software application that facilitates computer programming and software development
  - Text editor with syntax highlighting, auto completion and smart identation
  - Shell with syntax highlighting
  - Popular libraries
  - (Debugger)

Anaconda

- Freemium open-source cross-platform distribution of the Pyhton and R programming languages
  - *conda* – package management system
  - *git*, *pandas*, *scikit-learn*, *nltk*, etc. – packages for data science
  - Anaconda Navigator – graphical user interface
  - Jupyter Notebook – web app for creating and sharing code

Installing Anaconda

- Go to https://www.continuum.io/downloads (https://www.continuum.io/downloads)
- Select your OS
- **Download Python 3.6 version**
- Follow instructions

Jupyter

- Open-source web application for creating and sharing documents with:
  - Live code
  - Equations
  - Visualizations
  - Explanatory text
- Supports more than 40 programming languages, including Python and R
- Notebook files have *.ipynb* extension and can be easily shared, e.g. on GitHub

Launching Jupyter

- Launch Anaconda Navigator and click on Jupyter Notebook icon

or

- Open Terminal/cmd and type:

```
> jupyter notebook
```

Using Jupyter

- New → Notebook: Python 3
- Insert → Insert Cell Below
- Cell → Cell Type →
  - Markdown
    - MY 473/573 Managing and Visualizing Data
    - Cheatsheets, for example: https://github.com/adam-p/markdown-here/wiki/Markdown-Cheatsheet (https://github.com/adam-p/markdown-here/wiki/Markdown-Cheatsheet)
  - Code

The `print` Function in Python

In [1]:
```
print('The')
print('The', 'winning', 'number', 'is', 7, '.')
print('The winning number is '+ str(7) + '.')
```

```
The
The winning number is 7 .
The winning number is 7.
```

Using Jupyter for Slides

- Install RISE

```
> conda install -c damianavila82 rise
```

- Restart Jupyter
- View → Cell Toolbar → Slideshow to determine slideshow flow
- Click on Enter/Exit Live Reveal Slideshow

Shutting Down Jupyter

- Do not forget to Command+S / CTRL+S !
- Jupyter is a server and closing the browser window will not shut it down
- To shut down:
  - File → Close and Halt
  - Notebook Dashboard → Slect notebook → Shutdown
  - Terminal → CTRL+C → `y`

Alternative Python Workflow

- Use another IDE

or

- Use text editor (e.g. Atom) to create .py files
- Run files in Terminal/cmd

```
> cd Path/to/file
> python filename.py
```

GitHub

- Code hosting platform for version control and collaboration
- Based on Git
  - Version control system for tracking changes in computer files and coordinating work on those files among multiple people
  - Created in 2005 by Linus Torvalds
- Largest host of source code in the world

GitHub Lingo

- Repository – a space for a project/assignment
- Clone – a copy of the repository that lives on your computer
- Branch – a paralel version of the repository
- Commit – save changes with a short description
- Pull request – ask changes to be merged
- Merge – incorporate changes (then delete branch)

Getting Started with GitHub

- Create personal account on GitHub
- Go to https://education.github.com/ (https://education.github.com/) and get the Student Developer Pack for some cool freebies

- Syllabus and lectures can be found at http://github.com/lse-my470/lectures (http://github.com/lse-my470/lectures)
    - View them online or even better, download/clone them and use Jupyter to annotate them

- E-mails with links to assignments will be sent in due course
    - Answers to assignments will be available at https://github.com/lse-my470/answers-to-assignments (https://github.com/lse-my470/answers-to-assignments)

Submitting Assignments on GitHub (Web Version)

1. Accept invitation to assignment. This will automatically create a new repository with your username.
2. **Clone/download** the repository (GitHub web interface)
3. Make changes in downloaded files and/or create new files (Jupyter)
4. Upload and **commit** new and/or changed files **directly to the master branch**. Do this before the deadline (GitHub web interface)
5. We will automatically download all assignment repositories when the deadline has passed. We will then comment and mark your assignment directly in the main file you submitted
6. Wait for a new commit from us to view our feedback (GitHub web interface)

*Cloning and Updating Lectures from GitHub (Terminal Version)

Cloning

```
> cd Path/to/directory

> git clone https://github.com/lse-my470/lectures.git
```

Updating

```
> cd Path/to/lectures

> git pull
```

*Submitting Assignments on GitHub (Terminal Version)

1. Accept invitation to assignment. This will automatically create a new repository with your username.

2. **Clone** the repository (Terminal)

   ```
   > cd Path/to/directory

   > git clone link.git
   ```

   (You can obtain the link when you click the "Clone or download" button on the GitHub page for the repository.)

3. Make changes in downloaded files and/or create new files (Jupyter)

4. **Commit** new and/or changed files and **push to the master branch**. Do this before the deadline (Terminal)

   ```
   > cd Path/to/directory

   > git add *

   > git commit –m 'Submitting assignment'

   > git push
   ```

5. We will automatically download all assignment repositories when the deadline has passed. We will then comment and mark your assignment directly in the main file you submitted

6. **Pull** the new version we commit to view our feedback (Terminal)

```
> cd Path/to/directory

> git pull
```

Resources

- Python documentation (http://docs.python.org/3/)
- Python Wikibook (https://en.wikibooks.org/wiki/Python_Programming)
- Google
- Stack Overflow (https://stackoverflow.com/)

Give credit when copying code or solutions!

Week 1 Assignment

- Write a simple program in a Jupyter notebook and submit it on GitHub
- E-mail with link to assignment will be sent by end of today