AI Boot Camp

Overview of Machine Learning Tools

Module 1 Day 3

Class Objectives

By the end of class, you will be able to:

1. Articulate real-world applications of AI and the benefits it provides.
2. Add files to GitHub from the command line.
3. Craft and evaluate good project documentation.
4. Set up a virtual environment with Anaconda.

Instructor **Demonstration**

AI Interactions

How do we **interact with AI** on a daily basis?

Time’s up!

Let’s review

Instructor **Demonstration**

The Impact of AI

Let’s Explore Some Ways That AI is Impacting Different Areas of Life

1. Finance
2. Business
3. Medicine
4. Daily life

AI and Finance

1. **Financial Advising**
   - AI-generated portfolios and portfolio management
   - Benefits:
     - Customers no longer have to pay high annual fees to traditional advisors.

2. **Forecasting Market Results**
   - Loan evaluation
   - High-frequency algorithmic trading in the stock market...now ~80% of trades

3. **Customer Service**
   - Predicts customer churn in financial products
   - Predicts startup success for venture capital

AI and Business

1. **Chatbots**
   - Evaluates customer queries
   - Provides personalized feedback that resembles human interaction
   - Benefits:
     - Available 24/7
     - Frees up human customer service representatives to handle more complex inquiries

2. **Manufacturing**
   - Sensors feed data into the algorithm
   - Benefits:
     - Provides constant, reliable, real-time updates
     - Reduces human error
     - Increases efficiency

3. **Programming (GitHub Copilot): https://github.com/features/copilot**
   - Suggests code to programmers like predictive text in text messages or email
   - Benefits:
     - Increases efficiency

AI and Medicine

1

- **Medical Assistants**
  - NLP generates a text transcript of conversations between doctors and patients.
  - Benefits:
    - Reduces administrative load on doctors so they can spend more time with patients
    - Reduces the risk of human error

2

- **Pharmacology and Drug Research**
  - Streamlines medical research
  - Benefits:
    - Increases efficiency, which can save lives
    - Reduces cost of drug development

3

- **Genomics**
  - Deep learning sequences human genomes
  - Benefits:
    - Increases efficiency
    - Reduces costs, allowing for greater access

AI in our Daily Lives

1

- **Generative AI**
  - Large language models train transformer models to generate new, naturalistic material based on its training data.
  - Text
  - Code
  - Images
  - Music
  - Genetic sequencing

2

- **Virtual Assistants**
  - Chatbots with conversational features

3

- **Self-driving Cars**
  - Combines cameras, sensors, and algorithmic data to navigate without a human operator

Instructor **Demonstration**

AI Foundations

AI Foundations

Today we will cover:

1. Installing Anaconda
2. Creating virtual environments

Activity:
Terminal Refresher

In this activity you will do some work in the terminal.

You'll create three folders and add an .md file to each folder.

Suggested Time:
10 Minutes

Time’s up!

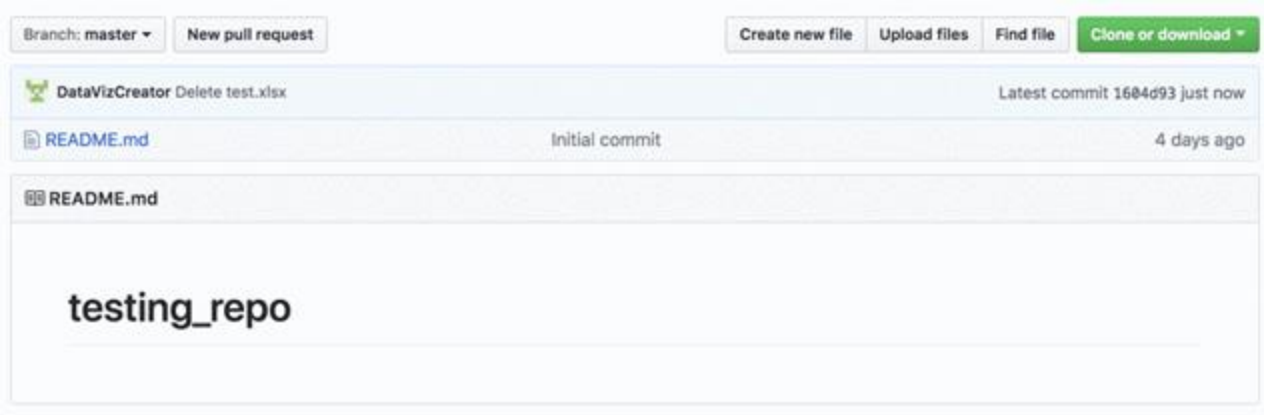
Let’s review

Instructor **Demonstration**

Adding Files from the Command Line

Activity:
Adding Files from the Command Line

Create a new repo. From the repo page, click the green box in the top-right labeled “Clone or download”, select “Use SSH” and copy the link to the clipboard, as captured in the following GIF:



Suggested Time:
25 Minutes

Activity:
Adding Files from the Command Line

Open Terminal (or Git Bash for Windows users) and navigate to the home folder using cd ~.

Type `git clone <repository link>` in the terminal to clone the repo to the current directory. Once this code has run, everyone should find a folder with the same name as the repo:

```
$ git clone git@github.com:DataVizCreator/testing_repo.git
```

Open the folder in VS Code and create two python script files, named `script01.py` and `script02.py`.

Suggested Time:
25 Minutes

Activity:
Adding Files from the Command Line

Then, open Terminal/Git Bash and navigate to the repo folder. Run the following lines:

```
# Displays that status of files in the folder
git status
# Adds all the files into a staging area
git add .
# Check that the files were added correctly
git status
# Commits all the files to your repo and adds a message
git commit -m <add commit message here>
# Pushes the changes up to GitHub
git push origin main
```

Navigate to the repo on Github.com to confirm that the changes have been pushed up.

Suggested Time:
25 Minutes

Break

15 mins

Instructor **Demonstration**

Documentation

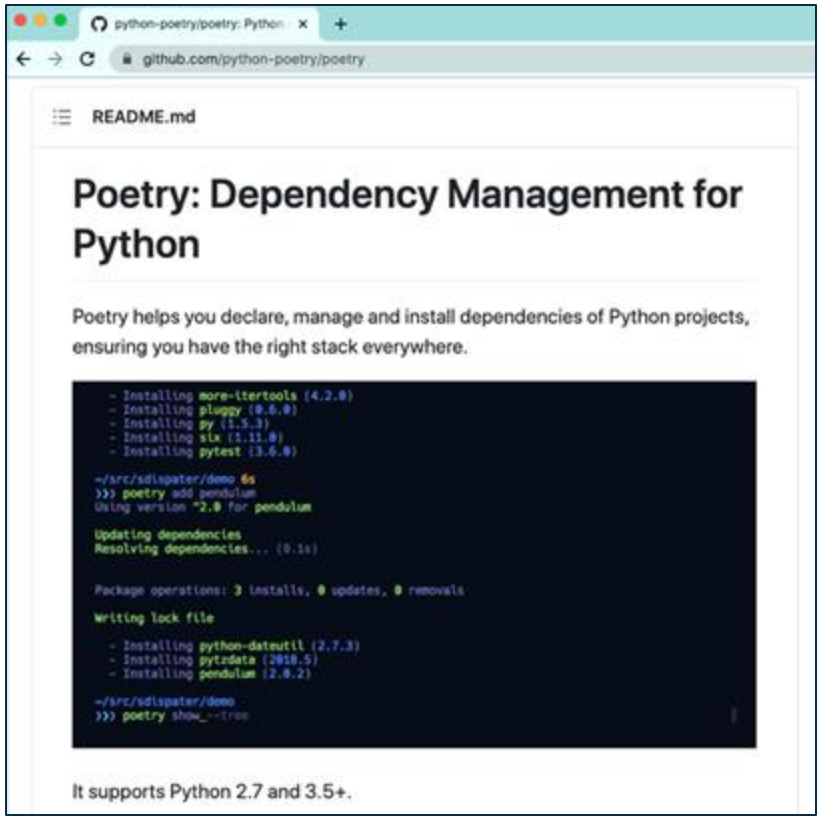
What Makes Proper Documentation?

1. The structures of an application
2. The functions of an application
3. The inputs and outputs of the functions
4. The number of required parameters
5. The data types of the parameters
6. Required dependencies of the application

1. Examples/screenshots of code snippets
2. Information about deployment and implementation

README.md

- GitHub standard
- Introduces the project
- Contains information about the other files in a directory
- Uses **Markdown** markup language
    - Plain-text syntax for formatting text for display online



Markdown Syntax

1. One, two, or three number signs (#, ##, or ###) to specify a heading at Level 1, Level 2, or Level 3, respectively
2. One or two asterisks (* or **) to specify text that's *italic* or bold, respectively
3. Three hyphens (---) to specify a horizontal rule
4. A right angle bracket (>) to specify a block quote
5. One or three backticks (`` `` or ```) to specify a snippet or a code block, respectively.

Markdown Syntax Continued

6. Brackets and parentheses (`[<text>](<link>)`) to indicate a hyperlink. The brackets enclose the hyperlink text. The parentheses enclose the webpage URL.

7. An exclamation point, brackets, and parentheses (`![<alt text>](<url>)`) to specify an image. The brackets enclose the alternative text, or alt text for the image. The parentheses enclose the file path of the image relative to that of the Markdown file.

Activity:
Explore README.md Files

Identify elements of effective README.md files.

Suggested Time:
15 Minutes

Time’s up!

Let’s review

Instructor **Demonstration**

Install Anaconda

Check your Anaconda installation

1. Open the terminal and run `conda init bash` or `conda init zsh` depending on your operating system. Restart your terminal.

2. Run `conda --version` and press Enter.

3. The terminal output should return `conda 23.x.x`.

Instructor **Demonstration**

Create a Virtual Environment

Create a Virtual Environment

What is a virtual environment?

- Virtual environments create an isolated environment for Python projects.
- You may work on different projects that have different dependencies.
- Different projects might also use different types and versions of libraries.
- This virtual environment ensures you have the required dependencies for future class activities.

Let’s **recap**

Recap

After today's lesson you are able to:

1. Articulate real-world applications of AI and the benefits it provides.
2. Add files to GitHub from the command line.
3. Craft and evaluate good project documentation.
4. Set up a virtual environment.

Challenge

In this Challenge, you'll practice using the AI foundational skills you have learned in this module to research reports, publications, and online resources that AI professionals use to evaluate the industry.

Homework Questions?

Questions?

The End