

PYTHON BASICS

Read the Python (and Arduino) installation procedure available at the workshop's website:

http://www2.sunysuffolk.edu/denicog/python_workshop.html

The software will be installed for you in our SCCC laptops during the workshop. But if you want to explore more outside the workshop, you will want to install these **free** packages in your personal computer at home.

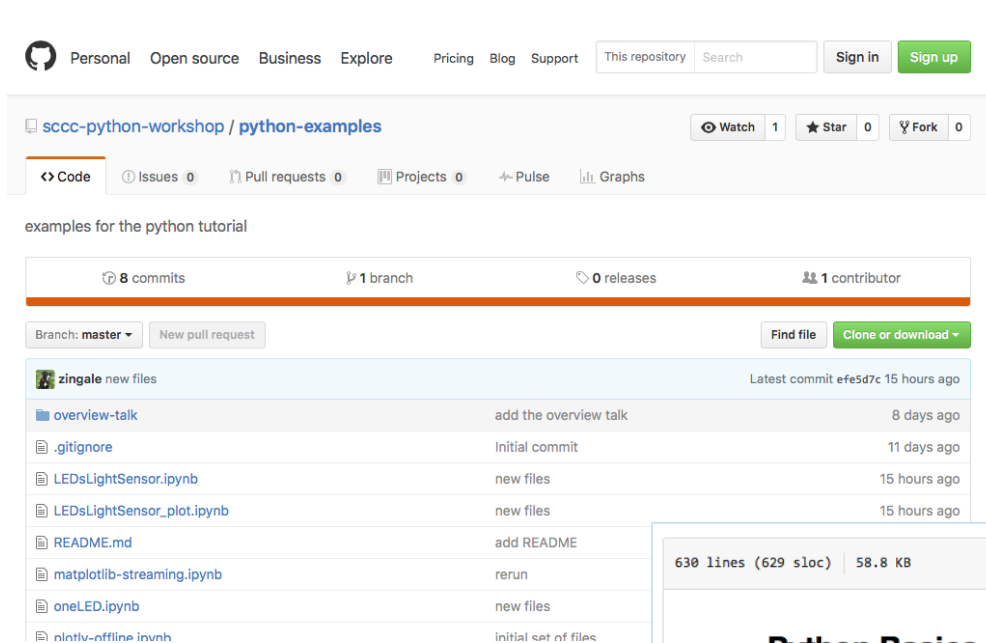
Explore the links at the workshop website. You can learn more about Python, Arduino, circuits, etc from those links.

All electronic components and Arduinos for this workshop were purchase from www.sparkfun.com. You will use the material for free during the workshop, but cannot take them home at the end.

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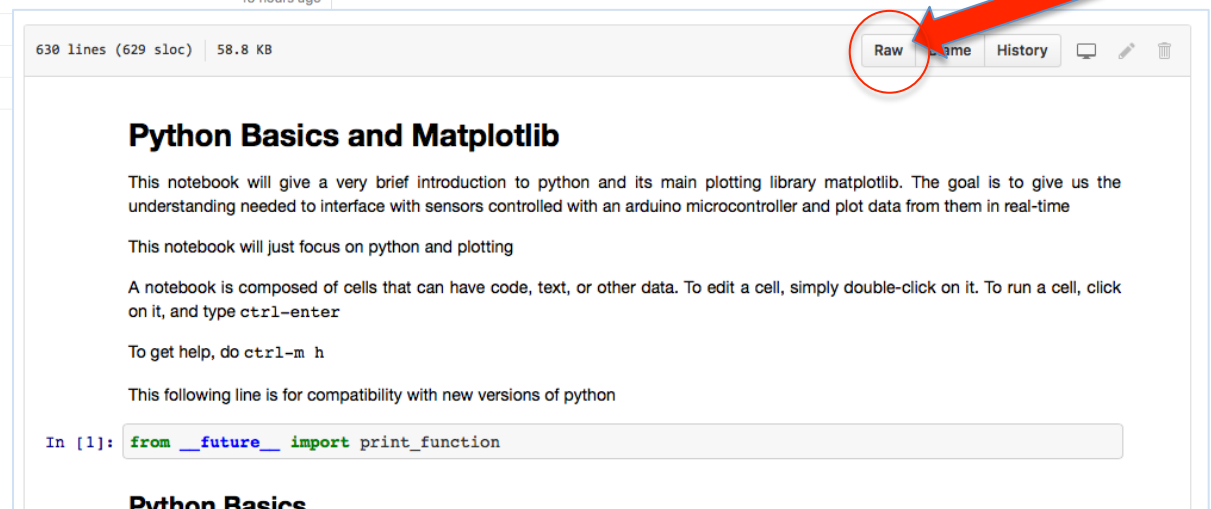
All Python codes used in this workshop are available at

<https://github.com/sccc-python-workshop/python-examples>



The screenshot shows the GitHub repository page for 'python-examples' under the 'sccc-python-workshop' organization. The page includes navigation links like 'Personal', 'Open source', 'Business', 'Explore', 'Pricing', 'Blog', and 'Support'. It also features a search bar, 'Sign in', and 'Sign up' buttons. The repository name 'python-examples' is displayed, along with 'Watch', 'Star', and 'Fork' buttons. Below this, there are tabs for 'Code', 'Issues', 'Pull requests', 'Projects', 'Pulse', and 'Graphs'. The 'Code' tab is selected, showing a list of files and folders. The files include 'overview-talk', '.gitignore', 'LEDsLightSensor.ipynb', 'LEDsLightSensor_plot.ipynb', 'README.md', 'matplotlib-streaming.ipynb', 'oneLED.ipynb', and 'nintv-offline.ipynb'. The 'overview-talk' folder is expanded, showing its contents. A blue arrow points from the URL above to the repository name.

To copy a code, open by clicking on the name. Once opened, click on Raw.



The screenshot shows the 'Raw' view of a Python notebook file named 'Python Basics and Matplotlib'. The file is 630 lines long, 629 source lines, and 58.8 KB. The content of the notebook includes an introduction to Python and Matplotlib, instructions on how to run a cell, and a code cell with the following code:

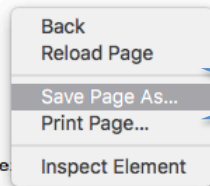
```
In [1]: from __future__ import print_function
```

A red arrow points to the 'Raw' button in the top right corner of the file view.

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This is the Raw version of the Python code. Click with the right button of your mouse to save as a file. IMPORTANT: when selecting a name to save, it must end in ***.ipynb**, and NOT *.txt. Make sure it is not ending as *.txt, otherwise it will never open for you.

```
{
  "cells": [
    {
      "cell_type": "markdown",
      "metadata": {},
      "source": [
        "# Python Basics and Matplotlib"
      ]
    },
    {
      "cell_type": "markdown",
      "metadata": {},
      "source": [
        "This notebook will give a very brief introduction to python and its main plotting library needed to interface with sensors controlled with an arduino microcontroller and plot data f\n",
        "\n",
        "This notebook will just focus on python and plotting\n",
        "\n",
        "A notebook is composed of cells that can have code, text, or other data. To edit a cell, click on it, and type `ctrl-enter`\n",
        "\n",
        "To get help, do `ctrl-m h`"
      ]
    },
    {
      "cell_type": "code",
      "execution_count": 1,
      "metadata": {
        "collapsed": true
      },
      "outputs": [],
      "source": [
        "from __future__ import print_function"
      ]
    }
  ]
}
```



Save with the same name: do not let your computer add *.txt at the end.

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We will be using python notebooks to learn and run the codes. You can read more about the advantages of notebook here:

<https://ipython.org/ipython-doc/3/notebook/>

To open a notebook – after you have completed the installation steps presented at the workshop website, you must:

1. Open a **command terminal** on Windows: this is done by typing **cmd** on the prompt of the computer (on Windows, go to the start button, and write **cmd**).
2. In the terminal, type **jupyter notebook**
3. Wait...and an **internet browser** should pop open (e.g., Windows Explorer, for Windows users). If more than one tab is open, click on the tab that shows directories and files: that's your python notebook. If you **saved a *.ipynb code to your desktop**, then click on Desktop, search of the code, and you will see it opening in the notebook.
4. To **run a code** (or just onecell of a code, if split into several cells) in the notebook, press **shift+enter**.

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During the first day, we will go over the code

matplotlib-streaming.ipynb

and learn some python basics explained in there. Ultimately, we will produce a plot, similar to the way that will be used to produce real-time plot of sensor signals.