# Teach Kids Coding

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# Chapter 1

# Setup

For parents.

## 1.1 Python

Python is a programing language. It is pre-installed in Mac, you don't have to install it if you are using a Mac.

Install Python 2.7.13

https://www.python.org/downloads/

## 1.2 GitHub

GitHub is use to share the code with other developers.

Register on GitHub

https://github.com/

Install GitHub client

https://desktop.github.com/

## 1.3 PyCharm

You can program purely use text editor. But an Integrated Development Environment (IDE) will make life much easier.

We use PyCharm

https://www.jetbrains.com/pycharm/

## 1.4 matplotlib

There are a lot of very useful packages (tool boxes) available for python. `matplotlib` is one for 2D plotting. We will use it to draw our maze in the final project.

For information, http://matplotlib.org/

To install

In PyCharm. File -> Default Settings -> Project Interpreter.

Chose the right python you installed from the Project Interpreter drop down box.

The installed packages will be displayed. Click the + sign, search `matplotlib`, then install.

Or

Open a Command Prompt in windows or Terminal in Mac then type:

```
python -m pip install -U pip setuptools
```

```
python -m pip install matplotlib
```

## 1.5 Test

Go to https://github.com/artcheng/TeachKidsCoding

Download ZIP

Un-zip the download file to a folder.

Open PyCharm, new project, chose the folder of TeachKidsCoding/ch1

You will see `drawline.py` under ch1 folder in PyCharm.

Double click `drawline.py`, put your mouse on drawline.py window, right click, Run `drawline.py` .

If you can see an image pop up, you are ready for the next step.

You can also try to run `drawfib.py` , If you got an error of missing `numpy` package. Try to install `numpy` as `matplotlib` .

# Chapter 2

# Very Basic Stuff

Let's start

## 2.1 Printing

Start a new project and chose the folder from TeachKidsCoding/ch1

Open the code `printing_01.py`

You will see the first line is colored, the rest are all gray because they all start with #.

The computer only deal with colored lines.

Right click, Run `printing_01.py`

Try to complete the tasks.

## 2.2 Variables

Open the code `variables_02.py`

It is very important to understand = sign in program is different from = sign in math.

Understand variable has type. Know the difference of string, integer and decimal numbers.

## 2.3 Basic Math

Remainder and power. Write some math expressions on paper, try to translate them to python. For example $\frac{3-(7+2^3)^2}{2(5-2^2)+6(8+7)}$. Be aware what the difference of integer values and decimal values.

## 2.4 Make Decision

Understand "True" and "False". Understand "and" and "or". Try "if", "if ... else ...", "if ... elif ... else ..."

## 2.5 Loop

**For Loop** If you need do something again and again, you need consider using loop. We start with a simple case: `for i in range(0, 10):` . To understand what `ange(0,10)` is, it is actually a list for numbers from 0 to 9. Then variable `i` takes one value each time.

We also need to understand the code block. if the lines are in the same block, they need line up vertically. The code block is also used in if/elfi section.