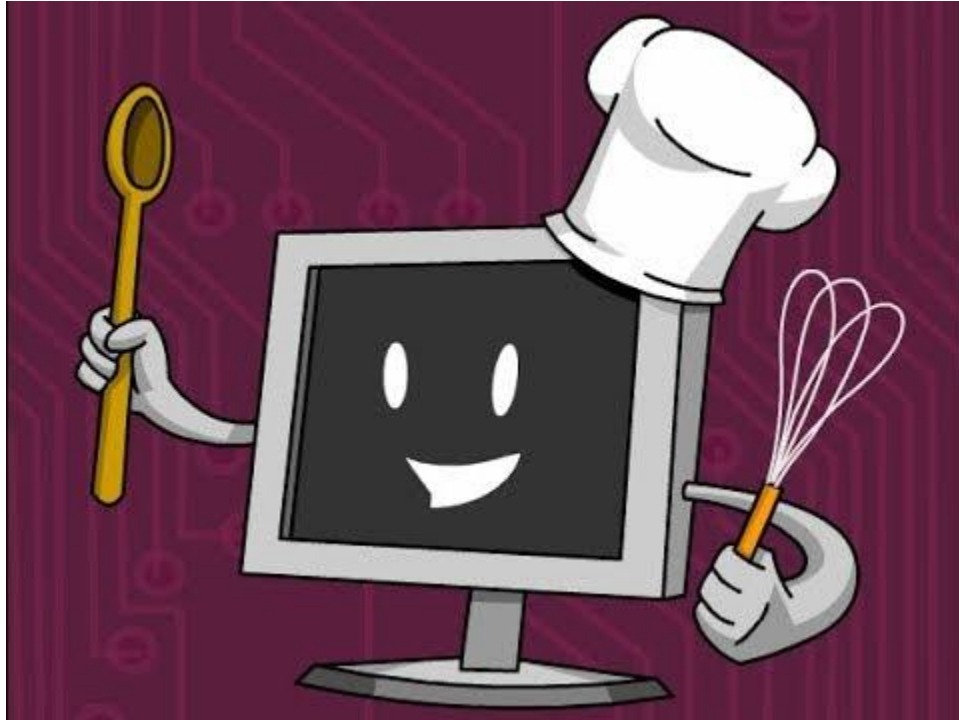# Intro to Python

What is a computer program?

What is a programming language?

A concise set of simple instructions for a computer that allows you to automate tasks.

- Coding concepts = Vocabulary

- Syntax = Grammar

Why Python?

- Free

- Works on all operating systems (Windows/Mac/Linux)

- Simple syntax

- Popular (especially in science)

- Many libraries exist for complex tasks

Variable Name Rules

Variables can have **almost** any name *except:*

- Names with spaces

- An existing Python command

- Names that start with a numeral or symbol

Variable Names vs Strings

- Variable names never have quotes around them:

  sample_variable

- Strings always have quotes around them:

  "sample string"

The Basics: Simple Data Types

- **integer** - a whole number (3, 105, -2, 57623021)

- **float** - a decimal number (3.0, 1.05, -0.0002, 5762.3021)

- **string** - a word or series of characters. Must be written inside quotation marks: " " ("dog", "5", "My friend is 6 feet tall")

Math in Python

You can use Python like a calculator to perform mathematical operations on values and variables.

- add: +

- subtract: -

- multiply: *

- divide: /

The Basics: Functions

- Commands that perform complex actions

- Always end in "()"

- The function will take whatever you put in the () as input

- Some are built-in, but you can (and will) make your own!

  `print()` outputs some information

  `type()` tells you the data type of something

The Basics: Running code

- In Jupyter Notebooks, you can run one cell at a time (not all coding environments are broken into cells). **Don't forget to run your cells!**

- When you run a cell, every line of code in that cell will run **from top to bottom.** Each new command needs to go on a new line.

- When you run the next cell, it will build on the code from the last cell

- Don't forget: If you run a cell without running an important cell above it, your code might not work

- If you make any changes to a cell, you need to re-run it or they won't take effect.