

# Programming Thinking

## Introduction

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# About

The Professor

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Ask me anything

# About

## The Course

- 7 sessions

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## The Course

- 7 sessions
- 1 final exam

## Grading

This course is graded as NGS/NGU, and the note will depend on the final exam.

The final exam consists of multiple choice/multiple answer questions, and is open book.

Criteria	Score %
Final Exam	100 %

## Grading

The grading for this course will either be **Non Graded Satisfactory** or **Non Graded Unsatisfactory**.

If you get 50% or more in the overall score, you get **NGS**, and **NGU** otherwise.



## Participation

Please, raise your hand at any point in class if you want to ask something, make an useful comment, or answer a question. (if remote, use Zoom's raise hand feature, so that it's easier to track it)

# Learning Objectives

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- Learn What's programming
- Understand how computers execute programs
- Learn the basics of Python

# Plan for this session

- Learn about software

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- Understand what are algorithms and data structures

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- Learn about software
- Understand what are algorithms and data structures
- Install Anaconda



# Language

Throughout this course we will use Python as our programming language, but there are many more!

# Language

There are several ways for categorizing programming languages.

## Language classification

Language	Paradigm	Execution	Purpose
Python	imperative	interpreted	general
Java	object oriented	compiled	general
Javascript	imperative	interpreted	general
Haskell	functional	compiled	general
SQL	declarative	interpreted	specific
HTML	declarative	interpreted	specific

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# Language

## Python

Python is one of the most used languages right now. Its applications range from Data Science to Web servers

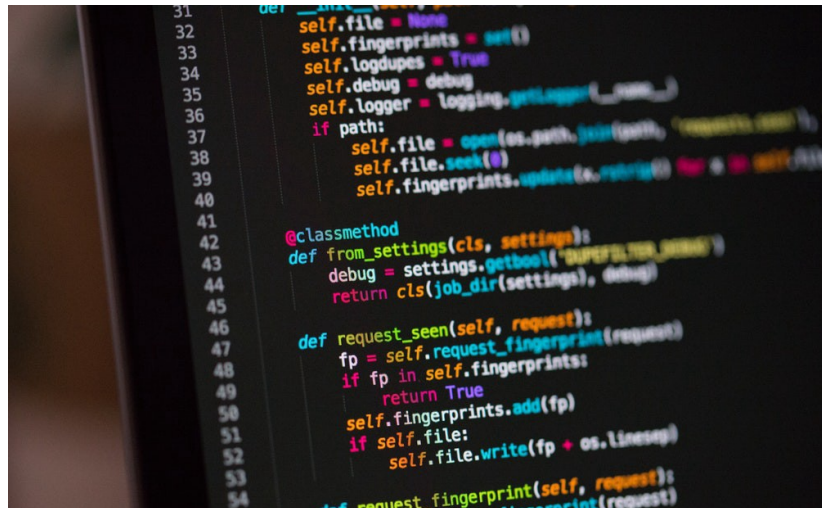
# How do we write code?

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Coding is basically putting words together following a programming language specification.

# How do we write code?

We can put these words directly in a text file and then execute it as a program.



```
31 def __init__(self, settings):
32     self.file = None
33     self.fingerprints = set()
34     self.logdups = True
35     self.debug = debug
36     self.logger = logging.getLogger(__name__)
37     if path:
38         self.file = open(os.path.join(path, 'requests.json'),
39                         'w')
40         self.file.seek(0)
41         self.fingerprints.update(self.logger.handlers)
42
43 @classmethod
44 def from_settings(cls, settings):
45     debug = settings.getbool('SUPERFINGER_DEBUG')
46     return cls(job_dir(settings), debug)
47
48 def request_seen(self, request):
49     fp = self.request_fingerprint(request)
50     if fp in self.fingerprints:
51         return True
52     self.fingerprints.add(fp)
53     if self.file:
54         self.file.write(fp + os.linesep)
```

# How do we write code?

Or we can feed these words directly into the programming language console.



## Python console

Let's see how do code looks in the console!

# Install Anaconda platform

Now we will install the Anaconda platform in our computers.

- 1 go to <https://www.anaconda.com/products/individual>
- 2 Go to the bottom of the page, to the **Anaconda Installers** section, and download the graphical installer for the 3.7 version **for your operating system**.
- 3 In the installer, when you're given the option to install the PyCharm IDE, or Visual Studio Code, you can ignore it, we're not going to use it.

## Checkpoint

Anybody is lost or has problems installing the software?

# Programs

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This task can be something **big**, like handling a nuclear reactor, or something **small** like Ctrl-c/Ctrl-v.

There are two main components of programs, **algorithms** & **data structures**.

# Algorithms



# Algorithms

What is an algorithm?

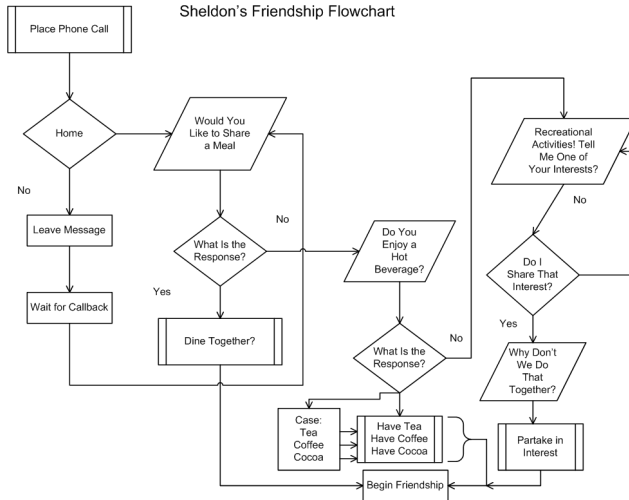
# Algorithms

What is an algorithm?

An algorithm is a sequence of steps that guide the computer in how to solve a problem

# Algorithms

link to the video



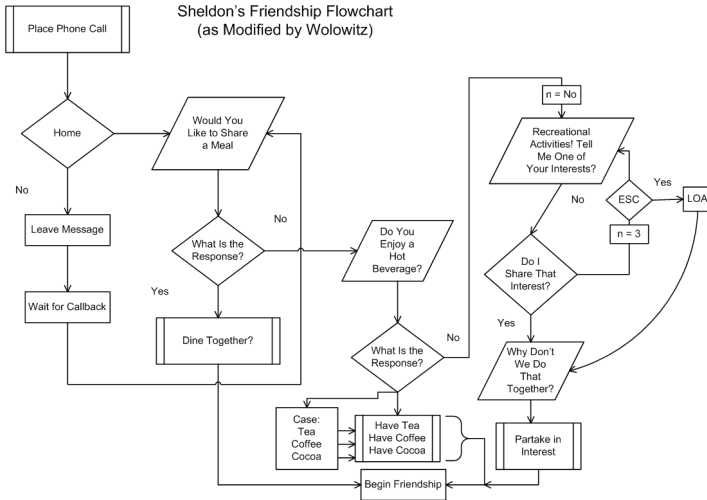
# Algorithms

What's wrong with this algorithm? why did Wolowitz need to fix it?

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There was a **bug**, an infinite loop

# Algorithms



What other cases of bugs do we know?

Business

## Knight Shows How to Lose \$440 Million in 30 Minutes

By [Matthew Philips](#)

August 2, 2012, 11:10 PM GMT+1



<https://www.bloomberg.com/news/articles/2012-08-02/knight-shows-how-to-lose-440-million-in-30-minutes>



# Recap

# Recap

- We'll use Python for learning programming in this course.

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- We'll use Python for learning programming in this course.
- Algorithms, like cooking recipes, will guide our program to perform what we want.

# Recommended reading

**What Is Code** is a great essay by Paul Ford. (it's a bit long, you don't need to read it for tomorrow)

<https://www.bloomberg.com/graphics/2015-paul-ford-what-is-code/>

Netflix' code vice Netflix' explained