OIM3640 - Problem Solving and Software Design

Agenda

- Introducing yourself
- Introduction to the course
  - Syllabus
  - Term Project (*mentioned*)
  - Software
- Write your first Python program!

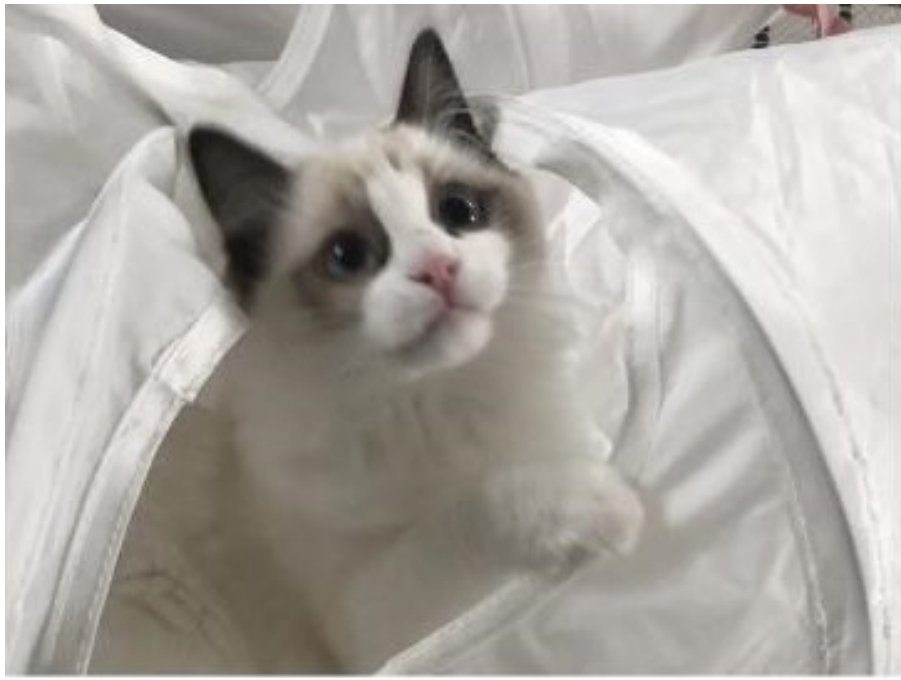
Welcome! How are you doing?

Please introduce yourself, including:

- **Who** are you? **Where** did you come from?
- Are you a **sophomore**, **junior** or **senior**? What was your **best Babson moment**?
- What is your **concentration**? Are you going to rule the world with that?
- **Why** did you decide to take this class?
- Do you have any **programming experience**?
- How was your **2022** and your **winter break**? Did you do **anything exciting** or just binge-watch a lot of Netflix?
- How can we **remember** you?

About Me

- Instructor: **Zhi Li** (李直)
- Email: zli@babson.edu
- Office: Babson Hall 216D
- Office Hours:
  - In-person:
    - Tuesday: 11:30AM - 12:30PM
    - Thursday: 6:30PM - 7:30PM
  - Online via Webex: by appointment



A Quick Survey

1. What **programming languages** have you heard of?
2. What **IDE** have you used?
3. Have you used **Git/GitHub** before?
4. Have you created **website(s)** before?

What is this course about?

Well, let me first tell you that this course is ***NOT*** about...

- Computer science theories
- Solving problems without programming
- Data structure and algorithms
- Front-end technologies
- Game development and graphics programming
- Scientific computing, big data and data visualization
- Advanced libraries such as `pytorch` for deep learning
- Distributed systems, cloud computing and microservices

Seriously, what is this course about?

- Variables, expressions and statements
- Basic data types (e.g. integers, strings, lists, dictionaries)
- Control structures (e.g. loops, if-else statements, for/while loops)
- Functions and modules
- File Input/Output
- Basic Object-Oriented Programming (OOP) concepts
- Exception handling
- Basic built-in and third-party libraries
- Database access and SQLite
- Text Analysis
- Web scraping
- Popular web frameworks (Flask)
- Basic Algorithm and problem solving strategies
- Debugging and testing
- Version control and collaboration
- Pair programming
- ...


BUY

What really matters are ...

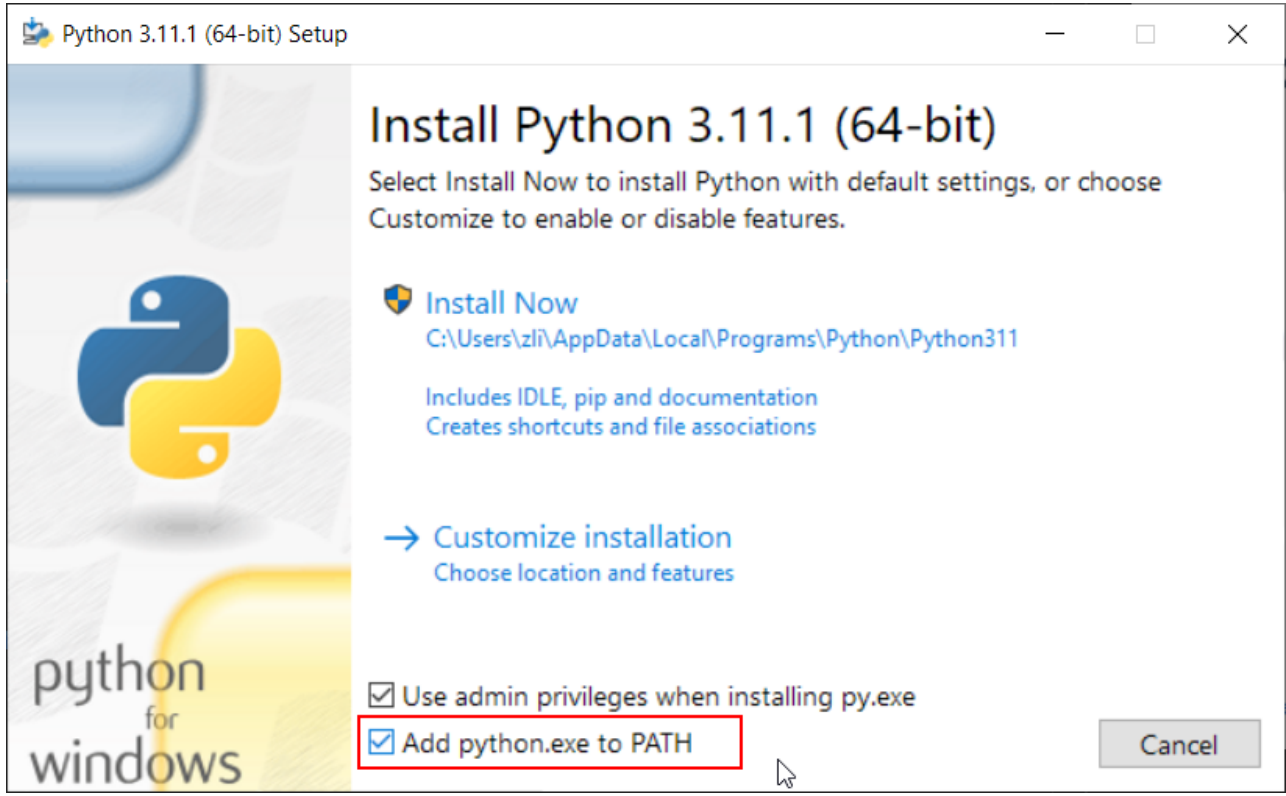
- Familiarizing yourself with basic programming concepts
- Thinking like a software engineer and a computer scientist
- Learning how to learn programming and how to get "unstuck"
- Collaborating effectively with engineers and other team members through the use of tools and clear communication
- Equipping you with the tools and mindset to succeed after completing this course

Syllabus

- Course Objectives
- Prerequisites and Textbook
- Software
- Term Project
- Graded Homework/In-Class Exercises/~~Exam~~
- Grading
- Course Policies

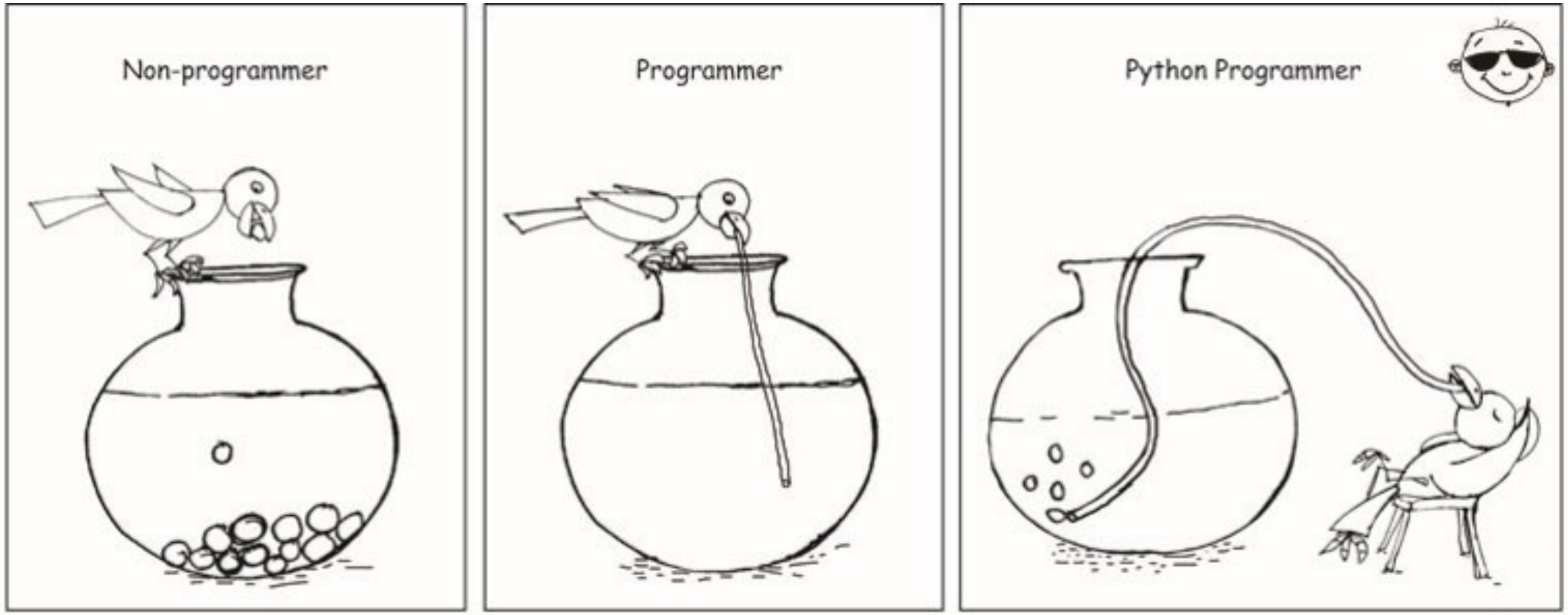
Software

- Python
- Visual Studio Code (VSCode), and extensions
  - Python
  - vscode-icons
- GitHub Desktop
  - Sign up for GitHub (using Babson email)



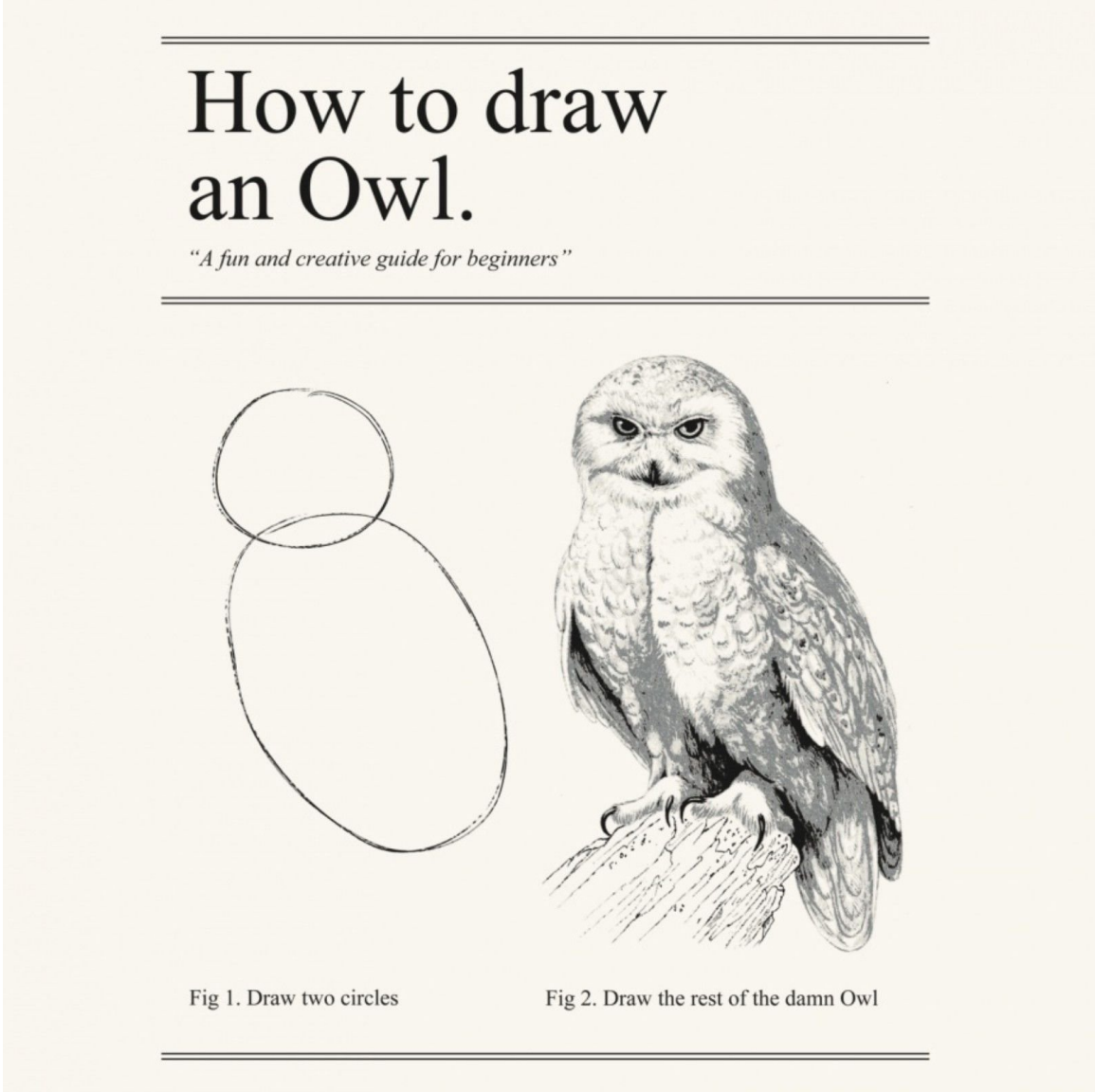
How to Learn (Python) Programming?

Python is ...Simple and Elegant!



Source: http://lpycot.appspot.com

... but programming is hard, like, really hard!



How to draw an Owl.

"A fun and creative guide for beginners"

Fig 1. Draw two circles

Fig 2. Draw the rest of the damn Owl

DO NOT take the “couch potato” approach

Practice!

Practice!

Practice!

DO NOT copy and paste!

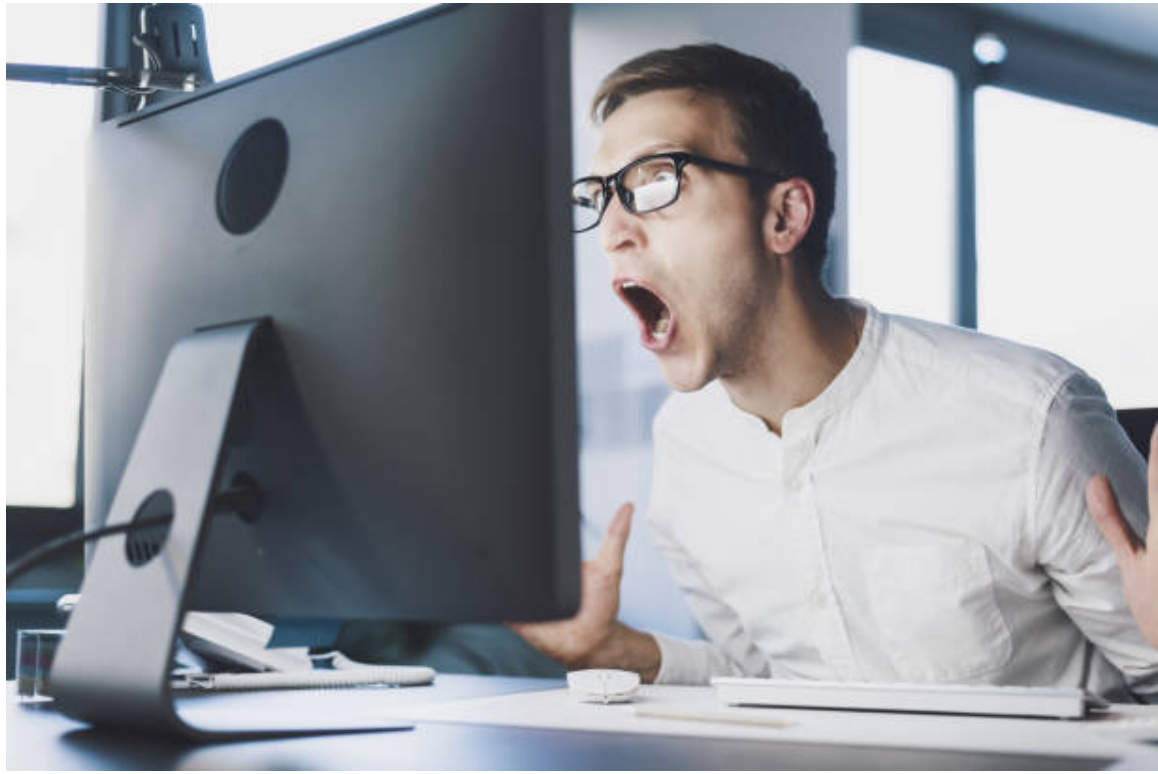
Ask Questions

Ask Questions the Smart Way

- The XY Problem
- How do I ask a good question
- How To Ask Questions The Smart Way
- Getting Answers

DO NOT panic!

- Almost everyone hits a rough patch in the course at some point.
- Don't let it discourage you.
- It's normal!



What if you got "stuck"

- Take a break
- Break the problem down
- Keep trying
- Debug
- Ask for help


Google
stackoverflow
reddit
slack

More on Learning to Code

- People **new** to programming don’t know what it is like to be a programmer, or to take a programming course.
- Having unrealistic expectations, such as expecting things to work perfectly **the first time**, can lead to disappointment.
- It's important not to give up at the first sign of an error.
- **Expect**:
  - to spend hours, entire nights, even multiple days getting things to work
  - to learn a lot by yourself
- The **real learning** happens when you encounter obstacles and overcome them.
- Avoid relying on **spoon-fed** answers, as it can lead to weaker problem-solving skills in the long run.

How to Cheat without Being Caught

- If you're going to cheat, here are some tips:
  - Do not submit code that has a matching md5sum as your friend's code.
  - Don't share your code with others if it is supposed to be individual work.
  - Avoid simply changing comments and spacing, as the code can be tokenized to eliminate these differences.
  - Changing variable names, moving definitions, or copying only part of other's code will be detected as well.
  - You may not use code found on the internet or written by AI.
- If you still decide to cheat, the **only way to cheat safely** is to rewrite the assignment from scratch.

Collaboration policy

- For final projects and other specified group projects, you may work in a team and submit a single, joint assignment.
  - It's important to review and follow the guidelines as it may vary per project.
  - You also have the option to work independently.
- Forming study groups is encouraged.
  - However, for group work, you must not share code with anyone other than your assigned partner. For individual work, sharing code with any other person is prohibited.
- To truly learn and understand, you must independently write your own code.
- Any violation of this collaboration policy will be handled under the school's academic misconduct policy and may result in a failure of the course.


Questions?

Now, prepare to get your hands dirty!