IHI-ISG Python Workshop Syllabus

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Basic Course Information

- What: two workshops on Python programming
- When: Sep. 24th and Oct. 29th, from 12 pm to 5 pm.
- Where: PWB and zoom
- Who:
  - Instructor: Changye Li (lixx3013@umn.edu)
- Communication: Emails

Course Description and Learning Outcomes

Python is one of the most popular object-oriented programming (OOP) languages for many disciplines that requires computing. The goal of this workshop is to help students understand how computing can be applied to problem-solving in their own expertise, and introduce fundamental concepts of computer science, including algorithms, objects, data structures, by learning the basic and advanced syntax of Python.

After this workshop, students should be able to

- think and write code as computer scientists
- solve real world problems with programming concepts, including data expressions, conditionals and loops, data types and structures
- understand OOP paradigm and concepts, and apply concepts, including class and object, to discipline-specific problems
- program in a professional way, including writing code professionally, integrated development environment (IDE), GIT, debuggers

Prerequisite

IHI graduate students, and Non-CS graduate students who are willing to learn programming.

Course Format and Content

This workshop will be offered in hybrid mode. That being said, students can choose either to attend in-person or via zoom. The zoom link will be provided before the first workshop.

This workshop will be offered in a combination of lecture, discussion and lab. In other words, students are expected to complete several quizzes or short programming assignments when they attend this workshop.

The course materials can be found on: `https://github.com/changyeli/isg-programming-club`

First workshop

- Course overview (5 mins)
- Python installation and environment setup (30 mins)
- Basic Python syntax and quizzes (1.5 hour)
- Break (30 mins)
- Python data structure, control structures and functions and short assignments (2.5 hour)

Second workshop

- Review of previous workshop (30 mins)
- Basic OOP design with short assignments (1 hour)
- File handling with quizzes (1 hour)
- Break (30 mins)
- Basic algorithm and debugging with quizzes (1.5 hour)

Hardware Requirements

Windows, Mac or Linux laptop with internet connection

Recommended Books (Optional)

- Programming in Python 3 by Mark Summerfield
- Python Cookbook by David Beazley