IM 2011: Programming for Business Computing (商管程式設計) Fall 2016

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In recent years, information technology (IT) has transformed the way people do commerce and business. Some obvious examples are online channels, digital marketing, automatic replenishment, program trading, display advertisement, social networking sites, business analytics, just to name a few. Understanding the capability of IT obviously brings in huge advantage to a business decision maker: Either you do it by yourself when you are junior, or you know who are the right people to delegate to when you are senior. Being able to communicate with (or even lead) IT people is also critical.

In this course, we will introduce how to write computer programs for business computing. We cannot make you a software engineer, who build software products to sell to consumers. Instead, we plan to enable you to write programs to facilitate your own works (e.g., analyze a huge data set that cannot be done with MS Excel). More importantly, you will know how a computer program works, the ways computer scientists and software engineers think, and how to leverage IT to bring in competitive advantages to your organization and yourself.

The programming language we will introduce is Python (version 2.7), one of the most popular and powerful high-level programming language nowadays. The language Python is just something that facilitates the delivery of the principles of computer programming. What really matter are the conceptual principles, not the syntax or rules. Our objective is not to teach you how to write Python programs; we want to make you be able to learn other programming languages (like R, SAS, Javascript, etc.) in the future.

This is an elective course for everyone. If too many students want to take this course, students in the college of management has the highest priority. We do not assume any background in computer programming, and there is no prerequisite for this course. Auditing is welcome if and only if the classroom is not full. This course is taught in Chinese.

Basic information

Instructors.

- Ling-Chieh Kung (孔令傑): lckung(AT)ntu.edu.tw; Room 413, Management Building 2. `http://www.im.ntu.edu.tw/~lckung/`.
- Hsin-Min Lu (盧信銘): luim(AT)ntu.edu.tw; Room 509, Management Building 2. `http://www.im.ntu.edu.tw/~lu/`.

Teaching Assistants.

- Amber Chang (張郁卿): r04725008(AT)ntu.edu.tw.
- Parker Chiang (江柏宣): r04725020(AT)ntu.edu.tw.
- Chien Huang (黃千瑜): r04725021(AT)ntu.edu.tw.
- Jenny Chen (陳妍秀): r05725037(AT)ntu.edu.tw.

Meetings.

- Lectures: 9:10-12:10 pm, Tuesday. Room B01, Management Building 1.
- Labs (option 1): 6:25-8:10 pm, Wednesday. Room 101, Management Building 1.
- Labs (option 2): 6:25-8:10 pm, Thursday. Large Computer Room, Management Building 1.

Textbook. A. Downey, *Think Python.* Available at `http://greenteapress.com/wp/think-python/`.

On-line Resources.

- To check grades and download materials: CEIBA.
- To submit homework: PDOGS (`http://lckung.im.ntu.edu.tw`).
- To discuss: `https://piazza.com/ntu.edu.tw/fall2016/im2011`.

Grading

Breakdown.

- Homework: 35%.
- Three exams: 40% (15% each for the best two and 10% for the worst one).
- Final project: 25%.
- (Bonus) class participation: 5%.

Conversion rule. The final letter grades will be given according to the following conversion rule:

Letter	Range	Letter	Range	Letter	Range	Letter	Range	Letter	Range
F	$[0, 60)$	C−	$[60, 63)$	C	$[63, 67)$	C+	$[67, 70)$	B−	$[70, 73)$
B	$[73, 77)$	B+	$[77, 80)$	A−	$[80, 85)$	A	$[85, 90)$	A+	$[90, 100]$

Regrading. The TAs will grade everything except the final project and regrade them upon request. If you have a regrading request, please contact the TAs directly.

Tentative schedule

Week	Date	Lecture	Textbook	Instructor
1	9/13	Course overview and the basics	Chs. 1 and 2	Kung
2	9/20	Basics of computers	Appendix B	Kung
3	9/27	Conditionals and iterations	Chs. 5 and 7	Kung
4	10/4	*Applications in Operations Management*	N/A	Kung
5	10/11	***Midterm exam 1***	N/A	Kung
6	10/18	Functions and fruitful functions	Chs. 3 & 6	Lu
7	10/25	Strings and lists	Chs. 8 & 10	Lu
8	11/1	Lists, dictionaries, and tuples	Chs. 10–12	Lu
9	11/8	*Applications in Finance*	N/A	Lu
10	11/15	***Midterm exam 2***	N/A	Lu
11	11/22	Files	Ch. 14	Kung
12	11/29	Classes	Chs. 15–17	Kung
13	12/6	*Applications in Accounting*	N/A	Kung
14	12/13	*Applications in Marketing*	N/A	Kung
15	12/20	***Final project presentations***	N/A	Kung
16	12/27	***Final exam***	N/A	Kung
17	1/3	No class	N/A	N/A
18	1/10	No class	N/A	N/A

Tentative topics for applications:

- Accounting: from transactions to financial reports (e.g., income statements).

- Finance: bid-ask classification (Lee-Ready algorithm), program trading.

- Marketing: frequent pattern mining, clustering (k-means).

- Operations Management: demand forecasting, automatic replenishment.

Policies

Version and textbook. In this semester, we will introduce Python 2.7. That is why the textbook is the first edition of *Think Python*, available at `http://greenteapress.com/wp/think-python/`, not the second edition at `http://greenteapress.com/wp/think-python-2e/`.

Homework. For most weeks, one homework will be assigned on Tuesday or Wednesday and due in one week. Please upload your Python source codes (and other files, if required) to the online grading system PDOGS by the due time. No submission in class or in lab. No hard copy. No late submission. While discussions are highly encouraged, each student must turn in her/his own homework. Cheating will result in severe penalty for everyone involved. The lowest two homework grades will be dropped (i.e., you may skip two homework if you want).

PDOGS. For homework of this course, we rely heavily on the Programming Design Online Grading System (PDOGS, or P-Dogs). After a student uploads her/his Python source file, the system will automatically compile and run the program with respect to some testing data, calculate grades, and display the grades to the student. One may repeatedly modify his program and upload again and again until she/he is satisfied. Only the last grades will be recorded.

Labs. Though not required, students are encouraged to attend labs. In lectures, the instructor will convey the concepts and ideas of Python programming; in labs, the TAs may review materials covered in lectures, discuss past homework, and give students on-site practices. These practices do not count for any grade. However, attending labs is as important as attending lectures. If there is an exam on a Tuesday, there is no lab in that week.

Office hour. You are welcome to contact the instructors to ask them questions. You may ask them to clarify some concepts, give hints for homework problems, or discuss the final project. In fact, discussions not related to course materials are also welcome. However, because one must have enough painful experiences in debugging and revising programs, the instructor (and TAs) may (and actually should) refuse to debug for any student. If you want to schedule a meeting, please feel free to send the instructors an e-mail at any time.

Attendance and class participation. We do not count attendance. If you have something more important to do, feel free to drop a lecture or a lab. Nevertheless, we encourage class participation and include it in evaluating each student. During lecture time or office hour, you are more than welcome to ask or answer questions and provide comments. You are also encouraged to use Piazza for after-class discussions.

Midterm and final projects. Students should form teams to do one final projects. For the final project, the instructor will only specify a rough direction. Each team then decides its own topic, build a program for its own objective, and demonstrate its program to the class publicly.

Exams. For three Wednesdays we will have exams during the lecture time. Students will be asked to write several Python programs in three hours. Students are expected to use their own laptops, but those who do not have one may contact the instructors (in advance, not on-site) for help. The Internet will remain active throughout the exams, and one is allowed to search whatever she/he wants online. However, no communication with any living person is allowed. Cheating will result in a severe penalty for everyone involved.