PROGRAMMING IN PYTHON: AN INTRODUCTORY COURSE

Seminar Leader: **Charlotte Iwasaki** House Leader: **Yoshino Ujike**

Course Description

First and foremost, students of all backgrounds and experience levels are welcome! No prior experience with computer science or programming is necessary! We will start off relatively slow with the basics so that everyone can participate equally and enjoy the activities.

In this seminar, we will discuss the importance of computer science and the many applications of programming, as well as learn the basics of the programming language Python. Programming is essentially problem solving; we will learn how to analyze problem descriptions, write *pseudocode* (words describing how we will solve the problem), and finally write Python code so that the computer can solve the problem for us!

Schedule

Day 1: *Why do we care about Computer Science? Introduction to problem solving & Python*
We will begin with a discussion about why computer science is important and useful. Then, we will talk about programming as a method of problem solving. Together we will consider a few general problems. We will first break them down into tasks and then think of possible methods or techniques to solve them. How can programming help us solve these problems and other more complex problems? We will also begin learning the basics of the computer programming language called Python, including what different keywords and symbols mean.

Day 2: *Problem solving & Python basics continued. Hello world! What else can Python do?*
On the second day we will continue learning the basics of Python. Together, we will practice writing simple programs that print out "hello world" or any other message to the screen and perform mathematical operations. Considering again some of the problems from yesterday, how might we write *pseudocode* (a written "recipe" that describes the solution)? We will practice breaking down problems into clear steps, and will begin considering possible solutions to basic Python problems such as the summation of numbers.

Day 3: *Python projects! Working with loops and conditionals.*
After we have begun to feel more comfortable with the basics, we will learn the concept of loops ("iterables") and begin putting into practice some of the Python syntax we have learned so far. How might loops and conditionals help us implement our code, or convert

our pseudocode into actual Python code? For example, how can we write a program to sum numbers, print sequentially, or reverse the order of a word? In groups, we will practice taking problem statements and breaking them down, writing up pseudocode, and implementing it.

Day 4: *Look what we've done so far! Computer Science applications. Where do we go from here?*
On the final day, each group will share the progress they have made on their project, and we will talk about what we have learned so far. How can we use Computer Science and apply the knowledge in our lives? We will also talk about the wide variety of applications of programming and how we can continue learning from here.

Pre-Seminar Assignments and Readings

We will read excerpts from *How to Think Like a Computer Scientist: Learning with Python* by Allen Downey, Jeffrey Elkner, and Chris Meyers. All of the chapters can be found at the following link:

http://ocw.mit.edu/courses/electrical-engineering-and-computer-science/6-189-a-gentle-introduction-to-programming-using-python-january-iap-2011/readings/

Please feel free to use this source at any time if you want more information or have any questions, but you are only required to read the smaller sections indicated below.

- Python Pre-Assignment Reading (excerpts from Chapters 1 and 2)
- Python Pre-Assignment and Notes (small assignment, definitions, comments, etc. provided by your seminar and house leaders)
- Optional Homework (excerpts from Chapters 2 - 8, only if you find them helpful.)

Message from the House Leader

Hello! My name is Yoshino Ujike and I am a fourth year student at Waseda University. I have just come back from an exchange program at Warwick University, located in the UK. I am interested in Business and attended a Business School during the study abroad. I have also lived in the US for six years. In teaching this course, I want to emphasize that, if you are 文系, please DO NOT shy away from this class! I am 文系 myself, so it's okay.

Knowing the logistics of programming is a definite advantage in the business field since business, just like society, has been shaped around technology and internet so much nowadays, that smooth communication with engineers is vital for businesses to be successful. This is why I want to spread the importance of programming to everyone, but especially to all the 文系 people out there. This class is designed mostly for beginners so it will be a great way to try a new field of study! To be honest, I am a Python beginner too, so let's learn the wonderful world of programming together!

Message from the Seminar Leader

Hi everyone! My name is Charlotte Iwasaki and I am a rising junior at Swarthmore College, located in Philadelphia, Pennsylvania, USA. I am an Engineering and Computer Science double major with side interests in English Literature, playing squash, and taking naps. I was first exposed to computer programming during my sophomore year in high school at my tiny, all girls boarding school. I was initially worried that it might be too difficult, but soon fell in love with the subject.

Programming is often perceived to be a very challenging, scientific, male dominated field, but I believe that it can be fun and accessible to everyone. It's also very useful because it's highly interdisciplinary. By this I mean that it has applications in every field from physics and math to literature, art, and history. Because it is so widely applicable, people of all interests can study CS and then apply it to their field. My goal in planning this seminar is to share with you the joy of programming in Python. Regardless of whether you are a beginner or an expert, programming is something you can pick up easily and apply readily in your studies and work. It's also a subject that you can study in class and outside of class, in groups or alone, making it readily accessible to everyone. I'm excited to introduce you to the world of Computer Science!