

LIS452

Summer 2017

Instructions for Final Project

Overview

The purpose of the final project in this course is different than that of final projects in more typical graduate courses. Usually, we want the project to be fully conceived, fully executed, and fully delivered before the end date of the course. As such, it represents your mastery of the course concepts, tools, and techniques and it wraps the course up with a nice pretty bow.

By contrast, my goal for your final project in this course is that it be well conceived, and only partially executed and delivered by the end of our course. There are two reasons for this different approach. The first is that it is difficult to go through all of the traditional project steps while you are also learning the Python programming language. The second reason is that I am looking for a project that will keep you involved in the programming world as you work over a period of weeks, months, and perhaps years to finish it. If your project is well chosen, you should see it as the beginning of a hobby or the beginning of a scholarly research project rather than the end of this course.

Subject

The subject of your project can be any product or series of products that can be implemented using the Python programming language. When your project reaches its conclusion, it may be a game, a text mining project, a data repository project, a data science project, or any of a thousand other projects that could be implemented using Python. My most important requirement for the subject that you choose is that it be one that interests you enough that you are likely to continue it as a hobby, or as part of your academic pursuits after our course is finished. My motivation here is simple. Students in both higher education and in industry report to me that their programming skills atrophy if they are left unused for an extended period. This project should be one that will motivate you to open it up every few weeks or months to keep your skills sharp and your knowledge expanding.

The Need for Original Work

The project that you choose and the work that you demonstrate at the end of the class should be yours. It is important that you understand the principles that make your solution work, that you type in all of the code yourself, and that you design and execute appropriate tests.

That said, the following uses of other people's work in conducting your project are encouraged:

1. *Python Library Code*

Effective Python programmers do not create all the code that makes up their solution from scratch. They use functions and classes provided by others that have been organized into libraries. The Python Standard Library is quite large and contains extensive code that is considered an extension of the Python language itself. Other libraries have been provided by third parties that address a wide range of common computing use cases (see [Python Package Index](#)). A **key requirement** for your final project is that you **identify a Python library that we did not cover directly during class and to make significant use of that library code in your project.**

2. *Project Inspiration*

You should also feel free to look at the work of others to get inspiration. This includes inspiration for the general topic of your project as well as inspiration for the details of how to solve a particular programming problem. We have long passed the time when the best programmers are expected to dream up ideas for projects and algorithms for solving programming problems from scratch. In fact, the most highly productive designers and programmers are probably some of the best at building upon the work of others.

You might get ideas from:

- a. A list of prior projects undertaken by previous students in this course
- b. Project-oriented Python textbooks like:
Wolfram, D. (2014). Learn Raspberry Pi Programming with Python. Apress.
- c. Use-case-oriented Python textbooks like:
Sweigart, A. (2015). Automate the Boring Stuff with Python: Practical Programming for Total Beginners. No Starch Press.
- d. [Projects-related blog posts at the Raspberry Pi Foundation Web site](#)
- e. Web searching for “Python” plus some hobby interest or research interest of yours (board games, text mining, machine learning).

Feel free to use these resources to get ideas about interesting problems to solve with Python. Also, feel free to look at their code and take some inspiration. Be especially attentive to any parts of the Python Standard Library or third party libraries that they use in their solution.

3. *Consulting with Others*

You should feel free to consult with your colleagues (and me) regarding your project choice and your programming problems. Successful people in this field are highly collaborative. And, more than 20 minutes spent being stuck on the same problem without consulting someone else for their insight and/or help is usually time wasted.

Having said that, please make sure that you identify clearly which work is yours and which pieces have been borrowed from others. Also, please don't copy code from any source without understanding what it does and why it works. You should understand the work that you turn in and you should have done most of the thinking and all of the typing yourself.

The Need to Demonstrate Effective Testing Practices

The purpose of testing is to discover errors. While well-tested code is likely to still contain some latent defects, a good testing process should lead to a reliable product by identifying a high proportion of errors early so that they can be repaired. Because testing is so important to good software development practice, we will be covering testing strategy and testing execution extensively during the course.

The testing-related requirement for your project is that you have an articulated test plan and that you have test code that you can run that demonstrates your progress in implementing the test plan.

How Much Code Do I Need to Create During the Course?

By the time the project is due on the last day of the course, you should be able to clearly articulate your current vision for the project. That means that you should have a coherent description that you can share with the class. The fact that this vision may change later as you work your way through the project in the coming weeks, months, and years is not a problem. This kind of change is an expected part of continuing discovery.

In addition to being able to articulate the concept for the project, you need to have created at least one non-trivial Python program that works, and that demonstrates that you have made a practical start. How much actual code you have written and tested will depend on how much of your project goal is going to be reached with code that you write. For instance, if you have decided to use open source Python code like a Twitter Python toolkit, it may be sufficient to show that you have identified the toolkit, downloaded a current copy, installed it, and written one or two simple test programs that demonstrate that you are on your way to mastering the toolkit.

On the other hand, if you have decided that your project will be a blackjack program that you are going to write from scratch, then you probably will have created and tested more of your own Python code. I will be judging the completeness of your work based on the total effort demonstrated and the extent to which its current state represents a reasonable project start.

As noted above, in addition to delivering the first installment of the “production” code for your project, you also will be expected to deliver the first installment of the “test” code for your project.

What Else Do I Need to Deliver?

You should also have developed **a plan for your next three steps on your project**. They need not be gigantic steps. They need not all be coding steps – some can be research oriented. I want to see that you have a reasonable and concrete plan for how you will proceed when the class is over.

What About the Project Presentation?

On the last day of the class, each of you will make a presentation that takes at approximately 5 minutes. During your presentation, you should expect to be made a presenter on the Blackboard Collaborate platform. From here, you will make your presentation and demonstrate your code. Please create a few presentation slides using PowerPoint or some other equivalent

that you can use to keep on track and keep the class informed. My experience is that it is not possible to present more than one slide per minute. So, you will only need a handful of slides.

As for content, I want you to cover the following:

1. The vision for your project
2. Your production code created thus far
3. Your test code created thus far
4. Specific plans for the next 3 steps of your project

Is There Anything Else to Hand In?

Yes. In addition to the slides from your presentation, I am expecting you to turn in your project code in a form that I can easily test. For many, this will only require zipping up your PyCharm project and submitting the zip file in the same way that you have done for coding assignments. For those of you who have used third party Python libraries that are not part of the default Anaconda distribution that we downloaded at the beginning of the semester, you will need to make arrangements with me so that I can duplicate your test environment.