The exam material will include all material from course lectures, course notes, labs, and quizzes. The purpose of the exam is to test your ability to read and write Python programs.

1 Preparing for Exam #3

In terms of preparing for the exam, I have the following advice.

1. *Study weekly quizzes.* Make sure you understand every question on the weekly quizzes.

2. *Reading practice.* Gather all of the programs that we have discussed during class lecture. For each program that we discussed in lecture, trace through the code on paper. Next, compare the output you got on paper with the output when the program is run on the computer. If there is a match, then you understand the program. Otherwise, there is an issue with your understanding of the program that must be resolved.

3. *Writing practice.* Pick a few of the programs that we discussed during class lecture. Write a different solution for the problem. Remember, there is more than one way to solve a problem.

4. *Study lab problems.* Make sure you understand the lab problems. Many of the labs required you to write several small functions in order to complete the assignment. These small functions are perfect for test questions.

5. *Study sample exam questions.* There will be a set of sample questions to also help you study for the exam.

If you study in the above manner, you will be well-prepared for the exam.

2 Exam #3 Topics

1. List Comprehension

2. Dictionaries
   
   a) What is a dictionary?

   b) What types of applications require the use of dictionaries?

   c) How are sets and dictionaries similar?

   d) How are sets and dictionaries different?
e) Dictionary operations such as:
   - inserting a (key, value) pair in the dictionary
   - retrieving a value based on a particular key
   - determining whether a key is in the dictionary
   - retrieving a copy of the dictionary’s list of (key, value) pairs
   - retrieving a copy of the dictionary’s list of keys
   - retrieving a copy of the dictionary’s list of values

3. Inverted Dictionaries
   a) What is meant by an inverted dictionary? How is it different from a standard dictionary?
   b) What types of applications require the use of inverted dictionaries?

4. Sudoku Solver
   a) Two dimensional matrix
   b) enumerate built-in function
   c) Be able to solve a Sudoku puzzle using the strategies that were implemented in Python.

5. Advanced Function Topics
   a) Nested functions
   b) Order of parameters
   c) Default values for parameters

6. Basics of Computers
   a) Have a high-level picture of what is meant by processor, memory, hard drive.
   b) Be able to disassemble your laptop during the exam. ©

7. Representations of Numbers
   a) Decimal
   b) Binary
   c) Hexadecimal
   d) Be able to convert between binary and decimal numbers.

8. American Standard Code for Information Interchange (ASCII)
   a) Plain text files are files that use ASCII-encoded characters.
   b) General binary files (e.g., pdf, docx files) are not restricted to ASCII-encoded characters.
   c) You can find an ASCII table at http://frank.harvard.edu/aoe/images/t10r3.pdf.