CPSC 1301, Computer Science I Homework 13

Chapter 20, *Learning Python*

Readings

Read chapter 20 in the *Learning Python* book.

Discussion Questions

Answer the discussion questions in writing.

1. How would you explain what a *list comprehension* to your grandmother (who presumably does not know anything about computers or technology)?
2. What is the syntax for a list comprehension that produces a simple list from an iterable?
3. What is the syntax for a list comprehension that produces a list from an iterable with a filter?
4. What is the syntax for a list comprehension that produces a list from two nested iterables?
5. Given this matrix:

   ```
   m = [[1,2,3],
        [4,5,6],
        [7,8,9]]
   ```

   answer the following questions:

   (a) Write a list comprehension that produces the second row, [4,5,6].
   (b) Write a list comprehension that produces the third column, [3,6,9].
   (c) Write a list comprehension that produces the left diagonal, [1,5,9].
   (d) (optional) For extra credit, write a list comprehension that produces the second left (broken) diagonal, [2,6,7].
6. What is a *generator function*?
7. What is a *generator expression*?
8. (not in book) What is *lazy evaluation*? Name one lazy language.
9. How are generator functions different from "regular" functions?
10. How are generator expressions different from list comprehensions?
11. What does the book mean when it states that *generators are single iteration objects*?
12. In your own words, give a simple explanation of the functionality of `zip`.
13. In your own words, give a simple explanation of the functionality of `map`.
14. In your own words, give a simple explanation of the functionality of `reduce`.
15. (not in book) A very popular database technology implements implements `map/reduce`. Name one of these databases. Why do you think that it is currently so popular?