

MIDTERM STUDY GUIDE

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Weeks 1-4

Because the exam is cumulative, please do review all of the concepts from the [Exam 1 study guide](#). And, in particular:

1. For and while loops and the use of the range function (as there was a bit of collective confusion on that in Exam 1) — we'll be testing your understanding again.
2. The difference between print and return in a function. The difference between defining and invoking functions.
3. The modulus operator.

WEEK 6: Files and Dictionaries

Tu, Feb 12: Working with files

- See Python for Everyone videos for more info
- Using the open function and reading a file from a given file path:

```
f = open(some_path, 'r')
for line in f:
    print(line)
f.close()
```

- Different modes of files (r, w, a, and wb).
- List functions (append, pop)
- String functions: split and join

Th, Feb 14: Dictionaries

- Getting keys in a dictionary
- Getting values in a dictionary
- Assigning values to a dictionary
- Retrieving a value from a dictionary
- Dictionary applications:
 - To represent something (e.g. Spotify, Twitter, etc)
 - To tally or count something
 - As a lookup / crosswalk

Tutorial

- Make sure you understand this tutorial. [Video here](#).

WEEK 7: Data

Tu, Feb 19: “Hodgepodge” (Important Programming Ideas)

- Methods versus functions. What’s the difference?
- *args and *kwargs notation in function definitions
- Binary conversions, bit and byte
- Logical operators: and, or, and not
- Truth tables
- try/except

Th, Feb 21: Intro to Databases

- What is a database?
- What is SQLite?
- SQL Querying:
 - Select Clause
 - From Clause
 - Where Clause
 - Order by Clause
- You won’t have to write queries from scratch, but you will have to interpret simple queries.

WEEK 8: Web Data

Tu, Feb 26: Constructing Data from Messiness

- Understand the purpose of urllib
- This lecture is intended to get you ready for your final project. We will not be testing you on particular packages (BeautifulSoup, wikipedia, etc.)

Tu, Feb 28: Intro to Web APIs

- What is a Web Data API?
- What is JSON?
- How do you specify which piece of data you want to access in a complex dictionary (of nested lists and dictionaries)?

WEEK 9: Making Data Displays

Tu, Mar 5: Data Output

- What are some input and output techniques we have explored in this class?
- What is introspection?

- What is an HTML file?
- Understanding the `string.format()` function
- Understanding the `*` and `**` operators (when preceding a list / dictionary respectively)

STUDY POINTS / QUESTIONS

Don't forget to review the previous content (operators, if/else, etc.).

Data Types

- int, string, float, boolean, None, list, tuple, dictionary, file

New with Strings

- Important methods: **split, join, format, lower, upper, strip, find**
Know how to use them.
- String indexing
- Know techniques for reading individual sections of a file using string methods

New with Lists

- Important methods: **append, pop.**
- list indexing; list iteration.
- Know how to build lists from scratch
- Know how to use them

Iteration

- While loops
- For loops
- For loops using the range function — know the difference between accessing a list item by its index versus by its value.

Try / Except

Understand when and how to use try/except blocks and their purpose

Logic

- Know the logical operators: and, or, and not (including how to combine them)

Dictionaries

Know the three uses we talked about in class:

1. For representing complex data (quick lookup)
2. For grouping and counting

3. For crosswalks and translation tasks (language translation, state capitol lookup, etc.)
4. Know how to access and manipulate dictionary values
5. Know that dictionary values can also be complex dictionaries or sequences
6. Know how to build dictionaries from scratch