

## Objectives

- More on Files

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## Review: Files

- How do we create a new file object?
- How can we read a file?

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## Review: Files

- Conceptually, a file is a **sequence** of data stored in memory
- To use a file in a Python script, create an object of type **file**
  - **file** is a **data type** **constructor** - "constructs" a file object
  - `<varname> = file(<filename>, <mode>)`
    - `<filename>`: string
    - `<mode>`: string, either "r" for read or "w" for write
  - Ex: `dataFile = file("years.dat", "r")`

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## Review: Common File Methods

Method Name	Functionality
<code>read()</code>	Read the entire content from the file, <i>returned</i> as a string object
<code>readline()</code>	Read one line from file, <i>returned</i> as a string object (which includes the "\n"). If it returns "", then you've reached the end of the file
<code>write(string)</code>	Write a string to the file
<code>close()</code>	Close the file. <i>Must</i> close the file after done reading from/writing to a file

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## Review: Reading from a File

- Examples of reading from a file using file methods
  - Show file: `data/years.dat` Typically use .dat or .txt file extension for files containing data/text
- `file_read.py` (using `read()`)
- `file_read2.py` (using `readline()`)

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## Review: Reading from a File

- Recall that a file is a **sequence** of data
- Can use a **for** loop to iterate through a file
  - A line (of type **str**) from the file
  - file object
  - ```
for line in dataFile:
    print line
```
  - Read as: for each line in the file, do something

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`file_read3.py`

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## Problem: Searching a File

- We want to search a file for some term. We want to know *which lines* of the file contain that term and a *count* of the number of lines that contained that term

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## Problem: Searching a File

- This time, we want to ignore all lines that begin with “#” (a.k.a., the line is a comment)
  - Assume comments are at the beginning of the line
  - Why would we have comments in a data file?
    - `data/years2.dat`
  - How can we revise the previous solution to do this?

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## Writing to a File

- Create a file object in **write** mode:
  - `myFile = file("years.txt", "w")`
- Example: create a file from user input
  - `file_write.py`
  - What happens if execute the program again with different user input?

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## Handling Numeric Data

- We have been dealing with reading and writing *strings* so far
  - Read from a file: get a string
  - Write to file: use a string
- What do we need to do to **read numbers** from a file?
- How can we **write numbers** to a file?

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## Handling Numeric Data

- We have been dealing with reading and writing *strings* so far
  - Read from a file: get a string
  - Write to file: use a string
- What do we need to do to **read numbers** from a file?
  - Cast as a numeric type, e.g., `int` or `float`
- How can we **write numbers** to a file?
  - Cast number as a `str`

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## Problem: Temperature Data

- **Given:** data file that contains the daily high temperatures for last year at one location
  - Data file contains one temperature per line
  - Example: `data/florida.dat`
- **Problem:** What is the average high temperature (to 2 decimal places) for the location?

**Rule of Thumb:** Always look at data file before processing it

`avgData.py`

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## Problem: Create a Summary Report

- **Given:** a file containing students names and their years (freshman, sophomore, junior, or senior) for this class
- **Problem:** create a report (in a file) that says the year and how many students from that year are in this class, on the same line.
  - Again, we want to ignore comments in the file

Do we need to start this program from scratch?  
Have code we can use or repackage?

`writeSumReport.py`

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## This Week

- Tuesday: lab
- Wednesday: lists, bring questions for exam
- Friday: exam
  - [Review document id posted on the web site](#)
- No broader issue

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