



PDFs and Spreadsheets



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- Python has the ability to work with PDF files and spreadsheet files.
- In this section we will explore libraries that allow us to interact with these files.
- Note: We highly recommend you work in the same location as the lecture notebooks, since we will be referencing many files in that location.



Working with CSV Files



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- CSV stands for comma separated variables and is a very common output for spreadsheet programs.
- Example:
 - Name, Hours, Rate
 - David, 20, 15
 - Claire, 40, 20



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- Note, that while its possible to export excel files and Google Spreadsheets to .csv files, it **only** exports the information.
- Things like formulas, images, and macros can not be within a .csv file.
- Simply put, a .csv file only contains the raw data from the spreadsheet.



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- We will work with the built-in csv module for Python, which will allow us to grab columns, rows, and values from a .csv file as well as write to a .csv file.
- Keep in mind, this is a very popular space for outside libraries, which you may want to explore.



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- Other libraries to consider:
 - Pandas
 - Full data analysis library, can work with almost any tabular data type.
 - Runs visualizations and analysis.
 - One of my personal favorites, we teach it in various data science courses.



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- Other libraries to consider:
 - Openpyxl
 - Designed specifically for Excel files.
 - Retains a lot of Excel specific functionality.
 - Supports Excel formulas.
 - python-excel.org tracks various other Excel based Python libraries.



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- Other libraries to consider:
 - Google Sheets Python API
 - Direct Python interface for working with Google Spreadsheets.
 - Allows you to directly make changes to the spreadsheets hosted online.
 - More complex syntax, but available in many programming languages.



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- The common factor between all of these spreadsheet programs is that they can always export to .csv.
- Let's explore Python's built-in capabilities with the csv module!



Working with PDF Files



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- PDF stands for Portable Document Format and was developed by Adobe in the 1990s.
- The most important thing to keep in mind is that while PDFs share the same extension and can be viewed in PDF readers, many PDFs are **not** machine readable through Python.



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- Since PDFs mainly encapsulate and display a fixed-layout flat document, there is no machine readable standard format, unlike CSV files.
- This means that a PDF that was simply scanned is highly unlikely to be readable.



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- Additions to PDFs such as images, tables, format adjustments can also render a PDF unreadable by Python.
- There are many paid PDF programs that can read and extract from these files, but we will use the open-source and free PyPDF2 library.



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- We've made sure that the PDF files included in this course material are readable by PyPDF2.
- Unfortunately we can't offer assistance for you own personal PDF files if they are not readable by PyPDF2.



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- Let's explore working with PDF files in Python.
- Remember you will first need to install PyPDF2 at your command line:
 - `pip install PyPDF2`



PDF and CSV Puzzle Exercise Solution