Getting started with csvkit

DATA PROCESSING IN SHELL

Susan Sun
Data Person

What is csvkit?

`csvkit` :

- is a suite of command-line tools
- is developed in Python by Wireservice
- offers data processing and cleaning capabilities on CSV files
- has data capabilities that rival Python, R, and SQL
- documentation: https://csvkit.readthedocs.io/en/latest/

csvkit installation

Install `csvkit` using Python package manager `pip` :

```
pip install csvkit
```

Upgrade `csvkit` to the latest version:

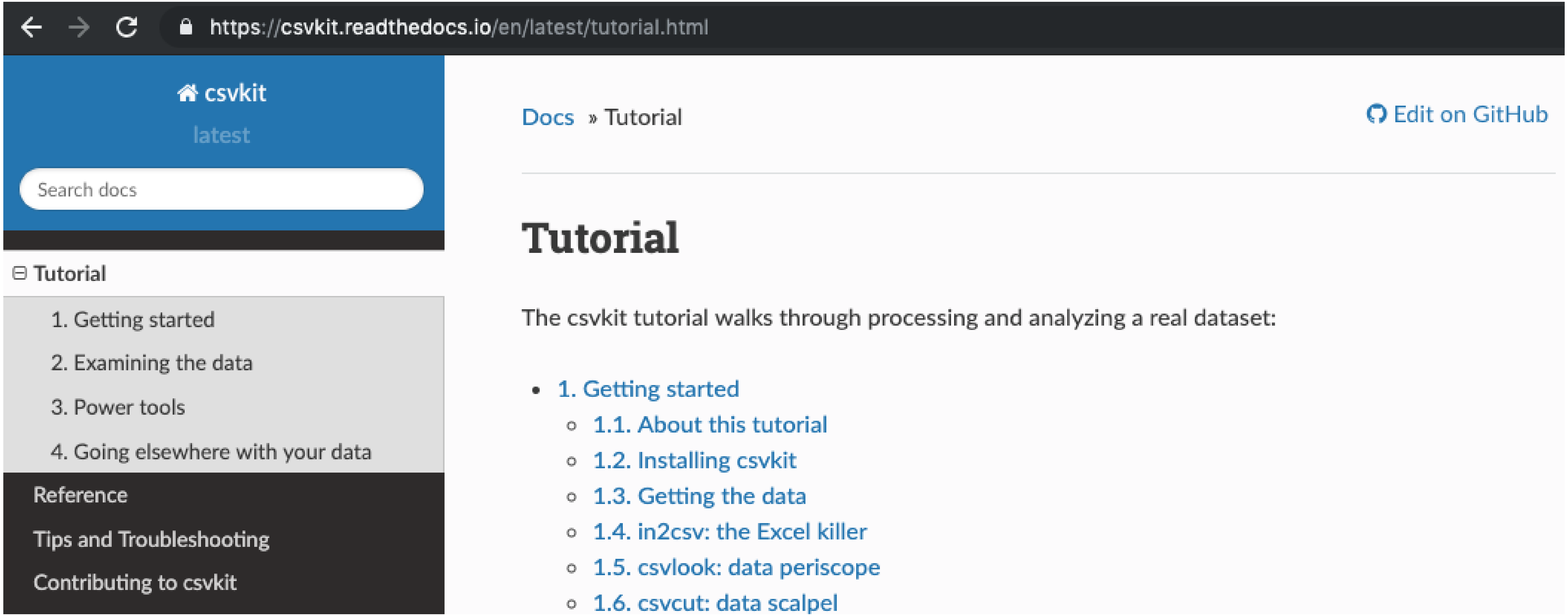
```
pip install --upgrade csvkit
```

Full instructions:

https://csvkit.readthedocs.io/en/latest/tutorial.html.

Browsing the csvkit manual

Web-based documentation: https://csvkit.readthedocs.io/en/latest/tutorial.html



Tutorial

The csvkit tutorial walks through processing and analyzing a real dataset:

- 1. Getting started
  - 1.1. About this tutorial
  - 1.2. Installing csvkit
  - 1.3. Getting the data
  - 1.4. in2csv: the Excel killer
  - 1.5. csvlook: data periscope
  - 1.6. csvcut: data scalpel

in2csv: converting files to CSV

Web-based documentation:

https://csvkit.readthedocs.io/en/latest/scripts/in2csv.html

Command line-based documentation:

```
in2csv --help
in2csv -h
```

```
usage: in2csv [-h] [-d DELIMITER] [-t] [-q QUOTECHAR] [-u {0,1,2,3}] [-b]
              [-p ESCAPECHAR] [-z FIELD_SIZE_LIMIT] [-e ENCODING] [-L LOCALE]
              [-S] [--blanks] [--date-format DATE_FORMAT]
              [--datetime-format DATETIME_FORMAT] [-H] [-K SKIP_LINES] [-v]
```

in2csv: converting files to CSV

Syntax:

```
in2csv SpotifyData.xlsx > SpotifyData.csv
```

Prints the first sheet in Excel to console and does not save

```
in2csv SpotifyData.xlsx
```

`>` redirects the output and saves it as a new file `SpotifyData.csv`

```
> SpotifyData.csv
```

in2csv: converting files to CSV

Use `--names` or `-n` option to print all sheet names in `SpotifyData.xlsx`.

```
in2csv -n SpotifyData.xlsx
```

```
Worksheet1_Popularity
Worksheet2_MusicAttributes
```

Use `--sheet` option followed by the sheet `"Worksheet1_Popularity"` to be converted.

```
in2csv SpotifyData.xlsx --sheet "Worksheet1_Popularity" > Spotify_Popularity.csv
```

in2csv: converting files to CSV

`in2csv` does not print logs to console.

```
in2csv SpotifyData.xlsx --sheet "Worksheet1_Popularity" > Spotify_Popularity.csv
```

Sanity check:

```
ls
```

```
SpotifyData.xlsx  Spotify_Popularity.csv  backup  bin
```

csvlook: data preview on the command line

`csvlook` : renders a CSV to the command line in a Markdown-compatible, fixed-width format

Documentation:

```
csvlook -h
```

```
usage: csvlook [-h] [-d DELIMITER] [-t] [-q QUOTECHAR] [-u {0,1,2,3}] [-b]
               [-p ESCAPECHAR] [-z FIELD_SIZE_LIMIT] [-e ENCODING] [-L LOCALE]
               [-S] [--blanks] [--date-format DATE_FORMAT]
```

csvlook: data preview on the command line

Syntax:

```
csvlook Spotify_Popularity.csv
```

```
| track_id               | popularity |
| ---------------------- | ---------- |
| 118GQ70Sp6pMqn6w1oKuki |          7 |
| 6S7cr72a7a8RVAXzDCRj6m |          7 |
| 7h2qWpMJzIVtiP30E8VDW4 |          7 |
| 3KVQFxJ5CWOcbxdpPYdi4o |          7 |
| 0JjNrI1xmsTfhaiU1R6OVc |          7 |
| 3HjTcZt29JUHg5m60QhlMw |          7 |
```

csvstat: descriptive stats on CSV data files

`csvstat` : prints descriptive summary statistics on all columns in CSV (e.g. mean, median, unique values counts)

Documentation:

```
csvstat -h
```

```
usage: csvstat [-h] [-d DELIMITER] [-t] [-q QUOTECHAR] [-u {0,1,2,3}] [-b]
               [-p ESCAPECHAR] [-z FIELD_SIZE_LIMIT] [-e ENCODING] [-S] [-H]
               [-K SKIP_LINES] [-v] [-l] [--zero] [-V] [--csv] [-n]
```

csvstat: descriptive stats on CSV data files

Syntax:

```
csvstat Spotify_Popularity.csv
```

```
  1. "track_id"


        Type of data:          Text
        Contains null values:  False
        Unique values:         24
        Longest value:         22 characters
        Most common values:    118GQ70Sp6pMqn6w1oKuki (1x)
                               6S7cr72a7a8RVAXzDCRj6m (1x)
```

Let's try some csvkit!

DATA PROCESSING IN SHELL

Filtering data using csvkit

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What does it mean to filter data?

We can create a subset of the original data file by:

1. Filtering the data by column
2. Filtering the data by row

`csvcut` : filters data using **column** name or position

`csvgrep` : filters data by **row** value through exact match, pattern matching, or even regex

csvcut: filtering data by column

`csvcut` : filters and truncates CSV files by **column name** or **column position**

Documentation:

```
csvcut -h
```

```
usage: csvcut [-h] [-d DELIMITER] [-t] [-q QUOTECHAR] [-u {0,1,2,3}] [-b]
              [-p ESCAPECHAR] [-z FIELD_SIZE_LIMIT] [-e ENCODING] [-S] [-H]
              [-K SKIP_LINES] [-v] [-l] [--zero] [-V] [-n] [-c COLUMNS]
```

csvcut: filtering data by column

Use `--names` or `-n` option to print all column names in `Spotify_MusicAttributes.csv`.

```
csvcut -n Spotify_MusicAttributes.csv
```

```
  1: track_id
  2: danceability
  3: duration_ms
```

csvcut: filtering data by column

```
  1: track_id
  2: danceability
  3: duration_ms
```

Returns the first column in the data, by **position**:

```
csvcut -c 1 Spotify_MusicAttributes.csv
```

```
track_id
118GQ70Sp6pMqn6w1oKuki
6S7cr72a7a8RVAXzDCRj6m
```

csvcut: filtering data by column

```
  1: track_id
  2: danceability
  3: duration_ms
```

Returns only the first column in the data, by **name**:

```
csvcut -c "track_id" Spotify_MusicAttributes.csv
```

```
track_id
118GQ70Sp6pMqn6w1oKuki
6S7cr72a7a8RVAXzDCRj6m
```

csvcut: filtering data by column

```
  1: track_id
  2: danceability
  3: duration_ms
```

Returns the second and third column in the data, by **position**:

```
csvcut -c 2,3 Spotify_MusicAttributes.csv
```

```
danceability,duration_ms
0.787,124016.0
0.777,128016.0
0.7959999999999999,132742.0
```

csvcut: filtering data by column

```
  1: track_id
  2: danceability
  3: duration_ms
```

Returns the second and third column in the data, by **name:**

```
csvcut -c "danceability","duration_ms" Spotify_MusicAttributes.csv
```

```
danceability,duration_ms
0.787,124016.0
0.777,128016.0
0.795999999999999,132742.0
```

csvgrep: filtering data by row value

`csvgrep` :

- filters by **row** using exact match or regex fuzzy matching
- must be paired with one of these options:

`-m` : followed by the exact row value to filter

`-r` : followed with a regex pattern

`-f` : followed by the path to a file

Documentation:

```
csvgrep -h
```

csvgrep: filtering data by row value

Find in `Spotify_Popularity.csv` where `track_id` = `5RCPsfzmEpTXMCTNk7wEfQ`

```
csvgrep -c "track_id" -m 5RCPsfzmEpTXMCTNk7wEfQ Spotify_Popularity.csv
```

```
track_id,popularity
5RCPsfzmEpTXMCTNk7wEfQ,7.0
```

```
csvgrep -c 1 -m 5RCPsfzmEpTXMCTNk7wEfQ Spotify_Popularity.csv
```

```
track_id,popularity
5RCPsfzmEpTXMCTNk7wEfQ,7.0
```

Let's do data filtering with csvkit!

DATA PROCESSING IN SHELL

Stacking data and chaining commands with csvkit

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csvstack: stacking multiple CSV files

`csvstack` : stacks up the rows from two or more CSV files

Documentation:

```
csvstack -h
```

```
usage: csvstack [-h] [-d DELIMITER] [-t] [-q QUOTECHAR] [-u {0,1,2,3}] [-b]
                [-p ESCAPECHAR] [-z FIELD_SIZE_LIMIT] [-e ENCODING] [-S] [-H]
                [-n GROUP_NAME] [--filenames]
```

csvstack: stacking multiple CSV files

Stack two similar files `Spotify_Rank6.csv` and `Spotify_Rank7.csv` into one file.

Preview the data to check schema:

```
csvlook Spotify_Rank6.csv
```

```
| track_id               | popularity |
| ---------------------- | ---------- |
| 7JYCpIzpoidDOnnmxmHwtj |          6 |
| 0mmFibEg5NuULMwTVN2tRU |          6 |
```

csvstack: stacking multiple CSV files

```
csvlook Spotify_Rank7.csv
```

```
| track_id               | popularity |
| ---------------------- | ---------- |
| 118GQ70Sp6pMqn6w1oKuki |          7 |
| 6S7cr72a7a8RVAXzDCRj6m |          7 |
```

csvstack: stacking multiple CSV files

Syntax:

```
csvstack Spotify_Rank6.csv Spotify_Rank7.csv > Spotify_AllRanks.csv
```

```
csvlook Spotify_AllRanks.csv
```

```
| track_id               | popularity |
| ---------------------- | ---------- |
| 7JYCpIzpoidDOnnmxmHwtj |          6 |
| 0mmFibEg5NuULMwTVN2tRU |          6 |
| 118GQ70Sp6pMqn6w1oKuki |          7 |
| 6S7cr72a7a8RVAXzDCRj6m |          7 |
```

csvstack: stacking multiple CSV files

```
csvstack -g "Rank6","Rank7" \
Spotify_Rank6.csv Spotify_Rank7.csv > Spotify_AllRanks.csv
```

```
csvlook Spotify_AllRanks.csv
```

```
| group | track_id               | popularity |
| ----- | ---------------------- | ---------- |
| Rank6 | 7JYCpIzpoidDOnnmxmHwtj |          6 |
| Rank6 | 0mmFibEg5NuULMwTVN2tRU |          6 |
| Rank7 | 118GQ70Sp6pMqn6w1oKuki |          7 |
| Rank7 | 6S7cr72a7a8RVAXzDCRj6m |          7 |
```

csvstack: stacking multiple CSV files

```
csvstack -g "Rank6","Rank7" -n "source" \
Spotify_Rank6.csv Spotify_Rank7.csv > Spotify_AllRanks.csv
```

```
csvlook Spotify_AllRanks.csv
```

```
| source| track_id               | popularity |
| ----- | ---------------------- | ---------- |
| Rank6 | 7JYCpIzpoidDOnnmxmHwtj |          6 |
| Rank6 | 0mmFibEg5NuULMwTVN2tRU |          6 |
| Rank7 | 118GQ70Sp6pMqn6w1oKuki |          7 |
| Rank7 | 6S7cr72a7a8RVAXzDCRj6m |          7 |
```

chaining command-line commands

`;` links commands together and runs sequentially

```
csvlook SpotifyData_All.csv; csvstat SpotifyData_All.csv
```

`&&` links commands together, but only runs the 2nd command if the 1st succeeds

```
csvlook SpotifyData_All.csv && csvstat SpotifyData_All data.csv
```

chaining command-line commands

`>` re-directs the output from the 1st command to the location indicated as the 2nd

```
in2csv SpotifyData.xlsx > SpotifyData.csv
```

chaining command-line commands

`|` uses the output of the 1st command as input to the 2nd

Example:

Output of `csvcut` is not well formatted:

```
csvcut -c "track_id","danceability" Spotify_MusicAttributes.csv
```

```
track_id,danceability
118GQ7OSp6pMqn6w1oKuki,0.787
6S7cr72a7a8RVAXzDCRj6m,0.777
7h2qWpMJzIVtiP3OE8VDW4,0.795
3KVQFxJ5CWOcbxdpPYdi4o,0.815
```

chaining command-line commands

Example (continued):

Re-format `csvcut` 's output by piping the output as input to `csvlook` :

```
csvcut -c "track_id","danceability"  Spotify_Popularity.csv | csvlook
```

```
| track_id               | danceability |
| ---------------------- | ------------ |
| 118GQ70Sp6pMqn6w1oKuki |        0.787 |
| 6S7cr72a7a8RVAXzDCRj6m |        0.777 |
| 7h2qWpMJzIVtiP30E8VDW4 |        0.796 |
| 3KVQFxJ5CWOcbxdpPYdi4o |        0.815 |
```

Let's put everything together!

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