

Zubick's Scrap App

KWLUG Presentation

by John Driezen

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Zubick's Scrap App

An application program to track scrap metal purchase prices and plot graphs showing price trends over time for various commodities.

Written with:

- Python 3.8.10
- Sqlite3 v2.8.17
- GTK+ 3 v3.24.20
- python3-plotly
- python3-matplotlib v3.1.2 (Matplotlib)
- python3-bs4 v4.8.2-1 (Beautiful Soup)
- python3-lxml v4.5.0-1 (lxml parser)

Examples of Scrap Metal

Typical items that I have scrapped and sold in the past.

Old Barbecues



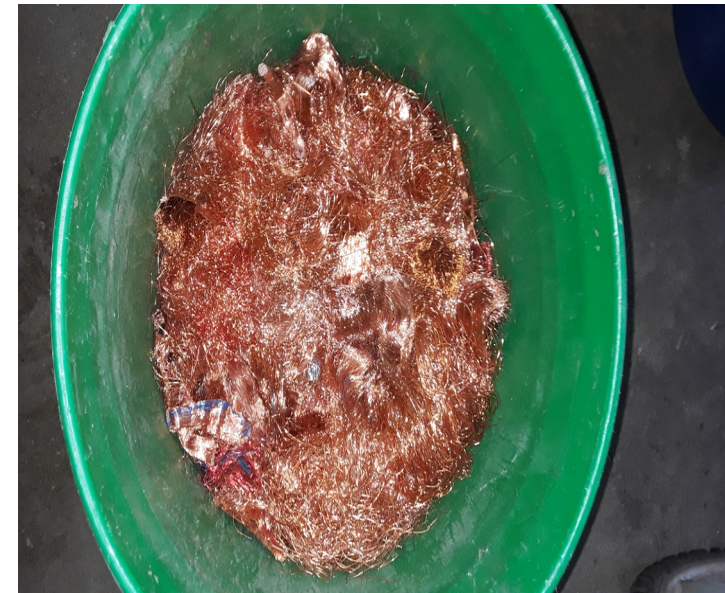
Scrap Yard Commodities: Cast Aluminum, Tin/Iron Sheeting

Copper Wire



Scrap Yard Commodities: #1 Bright Copper

Wall Wart Power Supplies



Scrap Yard Commodities: Tin/Iron Sheeting, #2 Copper

Chandelier



Scrap Yard Commodities: #2 Insulated Wire (DWL), Yellow Brass

Cast Iron Sump Pump



Scrap Yard Commodities: #2 Copper, Cast Iron/Encast

Brake Rotors & Drums



Scrap Yard Commodities: Auto Cast

Ford Taurus Transmission



Scrap Yard Commodities: Dirty Transmissions

GMC TH350C Transmission



Scrap Yard Commodities: Short Steel, Cast Aluminum

K Car Transmission Housing



Scrap Yard Commodities: Cast Aluminum, Steel

Why bother tracking prices?

- Small time scrappers are price takers
- Want the best possible purchase price for time invested in disassembling and sorting scrap metal

Scrap Yards Publish Prices

- In 2017, scrap yards started to publish their purchase prices online
- Examples:

John Zubick Limited in London, Ontario

<http://www.zubicks.com/prices/>

London Salvage & Trading in London, Ontario

<https://www.londonsalvage.com/prices/>

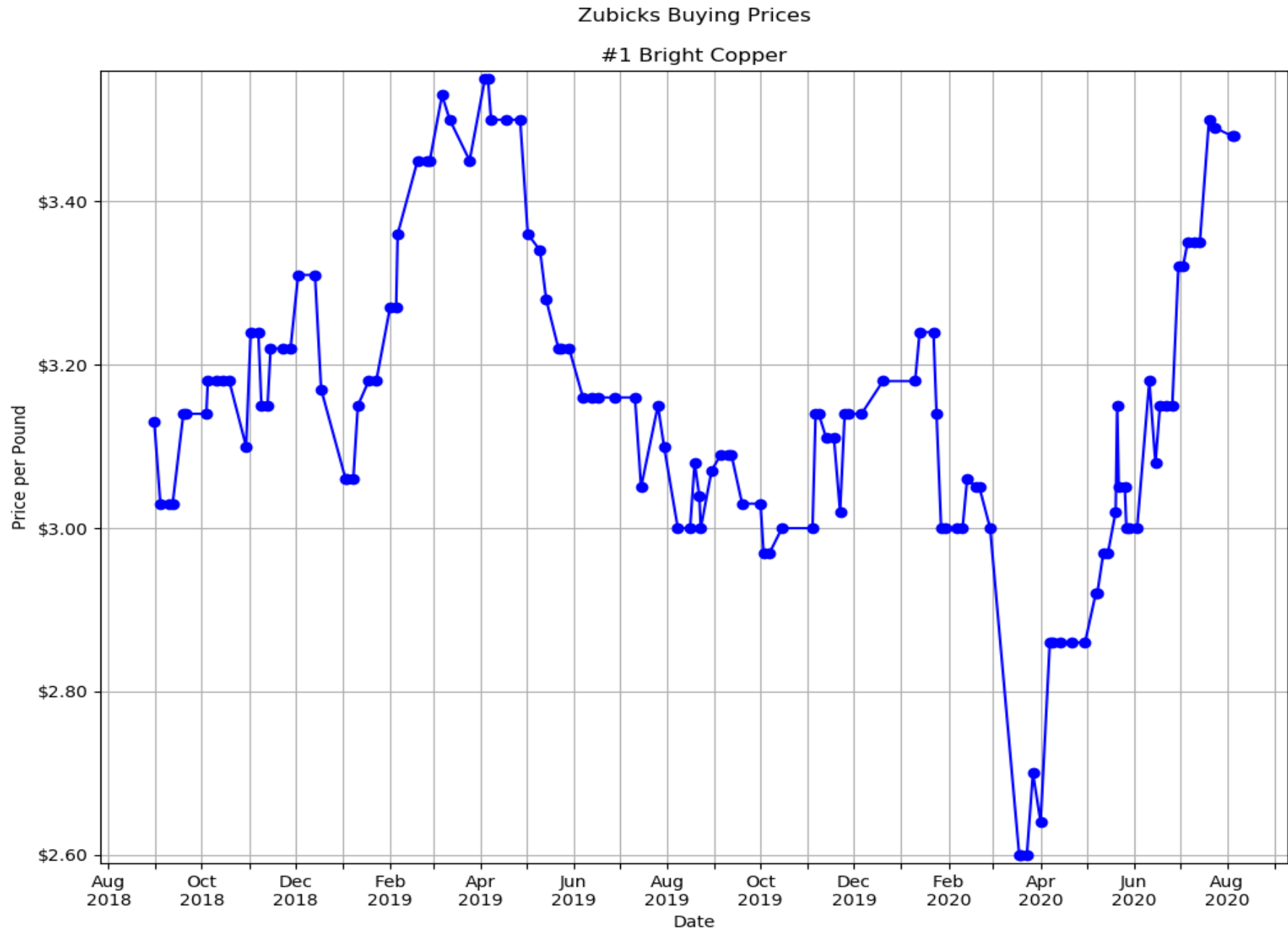
Benmet Steel & Metal in Guelph & Stratford, Ontario

https://www.benmetsteel.com/?page_id=7207

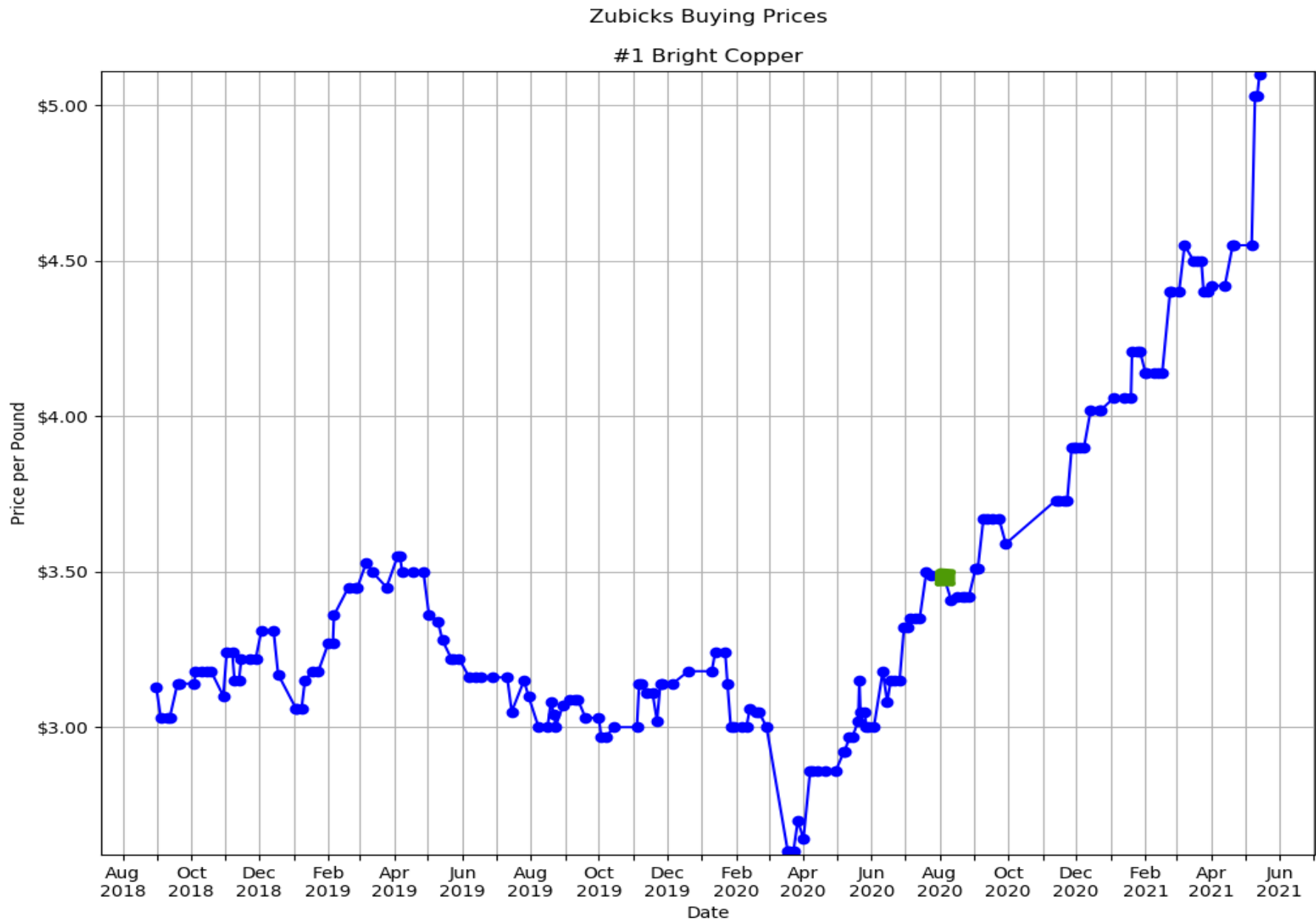
Scrap Yards Publish Prices

- If I could scrape the price data from the web page and dump the prices into a database, then I could plot a graph showing price trends over time
- Gives the scrapper the ability to judge when to sell their scrap metal

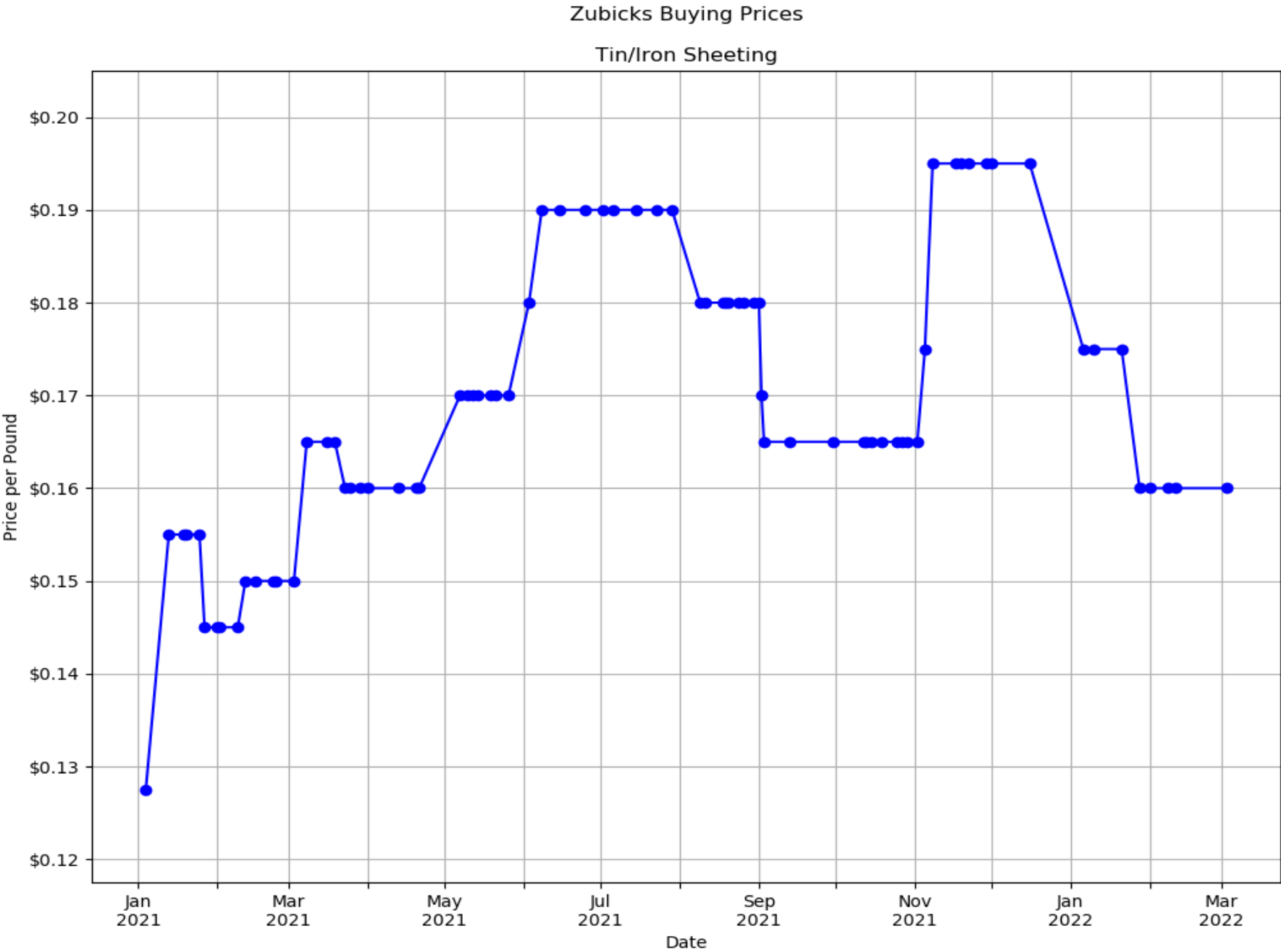
Scrap Copper Price on August 8, 2020



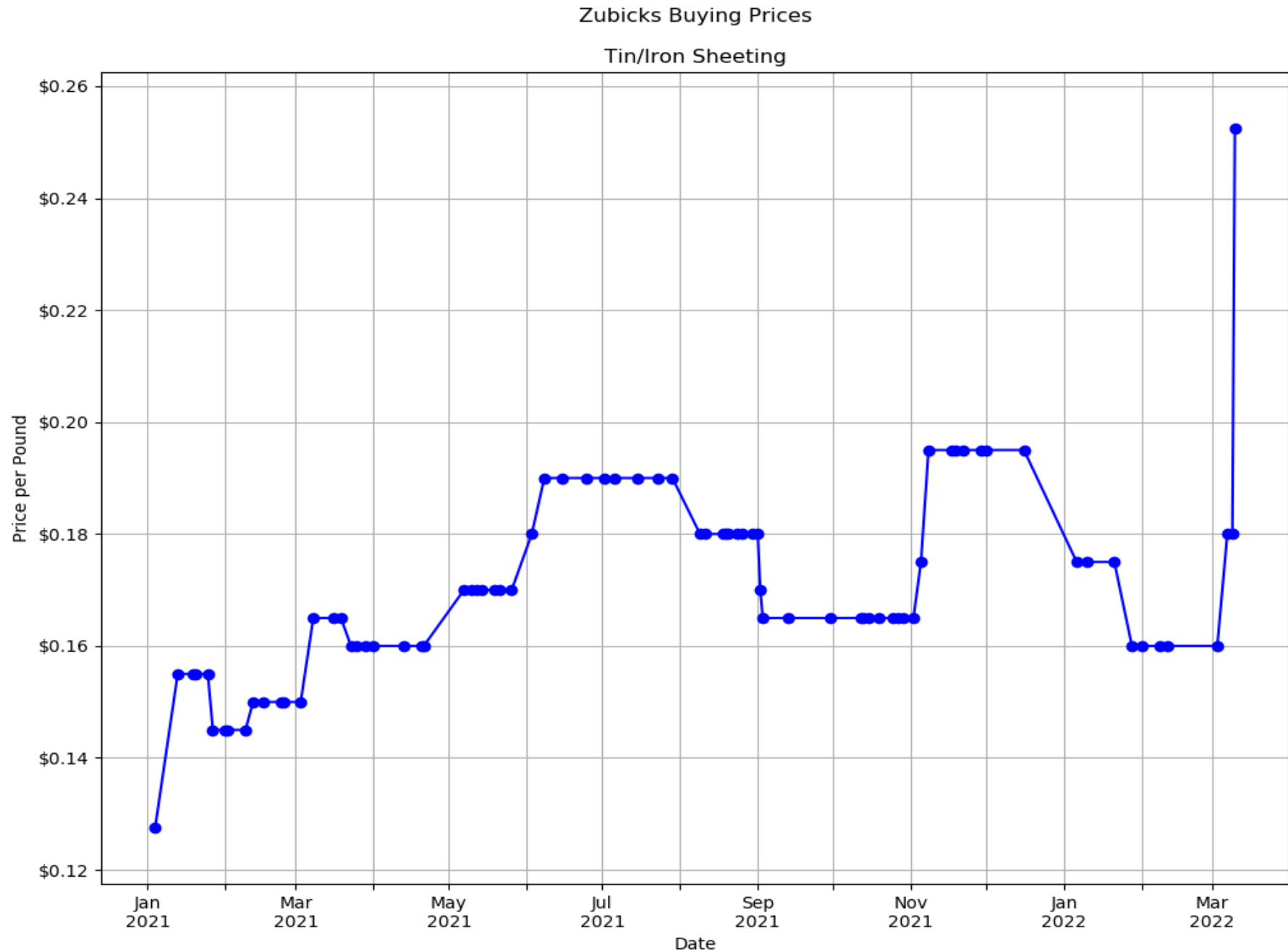
Scrap Copper Price on May 15, 2021



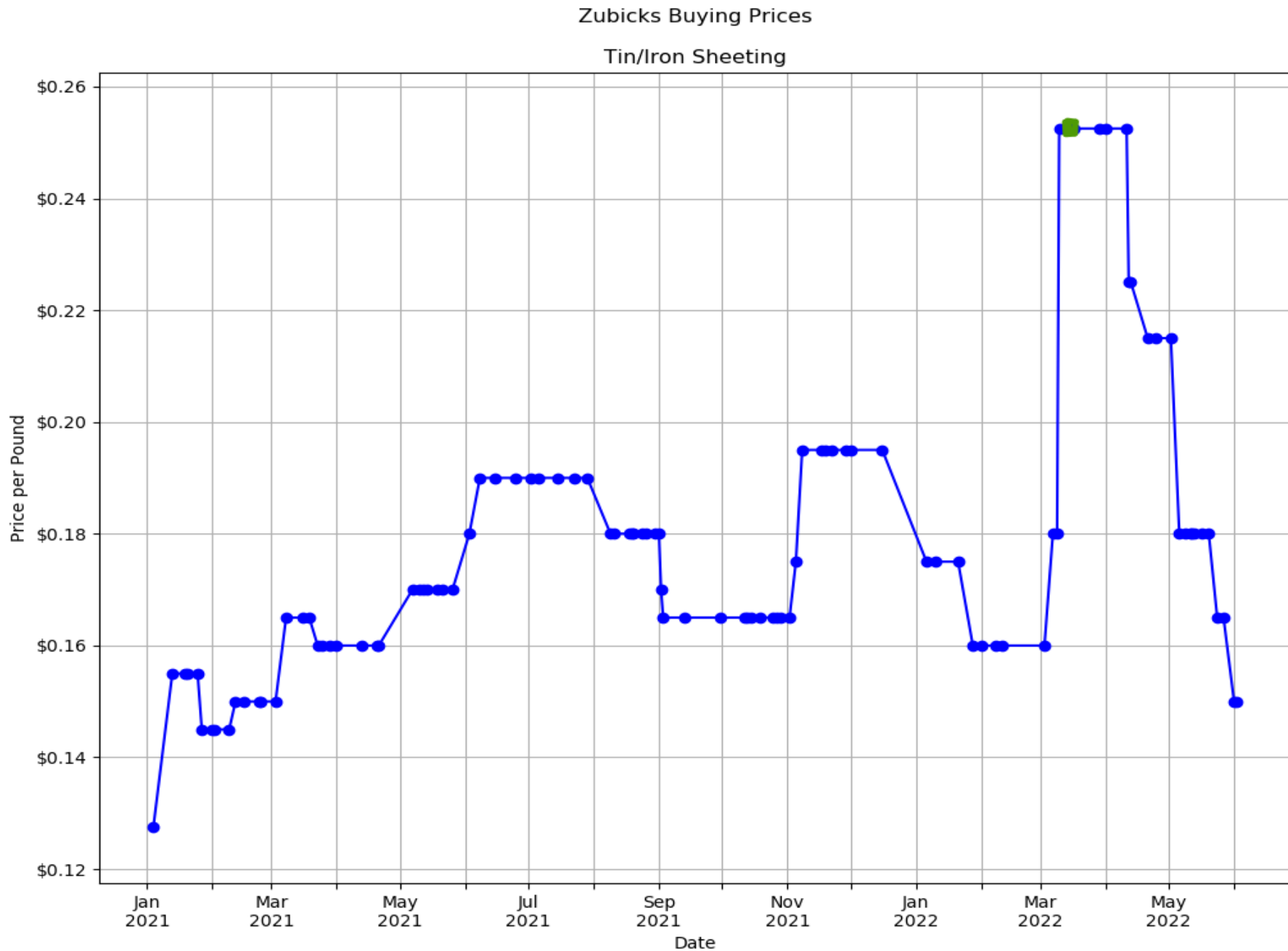
Scrap Tin/Iron Sheeting Price March 4, 2022



Scrap Tin/Iron Sheeting Price March 11, 2022



Scrap Tin/Iron Sheeting Price June 2, 2022



Program #1: zubicks_scraper.py

- Retrieves the web page from <http://www.zubicks.com/prices/>
- Parses web page using BeautifulSoup python library
- Stores materials and prices in an sqlite database
- Uses a single database table for simplicity
- Converts all quantities to pounds on data import

Program #2: Plotgraph.py

- Plots graph of prices over time using plotly
- Displays the plot in a web browser
- Saving an image of plot was doable with orca (<https://plotly.com/python/orca-management/>) but painful
- Orca is a large 50MB ApplImage executable

Program #3:

Plotgraphv2.py

- Plots a graph of prices over time using the python3-matplotlib library
- Matplotlib allows zooming in on the graph, as well as saving an image of the graph in .png format

Program #4:

ZubicksPriceBrowser.py

- Plotting a graph is nice, but now I wanted a GUI
- Learned some GTK+ 3 programming from tutorials at <https://python-gtk-3-tutorial.readthedocs.io/en/latest/>
- Purchased the book Foundations of PyGTK Programming GUI Creation with Python from amazon.ca <https://www.amazon.ca/Foundation-PyGTK-Development-Creation-Python/dp/1484241789>
- Displays a list of prices in a scrolled window
- Sorts lists of prices by date

Program #5:

ZubicksPriceBrowserv2.py

- Displays a list of prices in a scrolled window
- Sorts lists of prices by date and material
- Wrote custom cell renderers to display price and date in a more readable form

Program #6:

ZSALayoutDemo.py

- Selects scrap yard and material from a list
- Update prices by pressing a button
- Select date ranges by pressing a button
- Plot graph of prices by pressing a button

Putting It All Together

Program #7:

ZubicksScrapApp.py

- Combines the `zubicks_scraper.py`, `Plotgraphv2.py`, `ZubicksPriceBrowserv2.py`, and `ZSALayoutDemo.py` into a single application
- Adds new records to the scrolled window
- Filters the data in the scrolled window based on the user selections of Scrap Yard and Material (Date Range filter has not been written yet)
- Price data has been collected since August 30, 2018

Bugs in ZubicksScrapApp

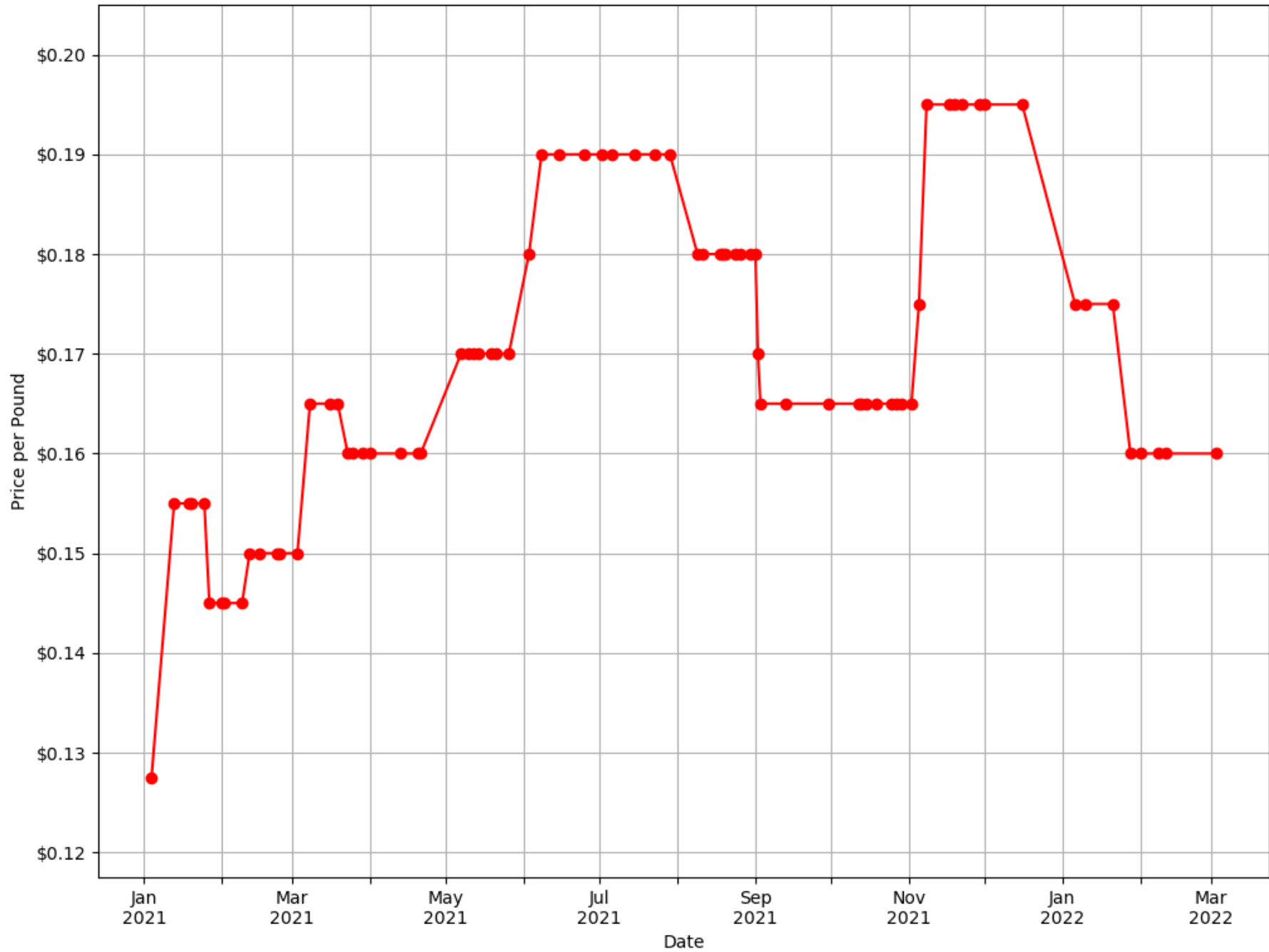
- Certain values for prices display incorrectly (29¢, 57¢, 58¢ show as 29.00¢, 57.00¢ and 58.00¢ cents respectively)
- Uses more storage space than needed (not a relational database model)
- Loads entire database into memory when application starts
- Maximizing the window blows up the buttons

Bugs in ZubicksScrapApp

- Graphs show prices varying linearly between data points but prices are constant between data points
- Need a step graph for time series data but none is available in matplotlib

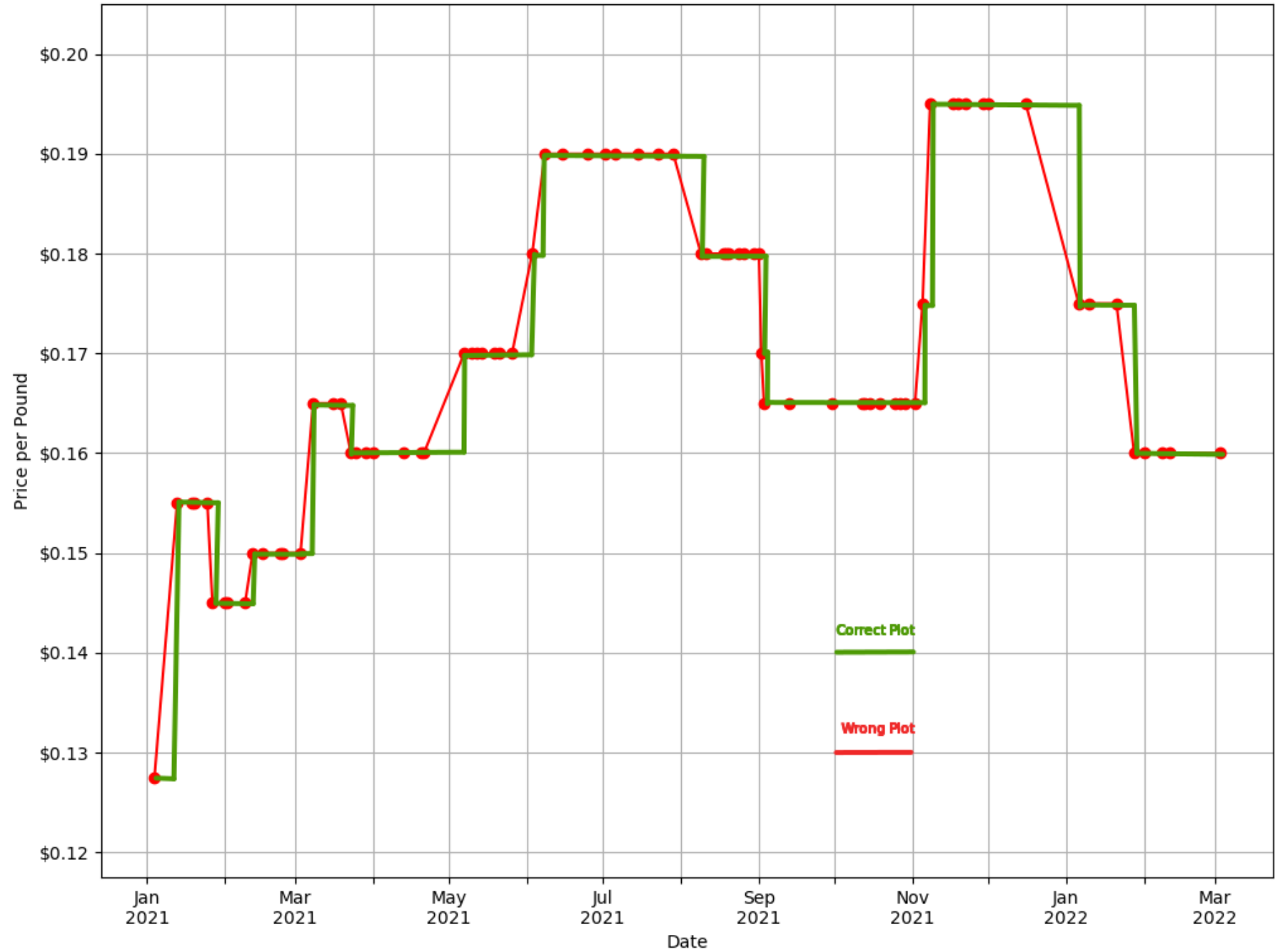
Zubicks Buying Prices

Tin/Iron Sheetting



Zubicks Buying Prices

Tin/Iron Sheet



Roadmap for Zubick's Scrap App

- Write date range filter function to filter records in the scrolled window by date range selected
- Add column for price change since last update
- Add mass conversion window in Tools Menu to convert between pounds, kilograms, net tons and metric tons
- Add support for multiple scrap yards by writing more scrapers and changing SQL queries
- Add user defined custom date range where dates are selected from a calendar

Roadmap for Zubick's Scrap App

- Pipe Dreams:
 - 1) Convert the single database table to a relational database model (requires rewriting all SQL queries and most of the code)
 - 2) Update to python3.10, allowing use of case statements to make code cleaner
 - 3) Convert to GTK 4, but documentation and python examples are scarce

Questions?