

Exercise 2 – Stocks service

Objective

Practice working with open source libraries, process creation, signals and inter process communication using pipes.

Overview

Write an interactive program that retrieves stocks info from the internet, stores them locally and displays specific information upon request.

Detailed description

The program shall receive the following options:

- 1) Fetch, process and store(**in memory**) specific stock data from the internet
- 2) List available stocks
- 3) Print specific stock data(same as in exercise #1)
- 4) Write all data to files in **CSV** format and zip them(override if exists)

The program shall be divided into 2 processes:

- 1) Main – Shall fork “Worker” on init, and handle user input and output. When user chooses options 1, 2 or 3, the request should be passed to the “Worker” and result data shall be received from the “Worker” using a shared **pipe**, option 4 shall trigger a signal(SIGUSR1) upon which the “Worker” will zip the data.
- 2) Worker – Shall wait on the pipe and receive op-codes(operations) from “Main”, perform the required operation and return the data to the pipe

Note: For zipping & unzipping use libzip(it is forbidden to use zip command line), for parsing JSON use <https://github.com/json-c/json-c>,

Note 2: upon receiving CTRL+C(SIGINT) zip files shall be created like in option 4, the main process shall behave in the same way as in option 4(SIGUSR1 to “Worker”)

Note 3: on init existing zipped data shall be unzipped and loaded to the “Worker” memory

Submission

Zip all files together (only source files(.c, .h, Makfile), no binaries/shared libraries/output files(.o, .out, .so, etc...)).

Add README file inside the zip with the names, IDs, and notes(if needed).

Examples

Common flow

```
gabi@ubuntu-lp:~/exercise2$ ./stocks.out
1 - Fetch stock data
2 - List fetched sotcks
3 - Print stock data
4 - Save all stocks data
Make your choce(1/2/3/4): 2
Available stocks: AAPL MSFT AMZN
=====

1 - Fetch stock data
2 - List fetched sotcks
3 - Print stock data
4 - Save all stocks data
Make your choce(1/2/3/4): 1
Type stock name: GOOGL
Fetch GOOGL DONE
=====

1 - Fetch stock data
2 - List fetched sotcks
3 - Print stock data
4 - Save all stocks data
Make your choce(1/2/3/4): 3
Type stock name: GOOGL
Time: 2022-04-04, Open: 2790.0000, High: 2874.2400, Low: 2766.1500, Close: 2859.4300, Volume: 2595614, EPS: 0
Time: 2022-03-31, Open: 2697.5700, High: 2875.8700, Low: 2505.5000, Close: 2781.3500, Volume: 36383218, EPS: 0
Time: 2022-02-28, Open: 2751.8900, High: 3030.9315, Low: 2499.0650, Close: 2701.1400, Volume: 46381207, EPS: 0
Time: 2022-01-31, Open: 2901.1000, High: 2929.6978, Low: 2490.0000, Close: 2706.0700, Volume: 38092594, EPS: 0
Time: 2021-12-31, Open: 2880.0000, High: 2982.0000, Low: 2786.4200, Close: 2897.0400, Volume: 30992881, EPS: 112.23
Time: 2021-11-30, Open: 2960.9200, High: 3019.3300, Low: 2832.0300, Close: 2837.9500, Volume: 30278875, EPS: 112.23
Time: 2021-11-30, Open: 2960.9200, High: 3019.3300, Low: 2832.0300, Close: 2837.9500, Volume: 30278875, EPS: 112.23
Time: 2021-10-29, Open: 2688.9500, High: 2973.0000, Low: 2621.0000, Close: 2960.9200, Volume: 36040000, EPS: 112.23
Time: 2021-09-30, Open: 2900.0000, High: 2925.0750, Low: 2671.1200, Close: 2673.5200, Volume: 29545719, EPS: 112.23
Time: 2021-08-31, Open: 2702.3400, High: 2919.4100, Low: 2666.3900, Close: 2893.9500, Volume: 23041294, EPS: 112.23
Time: 2021-07-30, Open: 2434.5000, High: 2765.9400, Low: 2430.6300, Close: 2694.5300, Volume: 30452492, EPS: 112.23
Time: 2021-06-30, Open: 2374.4400, High: 2461.9100, Low: 2329.5200, Close: 2441.7900, Volume: 27241174, EPS: 112.23
Time: 2021-05-28, Open: 2364.9100, High: 2389.0500, Low: 2193.6200, Close: 2356.8500, Volume: 30175239, EPS: 112.23
Time: 2021-04-30, Open: 2092.2500, High: 2431.3800, Low: 2091.4300, Close: 2353.5000, Volume: 35119920, EPS: 112.23
Time: 2021-03-31, Open: 2048.0000, High: 2113.7400, Low: 1994.0000, Close: 2062.5200, Volume: 37837953, EPS: 112.23
Time: 2021-02-26, Open: 1844.5850, High: 2145.1400, Low: 1844.5850, Close: 2021.9100, Volume: 33609952, EPS: 112.23
Time: 2021-01-29, Open: 1760.0000, High: 1932.0800, Low: 1696.1014, Close: 1827.3600, Volume: 39569373, EPS: 112.23
Time: 2020-12-31, Open: 1766.6550, High: 1843.8300, Low: 1694.0000, Close: 1752.6400, Volume: 30424255, EPS: 58.7
Time: 2020-11-30, Open: 1623.5400, High: 1816.8900, Low: 1612.1080, Close: 1754.4000, Volume: 31560329, EPS: 58.7
=====

1 - Fetch stock data
2 - List fetched sotcks
3 - Print stock data
4 - Save all stocks data
Make your choce(1/2/3/4): 4
Data saved in /home/gabi/exercise2/stocks_db.zip
=====
```

CTRL+C

```
gabi@ubuntu-lp:~/exercise2$ ./stocks.out
1 - Fetch stock data
2 - List fetched sotcks
3 - Print stock data
4 - Save all stocks data
Make your choce(1/2/3/4): ^C
CTRL+C caught, creating database zip and exiting...
```

```
gabi@ubuntu-lp:~/exercise2$ zip -sf stocks_db.zip
Archive contains:
  AAPL.data
  AMZN.data
  GOOGL.data
  MSFT.data
Total 4 entries (73978 bytes)
```