ActiveViam VaR Programming Exercise

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Enclosed is a GUI application that can calculate VAR for both a single trade and a portfolio of trades. The application was written in Java, as well as Python. Each language's executable files are found in their respective folders.

Note that portfolio-level VAR is calculated here assuming there is no correlation or covariance between trades.

Additionally, both calculations assume a discrete uniform distribution for the P&L vector. This means that the percentile calculations round down to the nearest discrete P&L value for a corresponding confidence value, rather than interpolate. While there are many ways to calculate percentiles, I chose this, as it is the simplest and most transparent method.

Executables and source code files are enclosed in both Java and Python.

Running the Application

Java

An executable .JAR file is provided in the enclosed "Java" folder that will automatically run through Terminal (Unix/Mac) or CMD (Windows) by typing "java -jar VarCalculatorJava.jar".

This is assuming you are already in the correct directory. If not, you can use "cd /your filepath here/" to change to the right path. Note that Java must installed on your computer. If not, it can be downloaded here.

Finally, the app can be run by opening the enclosed VaRCalculatorGUI.java file an IDE such as Eclipse and running it from there.

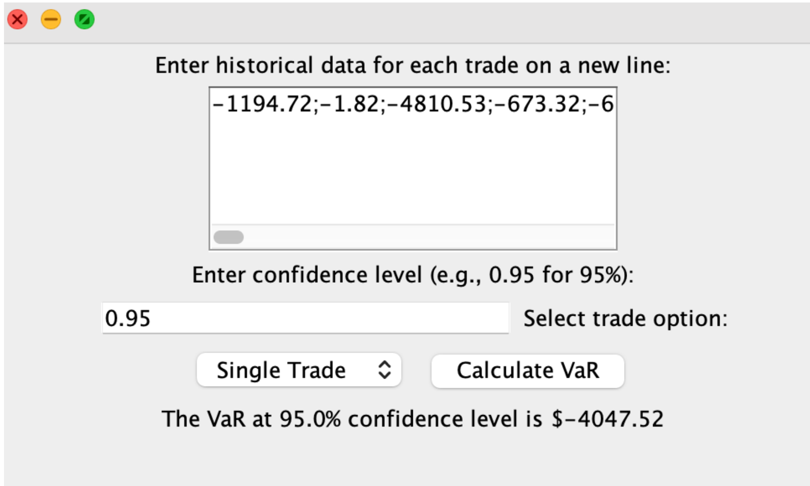
Python

As above, the .py file is provided in the enclosed "Python" folder that can run through Terminal (Unix/Mac) or CMD (Windows) by typing "python jar_calculator.py". Once again Python needs to be installed here.

As above, the directory must be changed to run. The app can also be run through the "var_calculator.ipynb" file in Jupyter Notebook, while the "var_calculator.py" file can be run in any other python IDE such as Spyder.

Instructions for Use

The application works the same way, regardless of whether you run the Python or Java Versions (see below).



Users can choose whether to calculate VAR on a single trade, with the P&L vector entered in one semicolon delimited line, in the same format as the given sample file. Similarly, VAR at the portfolio level is calculated with each semicolon delimited P&L vector entered on a different line, once again, pasting in multiple trade vectors from the given sample file.

The application has automatic checks to handle any errors in input format, including entering trade-level data with the portfolio level setting selected and vice versa, along with data validation for confidence intervals.