

# Time series data forecast using ARIMA model

## Overview

This is a program to conduct financial time series data forecasting using ARIMA predictive statistics model. This program will use the the financial time series data that user selects to fit a proper ARIMA model and use the corresponding model to conduct the forecasting.

## Brief introduction of ARIMA model

In statistics and econometrics, and in particular in time series analysis, an autoregressive integrated moving average (ARIMA) model is a generalization of an autoregressive moving average (ARMA) model. These models are fitted to time series data either to better understand the data or to predict future points in the series (forecasting).

## Dataset in the program

This program utilize the package of Yahoo Finance to import the real-time financial data through the supported API of the website of Yahoo Finance. User only need to type the ticker symbol of the stock and the time period he/she is interested in.

## Packages

pandas  
yahoo-finance  
scikits.statsmodels  
statsmodels  
patsy  
Pillow

## **User guide / Process of this program**

### **Step 0 - Run program**

Put all the files in your working directory. Run the main.py file using Python. Remember to install all the required package before you run the program.

### **Step 1 - User Input**

There would be a Graphical User Interface where user can directly input the ticker symbol of the stock he/she is interested in. Then input the start date and the end date of the interested data.

### **Step 2 - Select parameters of ARIMA model**

Plot the log of the data. Plot ACFs, and PACFs which are necessary for selecting proper parameter (d) of the model. Calculate the AICC of models with all possible values of parameters (p) and (q). The model with the lowest AICC is the best fit for the data.

### **Step 3 - Predicting and plotting**

Plot the line graph of the original financial time series data and also the line graph whose data is predicted based on the original historical data using corresponding ARIMA model.