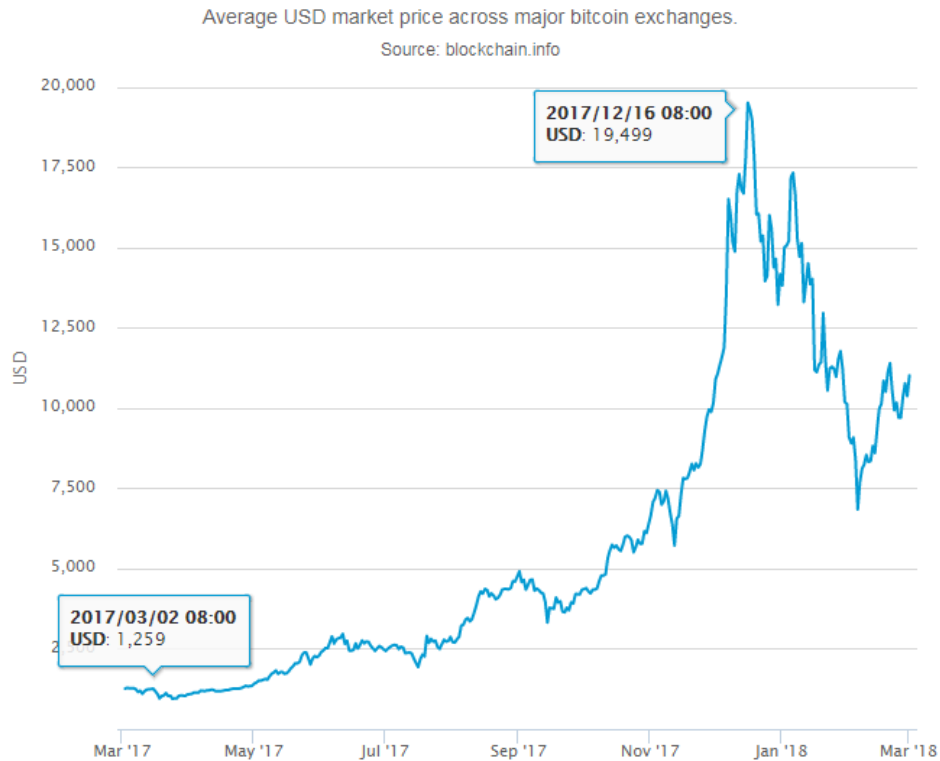


STAT3612 Assignment 1: Bitcoin Prices

Date: March 2, 2018

Submit via Moodle on or before March 15, 2018.



The bitcoin prices have been increasing in the past year but also encountered dramatic drops from the peak price at 16 December last year. In this assignment, you are directed to perform the trend analysis of daily bitcoin prices based on STAT3612 modeling methods.

Step 1. (20%) Download the historical daily bitcoin prices for the last year from <https://blockchain.info/charts/market-price>; You may also get a copy of data from the course website: `BitCoin.csv`. Then reproduce the above chart in R or Python, together with a smooth curve fitting by `ggplot2 geom_smooth` object.

Step 2. (20%) Perform a linear regression fitting for the last year historical prices. Report

SSE and goodness-of-fit statistic.

Step 3. (20%) Perform the broken stick regression with break point at 16 December 2017. Report SSE.

Step 4. (20%) Perform the broken stick regression with automatic selection of optimal break point. Report the optimized SSE.

Step 5. (20%) Perform a piecewise linear fitting with three knots at 12 November 2017, 16 December 2017 and 5 February 2018. Report SSE.

Step 6. (Bonus 20%) Develop an automatic algorithm for piecewise linear fitting with optimal choices of three knots.